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NATIONAL BUREAU OF STANDARDS

NATIONAL DIRECTORY OF COMMODITY SPECIFICATIONS

Superseding Miscellaneous Publication M130

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NATIONAL BUREAU OF STANDARDS MISCELLANEOUS PUBLICATION M178

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NATIONAL DIRECTORY OF COMMODITY SPECIFICATIONS

CLASSIFIED AND ALPHABETICAL LISTS AND BRIEF DESCRIPTIONS OF SPECIFICATIONS OF NATIONAL RECOGNITION

Prepared by Paul A. Cooley and Ann E. Rapuzzi
under the direction of A. S. McAllister
Chief of the Division of Codes and Specifications

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Foreword

The usefulness of the many commodity specifications in existence is greatly increased if there is a convenient means for locating and comparing them. Situations frequently arise in which a need develops for determining what specifications exist and how they apply.

The National Directory of Commodity Specifications provides a place for recording all specifications of national significance. In previous editions, it has been widely used by governmental agencies and by private organizations. In response to a demand from war agencies and other organizations, it has been completely revised and brought up to date. Although every effort has been made to assure completeness and accuracy, it is realized that improvements may be desirable in future editions. All recommendations that are received will be given very careful consideration.

Lyman J. Briggs, *Director.*

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S.L.

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Introduction

This publication is a third edition of the National Directory of Commodity Specifications, published first in 1925, and in revised and enlarged form in 1932. In it will be found listed and briefly described the standards and specifications of trade associations, technical societies, and organizations that are representative in a national way of industry or some branch of industry, as well as the standards and specifications of governmental agencies that represent the Federal Government as a whole. Included also are references to the purchase specifications of several departments and establishments of the Federal Government.

As in the previous editions, the decimal system of classification of commodities is used, some minor changes and additions having been made to take care of new material.

The classification system adopted in the Directory tends to group specifications and standards relating to the same subjects, so that specification-making bodies may take note of, or be forewarned concerning duplication of material. Moreover, a special effort has been made to increase the value of the Directory to the purchaser who desires to employ nationally-recognized specifications. For example, if the use of a commodity is not self-evident from the title of the specification, a brief explanation has been given when possible. A summary of each specification is also included so that the reader may to some extent judge for himself whether the scope of the specification fits his particular needs. Cross-referencing serves to tie up related specifications.

To obtain maximum service from the Directory, full use should be made of the index on pages 1185 to 1311. Here the commodities are listed alphabetically and references are given to the classification groups in the body of the Directory in which the specifications for the particular commodities appear. Directions for obtaining copies of the specifications will be found on page 1162.

Notwithstanding the fact that some of the specifications listed in the Directory will become obsolete in a relatively short time because revised specifications have superseded them, the Directory will lead to up-to-date information if properly utilized. When an issuing agency receives an order for a specification referred to in the Directory, it will supply its current specification unless specifically requested to deliver the one that has been superseded.

CLASSIFIED LIST OF SPECIFICATIONS

000-099 ANIMALS AND ANIMAL PRODUCTS

(Except Wool and Hair)

000-009 ANIMALS

001. CATTLE

001.1 MILK COWS

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications No. 12 for Cattle, Dairy and Beef. Includes dairy bulls, registered or purebred; dairy cows, registered or purebred; grade dairy cows; beef bulls, registered or purebred; beef cows, registered or purebred; grade beef cows.

001.2 BEEF CATTLE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Circular 28; 1928. Revised, 1942. Market Classes and Grades of Calves and Vealers. Covers vealers and calves differentiated, definition of terms; and schedule, classes, weight, grades, and grade description of vealers, slaughter calves, and stocker and feeder calves.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Circular 505; 1938. Market Classes and Grades of Feeder and Stocker cattle. Covers feeder and stocker cattle, definitions of terms and classifications for feeder and stocker cattle (classes of feeder and stocker cattle, age selections of feeder and stocker cattle, use selections, and weight selections), grade factors for feeder and stocker cattle, feeder and stocker cattle classification and grades, standards for grades of feeder and stocker steers, heifers, and cows (grades of feeder and stocker steers, grades of feeder and stocker heifers, and grades of feeder and stocker cows).

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Dept. Bulletin 1464; 1927. Revised, 1940. Market Classes and Grades of Cattle. Covers systems of standard market classes and grades of livestock, basis for standard market classes and grades of cattle, classifying and grading cattle, market uses of cattle, and detailed information concerning slaughter cattle and feeder and stocker cattle.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 112. Official U. S. Standards for Grades of Slaughter Cattle, effective July 16, 1928, and Amendment 1, issued July 1939. Gives definitions of terms, classes (steer, heifer, cow, bull, and stag); grades for steers and heifers (prime or No. A-1, choice or No. 1, good or No. 2, medium or No. 3, common or No. 4, cutter or No. 5, and canner or No. 6); grades for cows, bulls, and stags (choice or No. 1, good or No. 2, medium or No. 3, common or No. 4, cutter or No. 5, and canner or No. 6).

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 113. U. S. Standards for Grades of Vealers and Slaughter Calves, effective July 16, 1928. Gives definitions of terms, market groups, classes (steer, heifer, bull), and specifications for grades—prime or No. A-1, choice or No. 1, good or No. 2, medium or No. 3, common or No. 4, and cull or No. 5.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications No. 12 for Cattle, Dairy and Beef. Includes dairy bulls, registered or purebred; dairy cows, registered or purebred; grade dairy cows; beef bulls, registered or purebred; beef cows, registered or purebred; grade beef cows.

002. HOGS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Circular 569; 1940. Market Classes and Grades of Swine. Covers introduction, development of market classes and grades of swine, classifying and grading, benefits of classifying and grading, definitions of terms and classifications for swine (swine, use selections, classes of swine, and weight selections), grade (grade factors for swine), type, slaughter hogs (slaughter hog schedule, grades of slaughter barrows and gilts, and grades of slaughter sows), slaughter pigs (classes of slaughter pigs, slaughter pig schedule, and grades of slaughter pigs), feeder and stocker swine (classes of feeder and stocker swine, feeder and stocker swine schedule, and grades of feeder and stocker barrows and gilts).

003. SHEEP

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Circular 383. Revised, July 1940. Market Classes and Grades of Lambs and Sheep. Covers need for standardization, classifying and grading, definitions and descriptions of market groups, grade factors (conformation, finish, and quality), factors affecting value (weight, excessive finish, and carcass yield), lambs, lamb schedule (grades of slaughter lambs), sheep, sheep schedule (grades of slaughter sheep and grades of feeder sheep and lambs).

004. HORSES

004.1 WORK HORSES

005. MULES, ASSES, AND BURROS

005.1 MULES

005.2 ASSES

005.3 BURROS

007. POULTRY

007.0 GENERAL ITEMS

U. S. Gov., Federal Specification LL-P-631; 1932. Poultry; Live. Covers chickens—broilers, fryers, and roasters; fowl—heavy and light; ducks; geese; and turkeys. Includes all breeds of chicken or fowl and turkeys, all breeds of ducks except Moscovies and Indian Runners, and all breeds of geese except Chinese or Swan geese. Gives detail requirements; methods of inspection; and requirements for packaging, packing, and marking.

007.1 CHICKENS AND FOWLS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Live Poultry, 1944. Includes requirements for chickens (broilers, fryers, roasters, capons, stags, fowl, and cocks—old roosters). Covers standards for individual birds, U. S. No. 1, U. S. No. 2, and rejects; and wholesale grades for live poultry, U. S. No. 1, U. S. No. 2, and no grade. Gives requirements for each kind of chicken, explanation of terms, and summary for individual birds.

U. S. Gov., Federal Specification LL-P-631; 1932. Poultry; Live. Covers chickens—broilers, fryers, and roasters; fowl—heavy and light; ducks; geese; and turkeys. Includes all breeds of chicken or fowl and turkeys; all breeds of ducks except Moscovies and Indian Runners, and all breeds of geese except Chinese or Swan geese. Gives detail requirements; methods of inspection; and requirements for packaging, packing, and marking.

007.2 TURKEYS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Live Poultry, 1944. Includes requirements for turkeys (young hens, young toms, old hens, old toms). Covers standards for individual birds, U. S. No. 1, U. S. No. 2, and rejects; and wholesale grades for live poultry, U. S. No. 1, U. S. No. 2, and no grade. Gives requirements for each kind of turkey, explanation of terms, and summary for individual birds.

U. S. Gov., Federal Specification LL-P-631; 1932. Poultry; Live. Covers chickens—broilers, fryers, and roasters; fowl—heavy and light; ducks; geese; and turkeys. Includes all breeds of chicken or fowl and turkeys, all breeds of ducks except Moscovies and Indian Runners, and all breeds of geese except Chinese or Swan geese. Gives detail requirements; methods of inspection; and requirements for packaging, packing, and marking.

007.3 DUCKS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Live Poultry, 1944. Includes requirements for ducks (young ducks and old ducks). Covers standards for individual birds, U. S. No. 1, U. S. No. 2, and rejects; and wholesale grades for live poultry, U. S. No. 1, U. S. No. 2, and no grade. Gives requirements for young and old ducks, explanation of terms, and summary for individual birds.

U. S. Gov., Federal Specification LL-P-631; 1932. Poultry; Live. Covers chickens—broilers, fryers, and roasters; fowl—heavy and light; ducks; geese; and turkeys. Includes all breeds of chicken or fowl and turkeys, all breeds of ducks except Moscovies and Indian Runners, and all breeds of geese except Chinese or Swan geese. Gives detail requirements; methods of inspection; and requirements for packaging, packing, and marking.

007.4 GEESE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Live Poultry, 1944. Includes requirements for geese. Covers standards for individual birds, U. S. No. 1, U. S. No. 2, and rejects; and wholesale grades for live poultry, U. S. No. 1, U. S. No. 2, and no grade. Gives explanation of terms and summary for individual birds.

U. S. Gov., Federal Specification LL-P-631; 1932. Poultry; Live. Covers chickens—broilers, fryers, and roasters; fowl—heavy and light; ducks; geese; and turkeys. Includes all breeds of chicken or fowl and turkeys, all breeds of ducks except Moscovies and Indian Runners, and all breeds of geese except Chinese or Swan geese. Gives detail requirements; methods of inspection; and requirements for packaging, packing, and marking.

007.5 PIGEONS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Live Poultry, 1944. Includes requirements for squabs and pigeons. Covers standards for individual birds, U. S. No. 1, U. S. No. 2, and rejects; and wholesale grades for live poultry, U. S. No. 1, U. S. No. 2, and no grade. Gives requirements for squabs and pigeons, explanation of terms, and summary for individual birds.

U. S. Gov., U. S. Army, Signal Corps. Specification 25-1; 1935. Pigeons; Homing.

007.6 GUINEAS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Live Poultry, 1944. Includes requirements for guineas (young guineas and old guineas). Covers standards for individual birds, U. S. No. 1, U. S. No. 2, and rejects; and wholesale grades for live poultry, U. S. No. 1, U. S. No. 2, and no grade. Gives requirements for young and old guineas, explanation of terms, and summary for individual birds.

010-019 MEATS

010. GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Meat. Preparation of sample, determination of moisture, ash, crude fat, total phosphorus, total nitrogen, preservatives, creatin, and tentative methods for determination of ammonia, nitrates, nitrites, starch, glycogen, sugar, metals, coloring matters, nitrogen in various combinations, meat bases, and soluble phosphorus.

011. BEEF AND VEAL

011.1 BEEF CARCASSES

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Circular 103; 1930. Revised, 1942. Market Classes and Grades of Dressed Veal and Calf Carcasses. Covers purposes of classifying and grading, definitions of class and grade, veal and calf carcasses differentiated (methods of dressing and weight selections), basis for grading veal and calf carcasses (conformation, finish, and quality), veal-carcass schedule (grades of veal carcasses), calf-carcass schedule (grades of calf carcasses), wholesale cuts of veal and calf carcasses (grades of wholesale cuts of veal and grades of wholesale cuts of calf carcasses), and kosher veal.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 99. Official U. S. Standards for Grades of Carcass Beef, reprinted with amendments, May 1942. Covers three classes: (1) Steer and heifer (seven grades—prime, choice, good, commercial, utility, cutter, and canner); (2) cow (five grades—good, commercial, utility, cutter, and canner); and (3) bull and stag (six grades—choice, good, commercial, utility, cutter, and canner).

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 114. Official U. S. Standards for Grades of Veal and Calf Carcasses, 1928, and Amendment 1, Oct. 1940. Gives definitions of terms, market groups, classes (steer, heifer, bull), and specifications for grades—prime or No. A-1, choice or No. 1, good or No. 2, commercial or No. 3, utility or No. 4, and cull or No. 5.

U. S. Gov., Federal Specification PP-B-221a; 1941. Amendment 4; 1942. Beef; Fresh. Covers four types—(I) fresh, chilled, carcass, (II) fresh, frozen, carcass, (III) fresh, chilled, wholesale market cuts, and (IV) fresh, frozen, wholesale market cuts; three classes—(1) steer, (2) heifer, and (3) cows; and five grades—(A) low choice, (B) high good, (C) low good, (D) high commercial, and (E) low commercial. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of analysis, food regulations, *see* 010; veal carcasses, *see* 011.8; beef and veal cuts, *see* 011.91.

011.2 BEEF HEARTS

U. S. Gov., Federal Specification PP-H-201; 1931. Amendment 1; 1940. Hearts; Beef. Covers one grade and two classes—(I) chilled and (II) frozen. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of analysis, food regulations, *see* 010.

011.3 BEEF KNUCKLES

011.4 BEEF AND VEAL LIVERS

U. S. Gov., Federal Specification PP-L-351; 1931. Amendment 2; 1940. Liver. Covers three classes—(A) calf, (B) beef, and (C) lamb; and two types—(I) chilled and (II) frozen. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010.

011.5 BEEF KIDNEYS

U. S. Gov., Federal Specification PP-K-351; 1931. Amendment 1; 1940. Kidneys; Beef. Covers one grade and two types—(I) chilled and (II) frozen. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010.

011.6 BEEF TONGUES

U. S. Gov., Federal Specifications PP-T-576; 1938. Tongues, Beef; Fresh, and Cured and Smoked. Covers two types—(I) fresh (chilled or frozen) and (II) cured and smoked; and two grades—(A) prime and (B) good. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned beef tongue, *see* 018.11.

011.7 OXTAILS

011.8 VEAL CARCASSES AND CUTS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Circular 103; 1930. Revised, 1942. Market Classes and Grades of Dressed Veal and Calf Carcasses. Covers purposes of classifying and grading, definitions of class and grade, veal and calf carcasses differentiated (methods of dressing and weight selections), basis for grading veal and calf carcasses (conformation, finish, and quality), veal-carcass schedule (grades of veal carcasses), calf-carcass schedule (grades of calf carcasses), wholesale cuts of veal and calf carcasses (grades of wholesale cuts of veal and grades of wholesale cuts of calf carcasses), and kosher veal.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 114. Official U. S. Standards for Grades of Veal and Calf Carcasses, 1928, and Amendment 1, Oct. 1940. Gives definitions of terms, market groups, classes (steer, heifer, bull), and specifications for grades—prime or No. A-1, choice or No. 1, good or No. 2, commercial or No. 3, utility or No. 4, and cull or No. 5.

U. S. Gov., Federal Specification PP-V-191a; 1935. Amendment 1; 1941. Veal. Covers two grades—(A-1) choice and (A) good; four types—(I) carcass or sides, fresh, chilled, (II) carcass or sides, fresh, frozen, (III) veal cuts, fresh, chilled, and (IV) veal cuts, fresh, frozen; and two classes—(1) light weight and (2) heavy weight. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010; fresh veal cuts, *see* 011.91.

011.9 MISCELLANEOUS SPECIFICATION FOR BEEF AND VEAL

011.91 Fresh Beef and Veal Cuts

References.—Other specifications for fresh beef and veal, *see* 011.1, 011.8; definitions, methods of analysis, food regulations, *see* 010.

011.92 Veal Sweetbreads

U. S. Gov., Federal Specification PP-S-871; 1932. Sweetbreads; Thymus-Glands. Covers one grade and class—derived from calf carcasses; and two types—fresh, chilled; fresh, frozen. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

011.93 Calf Brains

U. S. Gov., Federal Specification PP-B-656; 1932. Brains; Calf. Covers one grade and two types—fresh, chilled; and fresh, frozen. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

011.94 Smoked Beef and Veal

References.—Dried beef and veal, *see* 018.13.

011.95 Pickled Beef and Veal

References.—Definitions, methods of analysis, food regulations, *see* 010.

012. PORK, HAM, AND BACON

References.—Fresh pork cuts, *see* 012.91.

012.1 PORK CARCASSES

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Circular 288, Oct. 1933. Market Classes and Grades of Pork Carcasses and Fresh Pork Cuts. Covers definitions of class and grade, methods of dressing, classifying and grading, weight selections, dressed schedule (barrows and gilts, sows, stags, and boars), dressing percentages, basis of grading, and definitions of terms.

U. S. Gov., Federal Specification PP-P-571; 1933. Amendment 3; 1942. Pork. Covers four types—(I) fresh, chilled, carcass, (II) fresh, frozen, carcass, (III) pork cuts, fresh, chilled (hams, shoulders, loins, tenderloins, spareribs, Boston butts), (IV) pork cuts, fresh, frozen; and two grades—1 and 2. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

012.2 PORK LOINS

U. S. Gov., Federal Specifications PP-P-571; 1933. Amendment 3; 1942. Pork. Covers four types—(I) fresh, chilled, carcass, (II) fresh, frozen, carcass, (III) pork cuts, fresh, chilled (hams, shoulders, loins, tenderloins, spareribs, Boston butts), (IV) pork cuts, fresh, frozen; and two grades—1 and 2. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010; dry salt cuts, *see* 012.92; fresh pork cuts, *see* 012.91.

012.3 HAM AND SHOULDERS

U. S. Gov., Federal Specification PP-H-61; 1940. Ham; Canned, Whole. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification PP-H-71; 1931. Amendment 5; 1942. Hams; Sweet-Pickle Cured, Smoked. Covers two types—(I) regular or short-cut and (II) skinned; and two grades—1 and 2. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification PP-P-571; 1933. Amendment 3; 1942. Pork. Covers four types—(I) fresh, chilled, carcass, (II) fresh, frozen, carcass, (III) pork cuts, fresh, chilled (hams, shoulders, loins, tenderloins, spareribs, Boston butts), (IV) pork cuts, fresh, frozen; and two grades—1 and 2. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010; fresh pork cuts, *see* 012.91.

012.4 PORK RIBS

References.—Definitions, methods of analysis, food regulations, *see* 010; fresh-pork cuts, *see* 012.91.

012.5 BACON

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Standard Packs. For sliced bacon, standard sizes of consumer packages by weight, and number of packages in shipping container.

U. S. Gov., Federal Specification PP-B-81a; 1938. Amendment 2; 1942. Bacon; Smoked. Covers two types—(I) dry sugar box cured (grades 1 and 2) and (II) dry sugar cured (grade 1). Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Dry salt bellies and sides, *see* 012.92; sweet pickled bellies, *see* 012.94; definitions, methods of analysis, food regulations, *see* 010.

012.6 HOG BRAINS

U. S. Gov., Federal Specification PP-B-661; 1932. Brains; Hog. Covers one grade and two types—fresh, chilled; and fresh, frozen. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

012.9 MISCELLANEOUS SPECIFICATIONS FOR PORK, HAM, AND BACON

012.91 Fresh Pork

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Circular 288, Oct. 1933. Market Classes and Grades of Pork Carcasses and Fresh Pork Cuts. Covers definitions of class and grade, methods of dressing, classifying and grading, weight selections, dressed schedule (barrows and gilts, sows, stags, and boars), dressing percentages, basis of grading, and definitions of terms.

References.—Definitions, methods of analysis, food regulations, *see* 010; other fresh pork, *see* 012.1-012.5.

012.92 Dry or Salt Pickled Pork

U. S. Gov., Federal Specification PP-F-81; 1932. Fatbacks; Dry-Salt-Cured. Consists of upper part of the side of hog, with the loin out, and the ham and shoulder removed. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification PP-P-586; 1937. Pork-Bellies, Clear; Dry-Salt-Cured. Covers one type—chilled. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Hams and shoulders, dry salt, *see* 012.3; ribs, dry salt, *see* 012.4; definitions, methods of analysis, food regulations, *see* 010.

012.93 Sugar Cured Pork

012.94 Sweet Pickle Cured Pork

References.—Hams and shoulders, sweet pickled, *see* 012.3; bacon, sweet pickled, *see* 012.5; definitions, methods of analysis, food regulations, *see* 010.

012.95 Smoked Pork

References.—Hams and shoulders, smoked, *see* 012.3; smoked bacon, *see* 012.5; definitions, methods of analysis, food regulations. *see* 010.

012.96 Pig's Feet

U. S. Gov., Federal Specification PP-P-371; 1932. Pig's Feet. Covers one grade and three types—uncooked, fresh; uncooked, salt pickled; and cooked, vinegar pickled. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

014. MUTTON AND LAMB

014.1 LAMB CARCASSES AND CUTS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 123. Official U. S. Standards for Grades of Lamb Carcasses, Yearling Mutton, and Mutton Carcasses, 1931; and Amendment 1, October 1940. Gives definitions of terms and specifications for grades—prime or No. A-1. choice or No. 1, good or No. 2, commercial or No. 3, utility or No. 4, and cull or No. 5, for lamb carcasses, yearling mutton carcasses, and mutton carcasses.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Dept. Bulletin 1470; 1927. Revised, 1942. Market Classes and Grades of Dressed Lamb and Mutton. Covers definition of lamb and mutton, basis for grading lamb and mutton, definition of terms, grades of lamb and mutton carcasses, standard wholesale cuts of lamb and mutton, description of wholesale cuts and subdivisions, percentage yield of wholesale cuts, and standard grades of wholesale lamb and mutton cuts.

U. S. Gov., Federal Specification PP-L-91a; 1943. Lamb. Covers four types—(I) carcass, fresh, chilled, (II) carcass, fresh, frozen, (III) wholesale cuts, fresh, chilled, and (IV) wholesale cuts, fresh, frozen; and three grades—(A) choice, (B) good, and (C) commercial. Gives material and workmanship, general and detail requirements, methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010.

014.2 MUTTON LOINS

014.3 CARCASSES, MUTTON

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Dept. Bulletin 1470; 1927. Revised, 1942. Market Classes and Grades of Dressed Lamb and Mutton. Covers definition of lamb and mutton, basis for grading lamb and mutton, definition of terms, grades of lamb and mutton carcasses, standard wholesale cuts of lamb and mutton, description of wholesale cuts and subdivisions, percentage yield of wholesale cuts, and standard grades of wholesale lamb and mutton cuts.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 123. Official U. S. Standards for Grades of Lamb Carcasses, Yearling Mutton, and Mutton Carcasses, 1931, and Amendment 1, Oct. 1940. Gives definitions of terms and specifications for grades—prime or No. A-1, choice or No. 1, good or No. 2, commercial or No. 3, utility or No. 4, and cull or No. 5 for lamb carcasses, yearling mutton carcasses, and mutton carcasses.

U. S. Gov., Federal Specification PP-M-791; 1931. Mutton. Covers four types—(I) fresh, chilled, carcass, (II) fresh, frozen, carcass, (III) fresh, chilled, wholesale market cuts, (IV) fresh, frozen, wholesale market cuts; and two grades—(A) good and (B) medium. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural

Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010.

015. POULTRY AND GAME

015.1 CHICKENS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Dressed Chickens, 1943. Covers young birds (broilers, fryers, roasters, stags, capons); old birds (fowl or stewing chickens, cocks); twelve sub-classes according to method of plucking, dressing, finishing, chilling, and packing; plucking (scalded, semi-scalded, dry), dressing (dressed-undrawn and eviscerated) finishing (milk-fed, grain-fed), chilling (fresh dressed, fresh hard-chilled, storage), and packing (dry, iced); for U. S. grades—(AA) commercially perfect specimens, (A) second highest grade, (B) third highest grade, and (C) edible dressed chickens below grade B. Gives definitions of terms and requirements for each type, class, sub-class, and grade.

U. S. Gov., Federal Specification PP-C-248; 1943. Chickens; Dressed (Broilers, Fryers, and Roasters, Stags, Capons, and Fowl). Covers four types—(I) fresh killed, (II) fresh chilled, (III) fresh hard chilled, and (IV) storage; six classes—(1) broilers, (2) fryers, (3) roasters, (4) stags, (5) capons, and (6) fowl; and two grades—(A) prime and (B) choice. Gives requirements for weight, material, workmanship; details for each type, class, and grade; methods of inspection and test; and packaging, packing, and marking for shipment.

References.—Fowl, *see* 015.3; definitions, methods of analysis, food regulations, *see* 010; inspection rules, *see* 015.0; live chickens, *see* 007.1.

015.2 DUCKS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades for Dressed Ducks, Geese, Guineas, and Squabs, 1943. Covers three U. S. grades—(A) highest grade, (B) second highest grade, and (C) edible below grade B. Gives details for each kind and grade, defines descriptive terms, table showing weights, and general grading requirements.

U. S. Gov., Federal Specification PP-D-745; 1943. Ducks, Geese, Guineas, and Squabs; Dressed. Covers four types—(I) fresh killed, (II) fresh chilled, (III) fresh hard chilled, and (IV) storage; six classes—(1) young ducks, (2) mature ducks, (3) geese, (4) young guineas, (5) mature guineas, and (6) squabs; and two grades—(A) prime and (B) choice. Covers weights; general requirements; detail requirements for each type, class, and grade; methods of inspection and test; and packaging, packing, and marking for shipment.

References.—Live ducks, *see* 007.3.

015.3 FOWLS

References.—Definitions, methods of analysis, food regulations, *see* 010; inspection rules, *see* 015.0; live poultry, *see* 007.

015.4 GEESE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades for Dressed Ducks, Geese, Guineas, and Squabs, 1943. Covers three U. S. grades—(A) highest grade, (B) second highest grade, and (C) edible below grade B. Gives details for each kind and grade, defines descriptive terms, table showing weights, and general grading requirements.

U. S. Gov., Federal Specification PP-D-745; 1943. Ducks, Geese, Guineas, and Squabs; Dressed. Covers four types—(I) fresh killed, (II) fresh chilled, (III) fresh hard chilled, and (IV) storage; six classes—(1) young ducks, (2) mature ducks, (3) geese, (4) young guineas, (5) mature guineas, and (6) squabs; and two grades—(A) prime and (B) choice. Covers weights; general requirements; detail requirements for each type, class and grade; methods of inspection, and test; and packaging, packing, and marking for shipment.

References.—Live geese, *see* 007.4.

015.5 TURKEYS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Dressed Turkeys, 1943. Covers four classes—young hens, young toms, old hens, old toms; twelve sub-classes according to method of plucking, dressing, finishing, chilling, and packing, plucking (scalded, semi-scalded, dry), dressing (dressed-undrawn and eviscerated), finishing (milk-fed-grain-fed), chilling (fresh dressed, fresh hard-chilled, storage), and packing (dry, iced); four U. S. grades—(AA) commercially perfect specimens, (A) second highest grade, (B) third highest grade, and (C) edible birds below grade B. Gives details for each class and grade, description of terms, general grading requirements; weight specifications for dressed turkeys, tentative U. S. wholesale grades for dressed turkeys, and recommendations for standardizing the dressing and packing of dressed turkeys.

U. S. Gov., Federal Specification PP-T-791b; 1943. Turkeys; Dressed. Covers four types—(I) fresh killed, (II) fresh chilled, (III) fresh hard chilled, and (IV) storage; four classes—(1) young hens, (2) young toms, (3) old hens, (4) old toms; and two grades—(A) prime and (B) choice. Gives requirements for weights, workmanship, dressed and eviscerated turkeys, and details for each type, class, and grade; methods of inspection and test; and packaging, packing, and marking for shipment.

References.—Definitions, methods of analysis, food regulations, *see* 010; inspection rules, *see* 015.0; live turkeys, *see* 007.2.

015.6 MEATS, WILD GAME

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Classes and Grades for Dressed Domestic Rabbits, 1942. Covers two classes—young and old; three sub-classes for young—broilers, fryers, and roasters; old are classified as stewers; and three grades for young—U. S. prime, U. S. choice, and U. S. commercial. Gives grade specifications for old rabbits, definitions and explanations of terms, and general requirements for grading.

U. S. Gov., Federal Specification PP-R-21; 1932. Rabbits; Dressed. Covers one type, fancy grade. Gives detail requirements; method of inspection; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification PP-R-146; 1933. Reindeer Meat. Covers six types—(I) fresh, frozen, whole carcass, skinned; (II) fresh, frozen, double fore quarters, skinned; (III) fresh, frozen, double short hind quarters, with two ribs, skinned; (IV) fresh, frozen, hind or fore quarters, boned, in blocks of approximately 50 lb.; (V) fresh, frozen, boned, hind or fore quarters, in blocks of approximately 100 lb.; and (VI) fresh, unfrozen (whole carcass, quarters, double quarters) for use in Alaska only. Gives detail requirements; method of inspection; and requirements for packaging, packing, and marking.

015.7 GUINEAS, DRESSED

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades for Dressed Ducks, Geese, Guineas, and Squabs, 1943. Covers three U. S. grades—(A) highest grade, (B) second highest grade, and (C) edible below grade B. Gives details for each kind and grade, defines descriptive terms, table showing weights, and general grading requirements.

U. S. Gov., Federal Specification PP-D-745; 1943. Ducks, Geese, Guineas, and Squabs; Dressed. Covers four types—(I) fresh killed, (II) fresh chilled, (III) fresh hard chilled, and (IV) storage; six classes—(1) young ducks, (2) mature ducks, (3) geese, (4) young guineas, (5) mature guineas, and (6) squabs; and two grades—(A) prime and (B) choice. Covers weights; general requirements; detail requirements for each type, class, and grade; methods of inspection and test; and packaging, packing, and marking for shipment.

015.8 PIGEONS, DRESSED

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades for Dressed Ducks, Geese, Guineas, and Squabs, 1943. Covers three U. S. grades—(A) highest grade, (B) second highest grade, and (C) edible below grade B. Gives details for each kind and grade, defines descriptive terms, table showing weights, and general grading requirements.

U. S. Gov., Federal Specification PP-D-745; 1943. Ducks, Geese, Guineas, and Squabs; Dressed. Covers four types—(I) fresh killed, (II) fresh chilled, (III) fresh hard chilled, and (IV) storage; six classes—(1) young ducks, (2) mature ducks, (3) geese, (4) young guineas, (5) mature guineas, and (6) squabs; and two grades—(A) prime and (B) choice. Covers weights; general requirements; detail requirements for each type, class, and grade; methods of inspection and test; and packaging, packing, and marking for shipment.

016. HORSE MEATS

016.0 GENERAL ITEMS

018. MEATS, PREPARED, PRESERVED, CANNED

018.0 GENERAL ITEMS

018.1 BEEF AND VEAL, PREPARED, PRESERVED, CANNED

References.—Pickled beef, *see* 011.95.

018.11 Tongue

U. S. Gov., Federal Specifications PP-5-571; 1931. Amendment 1; 1940. Tongue; Beef, Canned. Covers one grade. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010.

018.12 Corned Beef and Veal

U. S. Gov., Federal Specification PP-B-196; 1938. Beef, Corned; Bulk. Covers three types—(1) brisket (boneless), (II) plate, and (III) rump. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and tests.

U. S. Gov., Federal Specification PP-B-201; 1931. Amendment 2; 1937. Beef; Corned, Canned. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

Reference.—See references under 018.11.

018.13 Dried Beef and Veal

U. S. Gov., Federal Federation PP-B-211; 1931. Amendment 3; 1940. Beef; Dried, Sliced. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification PP-B-214; 1938. Beef, Dried; Unsliced. Covers two types—(I) insides and (II) knuckles. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—See references under 018.11.

018.14 Luncheon Meat

U. S. Gov., Federal Specification PP-L-791a; 1936. Amendment 2; 1942. Luncheon-Meat. Covers one grade and two types—(I) chilled and (II) frozen. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—See references under 018.11.

018.15 Corned Beef Hash

U. S. Gov., Federal Specification PP-H-91; 1932. Hash; Corned-Beef, Canned. Covers one grade. Approximately 50 percent corned beef, 47 percent potatoes (or equivalent of reconstituted, cubed dehydrated potatoes) and 3 percent onions. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

018.16 Veal Loaf

018.17 Spencer Roll

018.18 Roast Beef

018.19 Miscellaneous Beef Products

U. S. Gov., Federal Specification PP-C-276; 1943. Chili Con Carne; Plain (Without Beans), Concentrated (in Casings). Shall be of the type and grade indicated herein. Covers requirements for material and workmanship, inspection during preparation, proportions of various ingredients, methods of inspection, test, packaging, labeling, packing, and marking.

U. S. Gov., Federal Specification PP-S-74a; 1943. Sausage; Cervelat-Style. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification PP-S-96; 1943. Sausage; Salami. Covers two types—(I) dry and (II) cooked, prepared under supervision of meat Inspection Div., U. S. Dept. of Agriculture. Gives detail requirements and methods of inspection and test, as well as directions for labeling, packing, and marking.

018.2 PORK, PREPARED OR PRESERVED

References.—Dry or salt pickled pork, *see* 012.92; sugar cured and sweet pickle cured pork, *see* 012.93, 012.94; smoked pork, *see* 012.95.

018.20 General Items

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Standard Packs. For sausage, for 1-lb. package, required number to pack in a shipping container.

018.21 Head Cheese and Scrapple

U. S. Gov., Federal Specification PP-H-191; 1933. Amendment 1; 1940. Headcheese. Covers one grade and two types—fresh, chilled; and fresh, frozen. Made from hogs' heads (exclusive of lower lips and ears), hogs' rinds, and lean pork trimmings, in proportion of 35 percent of snouts, 30 percent of pork cheeks, 20 percent of lean pork trimmings, and 15 percent hogs' rinds. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification PP-S-141; 1932. Scrapple. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010., 018.20; standard packs, *see* 018.20.

018.22 Sausage, Bologna Style

U. S. Gov., Federal Specification PP-S-71; 1932. Amendment 3; 1942. Sausage; Bologna-Style. Covers one grade and two types—(I) chilled and (II) frozen. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 018.21.

018.23 Sausage, Frankfurter Style

U. S. Gov., Federal Specification PP-S-81; 1932. Amendment 4; 1942. Sausage; Frankfurter-Style. Covers three types—(I) fresh, (II) chilled, and (III) frozen. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 018.21.

018.24 Sausage, Pork

U. S. Gov., Federal Specification PP-S-78; 1942. Sausage; Farmer (Dry Type). Gives requirements for material and workmanship, preparation, regulations, and details; methods of inspection and test; and packaging, labeling, packing, and marking for shipment.

U. S. Gov., Federal Specification PP-S-91; 1932. Amendment 2; 1940. Sausage; Pork. Covers five types—(I) chilled, (II) frozen, (III) canned, (IV) package, and (V) bulk. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 018.21.

018.25 Sausage, Vienna Style

U. S. Gov., Federal Specification PP-S-101; 1932. Amendment 2; 1941. Sausage; Vienna-Style, Canned. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 018.21.

018.26 Sausage Substitute

018.27 Souse, Pig

018.28 Ham, Cooked

018.29 Miscellaneous Prepared Pork Products

U. S. Gov., Federal Specification PP-P-578; 1942. Pork; Luncheon-Meat, Canned (Fully-Processed). Gives requirements for material and workmanship, methods of inspection and tests; and requirements for packaging, labeling, packing, and marking for shipment.

U. S. Gov., Federal Specification PP-S-86; 1932. Sausage; Liver. Covers one grade and two types—(I) fresh, and (II) smoked. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification PP-S-96; 1943. Sausage; Salami. Covers two types—(I) dry and (II) cooked, prepared under supervision of Meat Inspection Div., U. S. Dept. of Agriculture. Gives detail requirements and methods of inspection and test, as well as directions for labeling, packing, and marking.

018.3 MUTTON AND LAMB, PREPARED OR PRESERVED

References.—Prepared mutton suet for medical purposes, *see* 043.1.

018.4 CHICKEN; TURKEY, ETC.

018.5 MINCEMEAT

U. S. Gov., Federal Specification PP-M-351; 1931. Amendment 2; 1940. Mincemeat. Covers one grade and three types—(A) mincemeat with low moisture content, (B) mincemeat with maximum moisture content of 30 percent by weight, and (C) fancy. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010.

018.9 MISCELLANEOUS MEATS

U. S. Gov., Federal Specification EE-C-281; 1941. Chili Con Carne; Plain, or With Beans. Covers two types—(I) plain and (II) with beans. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

019. EGGS

019.0 GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Eggs and Egg Products. Method of sampling for liquid eggs, frozen eggs, powdered dried eggs, flaked and drum dried eggs, methods for determination of total solids. organic and ammoniacal nitrogen, water soluble protein-nitrogen, fat, lipoids, lipoid phosphoric acid, unsaponifiable matter, detection of decomposition, acidity of fat, phosphoric pentoxide, chlorine, identification of added color, detection of whole egg or commercial egg yolk solids, estimation of percentage of egg solids.

U. S. Gov., Treasury Dept., Procurement Div., No. 614; 1943. Albumen; Egg, Dried, Technical-Grade. Shall be furnished in one grade and type I (powder) or type II (scales, granules, crystals, etc.). Gives general requirements, non-volatile matter, matter insoluble in water, specific gravity of solution, odor, starch and dextrin, ash, particle size, sampling, inspection, tests, packaging, packing, and marking.

019.1 FRESH EGGS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards and Weight Classes for Consumer Grades for Shell Eggs, 1942. Gives requirements for U. S. Consumer Grades AA, A, B, and C; table showing minimum weights per dozen, per 30 dozen, and per individual egg for sizes—jumbo, extra large, large, medium, and small; and summary.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Procurement Grades for Shell Eggs, 1943. For use by the U. S. armed forces and other Government agencies. Gives requirements for grades I, II, III, and IV; weight; and quality of individual eggs.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative United States Standards and Weights for Wholesale Grades for Shell Eggs, 1943. Gives requirements for grades U. S. Nos. 1, 2, 3, and 4 for specials, extras, and standards; U. S. Nos. 1 and 2 for trades; U. S. light dirties; U. S. dirties; and U. S. checks. Also table showing average, minimum, and basic minimum weights for each grade.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. United States Standards for Quality for Individual Shell Eggs, 1943. U. S. Standards for quality of individual eggs with—(1) clean unbroken shells (U. S. grade AA, U. S. grade A, U. S. grade B, and U. S. grade C), (2) with dirty unbroken shells (U. S. light dirty and U. S. dirty), (3) with checked or cracked shells (U. S. check and U. S. leaker). Gives explanation of terms descriptive of shell, terms descriptive of yolk, terms descriptive of white, general terms, table showing summary of U. S. standards for quality of individual shell eggs, and chart showing minimum requirements for U. S. grades AA, A, B, and C.

U. S. Gov., Federal Specification C-E-271a; 1943. Eggs; Shell. Covers one type (hen eggs) in four classes—(I) fresh, (II) fresh processed, (III) storage, and (IV) storage processed. Also designates 6 grades—AA, A, B, C, D, and E; 5 weights—jumbo, extra large, large, medium, and small; and 7 qualities—special, extra, standard, trade, light dirty, dirty, and check. Gives general and detail requirements; methods of inspection and tests; and packaging, labeling, packing, and marking for shipment.

References.—Food regulations, *see* 010; grading rules for eggs, *see* 019.0.

019.2 FROZEN EGGS

New York Product Exchange. Frozen Egg Rules, 1935. Shall be for whole mixed eggs, for whites, or for yolks. Eggs must be of American origin and must be broken and packed in the United States. Gives requirements for temperature, pure and wholesome, and percentage of solids.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C. 2; 1944. Definitions and Standards for Food. Eggs. Covers liquid eggs, mixed eggs, liquid whole eggs, and mixed whole eggs; frozen eggs, frozen whole eggs, and frozen mixed eggs; dried eggs and dried whole eggs; egg yolks, liquid egg yolks, yolks, and liquid yolks; frozen yolks and frozen egg yolks; and dried egg yolks and dried yolks.

019.9 MISCELLANEOUS EGG PRODUCTS

American Leather Chemists Assn. Methods of Sampling and Analysis. Egg Yolk, 1942. Gives requirements for water, ash, sodium chloride, borates, fat, examination of fat, and albumin.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C. 2; 1944. Definitions and Standards for Food. Eggs. Covers liquid eggs, mixed eggs, liquid whole eggs, and mixed whole eggs; frozen eggs, frozen whole eggs, and frozen mixed eggs; dried eggs and dried whole eggs; egg yolks, liquid egg yolks, yolks, and liquid yolks; frozen yolks and frozen egg yolks; and dried egg yolks and dried yolks.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-1; 1921. Albumen; Egg.

020-029 DAIRY PRODUCTS

021. MILK AND CREAM

021.0 GENERAL ITEMS

American Public Health Assn. Standard Methods for the Examination of Dairy Products——Microbiological, Bioassay and Chemical—1941. Includes microbiological methods for the examination of milk, cream, and butter; microbiological methods for the examination of frozen desserts and ingredients of frozen desserts; bioassay of vitamin D milk; chemical methods; and proposed phosphatase methods for determination of pasteurization.

Evaporated Milk Assn. Sanitary Standards for the Evaporated Milk Industry, 1940. Includes standards for plant and equipment, plant operation, personnel, milk supply, transportation of milk to plant, and tests for quality to be applied at receiving room.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C19; 1924. Standard Density and Volumetric Tables. Includes tables and specific gravity and weight per gallon of milk and cream, and volume of milk and cream at various temperatures.

021.1 FRESH MILK, INCLUDING PASTEURIZED

American Assn. of Medical Milk Commissions, Inc. Methods and Standards for the Production of Certified Milk, 1944. Covers definitions of certified milk; organization and duties of medical milk commissions; laboratory standards for certified milk; buildings and equipment; care and handling of animals; milking; milk handling, transportation, and distribution; personnel; and medical supervision. Adopted by the Certified Milk Producers Assn. of America (Inc.).

The American Pharmaceutical Assn. and the National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cow's Milk; fresh, unpasteurized or pasteurized milk of the domestic cow.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis; 1940. Milk. Collection and preparation of sample, determination of solids, ash, total nitrogen, casein, albumin, lactose, fat, amount of added water, presence of gelatin, determination of preservatives, coloring matters, and tentative methods for determination of specific gravity, acidity.

U. S. Gov., Federal Specification C-M-381c; 1942. Milk; Fresh. Covers four types—(I) certified for (a) raw and (b) pasteurized; (II) grade A pasteurized; and (III) pasteurized. Gives general requirements for materials and workmanship; detail requirements for each type; method of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists and bacteriological examinations in accordance with methods and technique of the American Public Health Assn.); and requirements for packaging and packing.

References.—Definitions, methods of analysis, food regulations, density tables, *see* 021.0.

021.2 FRESH CREAM

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Cream. Collection and preparation of sample, determination of total solids, ash, total nitrogen, lactose, fat, gelatin, preservatives, coloring matters, and added water.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Grades for Churning Cream, issued February 15, 1935. Covers six U. S. grades—AA, A, B, C, D, and reject. Gives requirements for each grade and definitions of terms.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Cream. Covers (1) cream class of food, identity, (2) light cream, coffee cream, table cream; identity, (3) whipping cream class of food, identity, (4) heavy cream, heavy whipping cream; identity.

U. S. Gov., Federal Specification C-C-671a; 1937. Cream; Fresh. Covers four types—(I) grade A pasteurized, (II) grade A pasteurized whipping, (III) pasteurized, and (IV) pasteurized whipping. Gives general and detail requirements; methods of inspection and tests (chemical analysis in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, density tables, *see* 021.0.

021.3 BUTTERMILK

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Milk Products. Defines dried buttermilk, evaporated buttermilk, concentrated or condensed buttermilk, dried skimmed milk, evaporated soured skim milk, concentrated or condensed soured skimmed milk, dried whey, and cheese rind.

U. S. Gov., Federal Specification C-B-816; 1932. Amendment 2; 1937. Buttermilk. Covers one grade in two types—(a) plain and (b) cultured; and gives general requirements for material and workmanship, detail requirements for each type, methods of inspection and tests (chemical analysis in accordance with methods of Assn. of Official Agricultural Chemists and bacteriological analysis in accordance with American Public Health Assn.), packing, packaging, and marking.

References.—Definitions, methods of analysis, food regulations, density tables, *see* 021.0.

021.4 CONCENTRATED MILK

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Concentrated Milk and Plain Condensed Milk. Covers identity and label statement of optional ingredients.

021.5 CONDENSED MILK

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Condensed Milk. Covers (1) sweetened condensed milk, identity, (2) condensed milks which contain corn sirup, and identity.

U. S. Gov., Federal Specification C-M-321; 1931. Amendment 1; 1937. Milk, Condensed. Covers sweetened condensed milk. Gives detail requirements; method of inspection and test (chemical analysis in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 021.0.

021.6 EVAPORATED MILK

Evaporated Milk Assn. Sanitary Standards for Evaporated Milk Industry, 1940. Covers standards for plant and equipment, plant operation, plant personnel, the milk supply, transportation of milk to plant, tests for quality to be applied at receiving room, and standards for evaporated milk.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Evaporated Milk. Covers identity and label statement of optional ingredients.

U. S. Gov., Federal Specification C-M-371; 1931. Amendment 3; 1942. Milk; Evaporated. Covers unsweetened evaporated milk. Gives requirements on general quality, content of milk fat and of milk solids, methods of test as specified by Assn. of Official Agricultural Chemists.

References.— Definitions, methods of analysis, food regulations, *see* 021.0.

021.7 MALTED MILK, MILK POWDER

American Dry Milk Institute, Inc. Feed Grades for Dry Skim Milk. Covers three grades—choice, standard, and sample. Gives general requirements, details for each grade, method of sampling, methods of analysis, laboratory tolerations, testing service, and referee to settle disputes.

American Dry Milk Institute, Inc. Grading of Nonfat Dry Milk Solids, 1944. Covers four grades—premium, extra, standard, and unfit for human consumption. Gives general requirements, detail requirements for each grade, method of sampling and preparation, determination of moisture, determination of butterfat, determination of solubility index, bacterial count, foreign sediment and burned particles, determination of titratable acidity, falvor and odor, variations in laboratory results, and testing service.

American Dry Milk Institute, Inc. Sanitary and Quality Standards for the Dry Milk Industry with Methods of Analysis, Bulletin 906; 1944. Applicable to manufacturing plants, receiving stations, and any other plants from which milk in any form is received and used for drying. Covers plant, equipment, plant operations, plant personnel, milk supply, transportation to plant, raw milk quality, methods testing, standards for dry milk, required analyses, and packaging and identification.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Dried Milk and Malted Milk. Tentative methods for preparation of sample, for determination of moisture, protein, ash, and fat, microscopical identification of malted milk and its flavored products.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Dried Skim Milk and Dried Whole Milk, 1943. For all classes of dried skim milk and dried whole milk for human food and shall meet all requirements of the Federal Food, Drug, and Cosmetic Act. Covers U. S. extra grade and U. S. standard grade for dried skim milk and U. S. extra grade for dried whole milk. Gives requirements for moisture, butterfat, acidity, solubility index, bacteria, and sediment for each grade; guarantee; farm milk quality; plant equipment; plant manufacturing; and methods of sampling, testing, and grading.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Skim Milk. Covers (1) dried skim milk, (2) powdered skim milk, (3) skim milk powder, and identity.

U. S. Gov., Federal Specification C-M-341; 1931. Amendment 1; 1937. Milk; Dry, Malted. Covers one grade, unflavored type. Contains detail requirements; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing and marking.

U. S. Gov., Federal Specification C-M-351c; 1943. Milk, dry powdered, skimmed, and whole. Covers one grade, two types—(I) skimmed, dry, powdered, and (II) whole, dry, powdered; and three classes—(A) spray process, (B) vacuum drum process, and (C) atmopheric roller process. Gives general requirements for material and workmanship; detail requirements for each type and class; method of inspection (bacterial count procedure according to standard nutrient agar plate method of American Public Health Assn., and moisture and butterfat determination according to methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of analysis, food regulations, *see* 021.0.

021.8 MILK FAT OR BUTTERFAT

021.9 MISCELLANEOUS SPECIFICATIONS FOR MILK AND CREAM

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Milk Products. Defines dried skimmed milk, dried soured skimmed milk, evaporated sour skimmed milk, concentrated or condensed soured skimmed milk, condensed skimmed milk, dried, whey, and cheese rind.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Ice Cream (Plain). Preparation of sample, determination of fat and of nitrogen, tentative method for detection of coloring matter.

References.—Definitions, methods of analysis, food regulations, *see* 021.0.

022. BUTTER, CHEESE, AND THEIR SUBSTITUTES

022.0 GENERAL ITEMS

022.1 BUTTER

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Butter. Sampling determination of moisture, fat, casein, ash, salt, preservatives, coloring matters, microscopic examination.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Butter. Covers definition, characteristics, derivation, grades, marketing, containers, storage, and substitutes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Reprinted from Federal Register, Volume 8, No. 22, Washington, Feb. 2, 1943. Official U. S. Standards for Grades of Creamery Butter. Covers six grades—U. S. grade AA or U. S. 93 score, U. S. grade A or U. S. 92 score, U. S. grade B or U. S. 90 score, U. S. grade C or U. S. 89 score,

U. S. cooking grade, and no grade. Gives basis for determination of U. S. grades, classification of flavors in creamery butter (about 50 flavors); rating for defects in body, color, and salt; and table of the relation of U. S. grade to flavor classification and total defects in body, color, and salt.

U. S. Gov., Federal Specification C-B-801b; 1944. Butter. Covers three grades—AA-93 score, A-92 score, and B-90 score. Gives general requirements for cream material and workmanship; all deliveries shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act; detail requirements in each grade for flavor, body, color, salt, package, and factors and ratings of inspection; methods of inspection and test (chemical analysis and the mold count test in accordance with methods of Assn. of Official Agricultural Chemists); and packaging, labeling, packing, and marking for shipment.

References.—Food regulations, *see* 022.0; renovated butter, *see* 022.2.

022.2 RENOVATED BUTTER

References.—Food regulations, *see* 022.0.

022.3 BUTTER SUBSTITUTE

U. S. Gov., Federal Specification EE-O-451a; 1942. Oleomargarine. Covers one grade and two types—(A) product containing fats and (B) product not containing animal fats. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Food regulations, *see* 022.0.

022.4 CHEESE

022.40 General Items

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Cheese. Selection and preparation of sample, determination of moisture, ash, salt, nitrogen, acidity, fat, and tentative methods for determination of coloring matter, tartaric acid, and citric acid.

022.41 Whole Milk Cheese

References.—Methods of analysis, *see* 022.40; *see* American (cheddar) cheese 022.45.

022.42 Full Cream Cheese

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Cream Cheese. Covers identity and label statement of optional ingredients.

022.43 Edam Cheese

References.—Methods of analysis, *see* 022.40.

022.44 Camembert Cheese

References.—Methods of analysis, *see* 022.40.

022.45 American (Cheddar) Cheese

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of American Cheddar Cheese, 1943. Covers U. S. grades—AA or U. S. fancy, A or U. S. No. 1, B or U. S. No. 2, and C or U. S. under grade. Cheese below grade C shall be classified no grade. Gives definition, basis of determination for U. S. grade, general specifications for cheese of all ages, specifications applicable to cheese of different ages, specifications for each grade, details for no grade cheese, terms used to describe body and texture, terms used to describe color, and terms used to describe finish and appearance.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Cheddar Cheese. Covers cheddar cheese, cheese, and identity.

U. S. Gov., Federal Specification C-C-271a; 1938. Amendment 5; 1942. Cheese; American (Cheddar or American-Cheddar) and Process American. Covers two types: (I) Natural in three classes—(A) nippy, sharp, or aged; (B) mellow or medium cured; and (C) mild or current; and (II) process in three grades—(A) nippy, sharp, or aged; (B) mellow or medium cured; and (C) mild or current. Gives requirements for material and workmanship, body and texture, flavor, finish, appearance, and color; methods of sampling, inspection, and tests (chemical analysis in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking for shipment.

References.—Methods of analysis, *see* 022.40; *see* whole milk cheese, 022.41.

022.49 Miscellaneous Specifications for Cheese

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Covers (1) washed curd cheese, soaked curd cheese; identity, (2) Colby cheese, identity, (3) Neufchatel cheese; identity, label statement of optional ingredients, (4) cottage cheese, identity, and (5) creamed cottage cheese, identity.

U. S. Gov., Federal Specification C-C-281; 1932. Amendment 1; 1937. Cheese; Cottage. Covers curd type in one grade. Gives general and detail requirements; methods of inspection and test (chemical analysis in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification C-C-301a; 1938. Amendment 1; 1941. Cheese; Swiss (Domestic and Process). Covers four types: (I) Drum or wheel, in two grades—(A) fancy and (B) No.1; (II) block, in two grades—(A) fancy and (B) No.1; (III) cut, in two grades—(A) fancy and (B) No.1; and (IV) process of the best grade. Gives requirements for material and workmanship, body, texture and eyes, flavor, finish and appearance, and salt; methods of sampling, inspection, and tests (chemical analysis in accordance with methods of Assn. of Official Agricultural Chemists;) and requirements for packaging, packing, and marking for shipment.

References.—Methods of analysis, *see* 022.40.

030-039 FISH

031. FRESH FISH

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Fish and Other Marine Products. Includes fresh fish—preliminary treatment and preparation of sample and determination of salt, ash, and total nitrogen.

U. S. Gov., Federal Specification PP-F-381b; 1941. Fish; Fresh. Covers one grade and six types—(I) fresh, not dressed; (II) fresh, dressed; (III) fresh, fillets or steaks; (IV) frozen, not dressed; (V) frozen, dressed; and (VI) frozen, fillets or steaks. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

034. FISH, SALTED OR DRY CURED

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Fish and Other Marine Products. Includes dried smoked or dried salt fish—preliminary treatment and preparation of sample and determination of ash, salt, and total nitrogen.

U. S. Gov., Federal Specification PP-F-401; 1931. Fish; Salted or Smoked. Covers one grade and one type. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of analysis, food regulations, *see* 010.

035. CANNED FISH

035.1 CANNED CODFISH AND HADDOCK

References.—Definitions, methods of analysis, food regulations, *see* 010.

035.2 CANNED SALMON

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Fish and Other Marine Products. Includes canned salmon and similar types of canned fish and canned fish packed in oil—preliminary treatment and preparation of sample and determination of salt, ash, and total nitrogen.

U. S. Gov., Federal Specification PP-S-31a; 1941. Amendment 1; 1942. Salmon; Canned. Covers six types—(A) chinook, (B) red, (C) coho, (D) pink, (E) chum, and (F) steelhead. Gives general and detail requirements; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—See references under 035.1.

035.3 CANNED SARDINES

U. S. Gov., Federal Specification PP-S-51b; 1938. Sardines (Domestic); Canned. Covers six types—(I) packed in olive oil, (II) packed in edible vegetable oil, (III) packed in mustard, (IV) packed in tomato sauce, (V) soused, (VI) natural. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.— See references under 035.1.

035.4 CANNED FISH FLAKES

U. S. Gov., Federal Specification PP-F-371; 1931. Fish; Flaked, Canned. Covers one grade and three types—(I) codfish, (II) haddock, and (III) codfish and haddock. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Flaked codfish and haddock, *see* 035.1.

035.5 CANNED HERRING

References.—See references under 035.1.

035.6 CANNED TUNA

U. S. Gov., Federal Specification PP-T-771; 1931. Amendment 1; 1935. Tuna Fish; Canned. Covers one type and one grade. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—See references under 035.1.

035.7 CANNED MACKEREL

035.8 CANNED ANCHOVIES

036. FRESH SHELLFISH

036.0 GENERAL ITEMS

American Public Health Assn. Recommended Methods of Precedure for Bacteriological Examination of Shellfish and Shellfish Waters, 1943. Covers introduction, including definition of shellfish and coliform group; bacteriological examination of shellfish-growing waters including collection and transportation of sample, field record, procedure, confirmation, and Escherichia coli; bacteriological examination of shellfish including collection and transportation of sample, field record, procedure, and examination for members of the coliform group and Escherichia coli; and expression of results and appendix.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Fish and Other Marine Products. Includes shellfish—preliminary treatment and preparation of sample and determination of solids (oysters and scallops only), ash, salt, and nitrogen.

036.1 OYSTERS

U. S. Gov., Federal Specification PP-O-956a; 1932. Oysters; Fresh. Covers three grades—(A) averaging 150-200 oysters per gal., (B) averaging 200-250 oysters per gal., and (C) averaging 250-300 oysters per gal. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions, methods of analysis, food regulations, *see* 010.

036.2 CLAMS

U. S. Gov., Federal Specification PP-C-401; 1931. Clams; Fresh. Covers one grade and two types—(I) hard and

(II) soft (or soft-shell). Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—See references under 036.1.

036.3 CRAB MEAT

U. S. Gov., Federal Specification PP-C-656; 1931. Amendment 1; 1941. Crabmeat; Fresh. Covers one grade and three types—(I) lump, (II) flake, and (III) claw. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—See references under 036.1.

036.4 LOBSTERS

036.5 SHRIMP

U. S. Gov., Federal Specification PP-S-316; 1945. Shrimp; Raw, Boiled, Frozen. Covers unveined and veined in four types—(I) raw, unpeeled; (II) boiled, peeled; (III) frozen, unpeeled; and (IV) frozen, peeled. Gives sizes, grade, material and workmanship, general requirements, and details for each type; methods of inspection and test; and packaging, packing, and marking for shipment.

037. CANNED SHELLFISH

037.1 CANNED SHRIMP

U. S. Gov., Federal Specification PP-S-311; 1931. Amendment 3; 1941. Shrimp; Canned. Covers one grade and two types—(I) wet pack and (II) dry pack. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.C.C.2; 1944. Definitions and Standards for Food. Canned Shrimp. For canned wet-pack shrimp and canned dry-pack shrimp in nontransparent containers. Covers fill of containers and label statement of substandard fill.

References.—Definitions, methods of analysis, food regulations, *see* 010.

037.2 CANNED CRAB MEAT

U. S. Gov., Federal Specification PP-C-651; 1933. Amendment 1; 1940. Crabmeat; Canned. Covers three types—(I) white or body meat, (II) claw meat, and (III) body and claw meat. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

037.3 CANNED LOBSTERS

037.4 CANNED OYSTERS

U. S. Gov., Federal Specification PP-O-951; 1931. Amendment 1; 1936. Oysters; Canned. Covers the type known commercially as "Cove." Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

039. MISCELLANEOUS FISH PRODUCTS

039.1 CAVIAR

039.2 ANCHOVY PASTE

039.3 CLAM JUICE

039.4 FEEDS OF FISH MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Marine Products. Defines fish meal, fish residue meal, crab meal, and shrimp meal.

References.—Definitions, methods of analysis, *see* 010.

040-049 ANIMAL AND FISH OILS, FATS, AND GREASES

040. GENERAL ITEMS

American Leather Chemists Assn. Methods of Sampling and Analysis. Includes Moellon, 1938. Gives requirements for moisture, ash, unsaponifiable, oxidized fatty acids, and free fatty acids.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sulfonated and Sulfated Oils, 1943. Gives requirements for moisture, organically combined sulfuric anhydride, total desulfated fatty matter, total active ingredients, unsaponifiable nonvolatile matter, inorganic salts, total alkalinity, total ammonia, acidity as free fatty acids or acid number, and neutral fatty matter.

American Oil Chemists' Society. Methods of Analysis, 1941. Crismer Turbidity Test for Non-Drying Oils. Includes butter fat and lard. Covers reagents, apparatus, determination, and table of corrections for acidity of oils tested.

American Oil Chemists' Society. Tentative Methods of Analysis for Sulfonated (Sulfated) Oils, 1938. Covers methods for determination of water, water and other compounds volatile at about 100° C., organically combined sulphuric anhydride, and inorganic sulphates and chlorides.

American Oil Chemists' Society. Standard Methods for the Sampling and Analysis of Commercial Fats and Oils, 1943. Applies to fats and fatty oils used in the soap, candle, and tanning industries, to edible fats and oils, to fats and fatty oils intended for lubricating and burning purposes, and to the raw oils used in the varnish and paint industry, but not intended for waxes. Covers sampling; analysis for moisture and volatile matter, insoluble impurities, soluble mineral matter, fatty acids combined as mineral soap, free fatty acids, titer, unsaponifiable matter, iodine number, saponification number, melting point, softening point, slipping point, flow test, cloud test, bleach test, Halphen test (for cottonseed oil), modified Vallavecchia test, Reichert-Meissl and Polenske numbers, Kirschner value, index of refraction, specific gravity, acetyl and hydroxyl value, smoke, flash and fire points, F.A.C. standard colors, modified Wiley melting point method, thiocyanogen method, and Twitchell method.

American Society for Testing Materials, D94-44; 1944. American Petroleum Institute Standard 547-44. American Standards Assn. Z11.20-1944. Method of Test for Saponification Number of Petroleum Products by Color-Indicator Titration. The method is applicable to new and used petroleum oils including electrical insulating oils and to mixtures of fats and mineral oils. Gives definition, principle of method, apparatus, reagents, blank determinations, sample, procedure, calculation, identification of fat, and reproducibility of results.

American Society for Testing Materials, D500-41; 1941. Methods of Chemical Analysis of Sulfonated and Sulfated Oils. Analytical procedures—moisture (water by distillation with volatile solvent method and moisture and volatile matter by hot-plate method); organically combined sulfuric anhydride (titration test, extration-titration test, and ash-gravimetric test methods); total desulfated fatty matter; total active ingredients; unsaponifiable nonvolatile matter; inorganic salts; total alkalinity; total ammonia; and acidity as free fatty acids or acid number (in the absence of ammonium or triethanolamine soaps, in the presence of dark colored oils but in the absence of ammonium or triethanolamine soaps, and in the presence of ammonium or triethanolamine soaps).

American Society for Testing Materials D500-43T; 1943. Tentative Method of Test for Water-Immiscible Organic Solvents Volatile With Steam in Sulfonated and Sulfated Oils. Alcohol or other volatile compounds that are mutually soluble in water and solvents interfere in this method. Gives apparatus, calibration, procedure, calculation, and reproducibility of results.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Oils, Fats, and Waxes. Preparation of sample, determination of apparent specific gravity, index of refraction, melting point of fats, titer test, iodine absorption number, saponification number, soluble acids, insoluble acids, free fatty acids, acetyl value, unsaponifiable residue, cottonseed oil, amount of peanut oil and sesame oil, cold test, tentative methods for determination of cholesterol and phytosterol, presence of resin oil, detection of foreign fats containing tristearin in lard, detection of fish oils in presence of vegetable oils, detection of coloring matters.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Commercial Standard CS43-32; 1932. Grading of Sulphonated (Sulphated) Oils, Saponifiable Types. This specification covers the method of grading sulphonated (sulphated) oils, saponifiable types, which split off their organically combined SO_3 upon boiling with mineral acids, and includes definition, nomenclature, and methods of analysis.

041. ANIMAL OILS

041.1 WHALE AND SPERM OIL

American Oil Chemists' Society. Methods of Analysis, 1941. Crismer Turbidity Test for Marine Oil. Includes whale oil. Covers reagents, apparatus, determination, and table of corrections for acidity of oils tested.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Sperm Oil and Spermaceti. Covers definition, constants, solubility, conversion factor, derivation, grades, uses, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Whale Oil. Covers definition, constants, uses, derivation, grades, containers, and substitutes.

U. S. Gov., Navy Dept. Specification 1405a; 1916. Oil; Sperm.

U. S. Gov., Treasury Dept., Procurement Div., No. 473; 1941. Oil, Sperm. Covers one type and grade intended for use as a lubricant for light machinery. Gives requirements for specific gravity, pour point, flash point, iodine number, saponification number, and neutralization number; methods pf sampling, inspection, and tests; and packaging, packing, and marking.

041.2 OLEO OIL

041.3 LARD OIL

National Assn. of Wool Manufacturers Specification L-1; 1942. Lard Oil—Now Known as Grease Oil. Gives requirements for grade, free fatty acid, cold test, specific gravity, saponification value, iodine number, unsaponifiable matter, and color.

U. S. Gov., Federal Specification C-O-376; 1934. Oil; Lard. Covers one grade suitable for the lubrication of tools for pipe cutting and threading. Gives general and detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of analysis, food regulations, *see* 040; other cutting oils, *see* 504.7.

041.4 NEAT'S-FOOT OIL

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Neat's-Foot Oil; Covers definition, constants, uses, derivation, grades, containers, and substitutes.

U. S. Gov., Federal Specification C-O-388; 1941. Oil; Neat's-Foot. Covers one grade. Gives detail requirements for color, specific gravity, pour point, free fatty acids, calculated as oleic acid, saponification number, unsaponifiable matter limitation, and iodine number; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

042. FISH OIL

042.1 COD OIL

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cod Oil and Cod Liver Oil. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

042.2 COD LIVER OIL

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Cod Liver Oil. Gives table showing recommended standard for cod liver oil.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Cod Liver Oil. Defines species that oil may be obtained from, number of U.S.P. vitamin A units, and of Assn. of Official Agricultural Chemists chick units of vitamin D per gram.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cod Oil and Cod Liver Oil. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Cod Liver Oil. Description, solubility, specific gravity, color, undestearinated cod liver oil, unsaponifiable matter, saponification value, iodine value, acid value, spectrophotometric absorption value, assay, and storage. U.S.P. product of cod liver oil—Emulsum Olei Morrhuae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Emulsion of Cod Liver Oil. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Halibut Liver Oil. Description, solubility, specific gravity, identification, free fatty acids, unsaponifiable matter, saponification value, iodine value, assay, and storage. U.S.P. product of halibut liver oil—Capsulae Loei Hippoglossi.

U.S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Halibut Liver Oil Capsules. Oil content of capsules, description, tests, assay, and storage.

U.S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Non-Destearinated Cod Liver Oil. Description, solubility, water and sediment, iodine value, other requirements, assay, and storage.

References.—Methods of analysis, food regulations, *see* 040.

042.3 HERRING AND MENHADEN OIL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Herring and Menhaden Oils. Definitions of source of extract.

042.4 SARDINE OIL, PILCHARD OIL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Sardine Oil or Pilchard Oil. Definitions of source of extract.

042.5 SALMON OIL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Salmon Oil and Salmon Liver Oil. Definitions of source of extract.

042.6 TUNA OIL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Tuna Oil. Definitions of source of extract.

043. ANIMAL FATS AND GREASES

043.0 GENERAL ITEMS

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Standard Packs. For domestic lard and shortening, standard consumer packages by weight, required number to pack in one shipping container, for 1-lb. carton and several sizes of cans.

American Oil Chemists' Society. Methods of Analysis, Tallows, Greases, Fatty Acids, Etc., 1941. Covers apparatus and color determination, apparatus and bleaching determination, refining conditions, fatty acids of soap stock and acidulated soap stock, titer, and table of correction for acidity of oils tested.

New York Produce Exchange. Animal Oils and Fats, 1921. Rules covering licensed inspectors, testers, weighers, and samplers; for packages and weights, deliveries, quality and grades. Includes three grades of tallows, white hog greases, and white stearine grease; also No. 2 tallows, yellow grease, yellow grease stearine, house and bone greases; and low grades, brown grease, garbage grease, naphtha grease, and fatty acids.

043.1 TALLOW

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Tallow; Beef. Covers definition, constants, occurrence, impurities, and general grades available.

New York Produce Exchange. Rules Regulating Transactions in Tallow for Future Delivery, 1939. Must be entirely animal fat, untreated and unbleached, and of good merchantable quality. Gives requirements for color (in accordance with standard color tubes of the American Oil Chemists Society), amount of free fatty acid as oleic, titre, moisture, impurities, and unsaponifiable matter.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Prepared Suet (Mutton Suet). Description, solubility, melting and congealing points, saponification value, iodine value, acid value, and storage.

U. S. Gov., Federal Specification C-T-91; 1942. Tallow. Covers one type and grade. Gives requirements for material (ash, unsaponifiable matter, water, neutralization number, and melting point); methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-74; 1921. Tallow; Mutton, Refined.

References.—Methods of analysis, *see* 043.0; food regulations, *see* 040., 043.0.

043.2 LARD

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Lard. Covers definition, derivation, uses, grades and standards, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Lard. Description, solubility, melting point, chloride, alkalies, beef stearin, cottonseed fats, saponification value, iodine value, acid value, solidification point of fatty acids, and storage. U.S.P. product of lard—Adeps Benzoinatus.

U. S. Gov., Federal Specification EE-S-321; 1944. Shortening. Covers two types: (I) Lard—(a) refined, (b) service style, (c) service style with lecithin, and (d). open-kettle rendered; and (II) shortening other than lard—(a) hydrogenated (animal fats or oils, vegetable fats or oils, and mixed), and (b) blended (animal fats or oils, vegetable fats or oils, and mixed). Gives material and workmanship, general requirements, and details for each type and class; methods of inspection and test (chemical analyses shall be made in accordance with methods of the Assn.

of Official Agricultural Chemists); and packaging, labeling, packing, and marking for shipment.

References.—Methods of analysis, standard pack, *see* 043.0; food regulations, *see* 040., 043.0.

043.21 Benzoinated Lard

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Benzoinated Lard. Proportions, method of mixing and melting lard with Siam benzoin (in coarse powder form), adding white wax for use in southern latitudes, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Cerate (Simple Cerate—Rosin Cerate) (Resin Cerate). Preparations and storage.

043.3 LARD COMPOUNDS AND LARD SUBSTITUTES

American Hospital Assn., 28-7. Lard Substitutes. Covers two types and one grade. Based on U. S. Gov. Federal Specifications EE-L-101a, and Amendment 3, for lard substitutes, referred to below.

U. S. Gov., Federal Specification EE-L-101a; 1934. Amendment 3; 1940. Lard Substitutes. Covers one grade and two types—(I) prepared from refined or deodorized oils or fats, hydrogenated in whole or in part; and (II) prepared with not less than 15 percent oleo stearine, and special requirements when purchased for use in the Tropics. Gives general and detail requirements; methods of inspection and tests (chemical analysis in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, standard pack, *see* 043.0; food regulations, *see* 040., 043.0; vegetable shortening, *see* 142.95.

045. STEARINE AND STEARIC ACIDS

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Stearine and D Activated Animal Sterol. Stearine is the solid material obtained by filtration from animal or vegetable oil after chilling or freezing in the process of refining. D activated animal sterol is a product which is obtained by activation of a sterol fraction of animal origin with ultra-violet light or other means.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Stearic Acid. Description, solubility, congealing temperature, mineral acid, iodine value, neutral fat or paraffin, and storage.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-448A; 1932. Compound; Stearine, Type IC-3.

046. ANIMAL WAXES

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-26; 1927. Beeswax Compound. For use in moisture-proofing formed ends of textile-insulated cables, half beeswax and half cerasin or paraffin, requirements for purity, color, melting point, tests, and packing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Beeswax. Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

Toilet Goods Assn., Inc. Specification No. 9; 1941. Beeswax. Gives requirements for color, odor, taste, melting point, specific gravity, refractive index, saponification value, acid value, ester value, radio number, iodine value, rancidity, fracture, added fats or fatty acids, Japan wax, rosin, soap, carnauba wax, stearic acid, paraffin, ceresin, moisture, ash, solubility and emulsifying properties.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Cerate (Simple Cerate)—Rosin Cerate (Resin Cerate). Preparations and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. White Wax (Bleached Beeswax). Description, acid value, ester value, other characteristics, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Yellow Wax (Beeswax). Description, solubility, specific gravity, melting point, carnauba wax, fats or fatty acids, Japan wax, rosin or soap, acid value, ester value, and storage.

U. S. Gov., Federal Specification C-B-191; 1942. Beeswax; Technical-Grade. Covers one grade and type, in cakes weighing approximately one pound, intended for use for industrial purposes such as in polishes, leather dressings, etc. Gives detail requirements as to specific gravity, softening point, acid number, saponification number, ratio number, and rosin; methods of sampling, inspection, and tests; and requirement for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52B4d; 1941. Beeswax.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-35A; 1940. Wax; Waterproofing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-447; 1928. Compound; Beeswax Type IC-2. Use for impregnation.

047. WOOL FAT

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Hydrous Wool Fat. Description, solubility, loss on drying, reaction, petrolatum, other requirements, iodine value, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Wool Fat. Description, solubility, melting point, loss on drying, ash, free alkalies, water-soluble acids or alkalies, chloride, ammonia, glycerin, soluble oxidizable impurities, petrolatum, acid value, iodine value, and storage.

050-059 HIDES AND SKINS, RAW

(Except Furs)

051. CATTLE HIDES AND SKINS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Calf and Kip Skins. Covers definition, derivation, uses, grades, packing, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Hides

(Cattlehides). Covers definition, characteristics and derivation, grades, packing, uses, and substitutes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative Market Classes and Grades of Butcher and Country Green Salted Cattle Hides, 1932. Covers two classes—unbranded and branded; four sub-classes—extremes, buffs, heavies, and bulls; and four grades—No. 1, No. 2, No. 3, and reject. Gives requirements for each grade and chart showing outline of hide having regular pattern.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative Market Classes and Grades of Green Salted Kips and Calfskins. Revised, 1931. Gives requirements for three kinds—veal, buttermilk, and grassers; four classes—A, B, C, and D; four grades—Nos. 1, 2, 3, and 4; cure, condition and tare, and definitions.

052. HORSE HIDES

053. SHEEP SKINS, RAW

060-069 LEATHER AND LEATHER MANUFACTURES

060. GENERAL ITEMS

American Leather Chemists Assn. Methods of Sampling and Analysis. Chrome Tanned Leathers, 1938. Gives requirements for sampling, preparation of sample for analysis, and analysis.

American Leather Chemists Assn. Methods of Sampling and Analysis. Physical Testing of Leather, 1942. Gives requirements for sampling and conditioning leather for physical tests and methods for measuring the tensile strength of leather, abrasive resistance of heavy leather, flexibility of leather, tearing strength of leather, bursting strength of leather, dimensions of leather, resistance of leather to cracking and piping, shrinkage temperature of leather, fastness of colored leather to light, abrasive resistance of light leather, elongation of leather, permeability of leather to water vapor, and tendency of colored leather to bleed.

American Leather Chemists Assn. Methods of Sampling and Analysis, Vegetable Tanned Leathers. Adopted, 1942. Gives requirements for sampling, preparation of sample for analysis, and analysis.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Leathers, Tentative Methods. For vegetable tanned leather, preparation of sample, determination of moisture, total ash, insoluble ash, petroleum benzine extract, mineral acidity, extraction of water-soluble material, glucose, soluble solids, soluble non-tannins, soluble tannin, nitrogen, hide substance, combined tannin.

Tanners' Council of America. Dictionary of Leather Terminology, 1941. Gives raw materials of tanning industry and leather produced therefrom including cattle group; sheep and lamb group; goat and kid group; equine group; buffalo group; pig and hog group; deer group; kangaroo and wallaby group; aquatic group; and minor classes. Defines about 160 terms in general use in the leather industry.

References.—Tanning materials, *see* 231, 809.1.

061. UPPER LEATHER, EXCEPT PATENT

061.1 ELK LEATHER

061.2 GOATSKIN

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Goat and Kid Skins. Covers definition, derivation and characteristics, uses, grades and marketing, packaging, and substitutes.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-24a-2; 1944. Leather; Goatskin.

061.3 HORSEHIDE LEATHER

U. S. Gov., U. S. Army, Army Air Forces. Specification 9-77-B;. 1941. Leather; Horsehide (Chrome Tanned).

061.4 KANGAROO LEATHER

061.5 OIL GRAIN LEATHER

061.6 PIGSKIN

U. S. Gov., Army Air Forces. Specification No. 12019; 1934. Leather; Pigskin (Carpincho).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-26; 1926. Leather; Pigskin, Russet.

061.7 SHEEPSKINS, CHAMOIS SKIN

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes recommendations for quality, size, and chamois for use in spotting department.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Sheep and Lamb Skins. Covers definition, characteristics and derivation, uses, grades, packing, and substitutes.

U. S. Gov., Army Air Forces. Specification 12029A-2; 1944. Leather; Sheepskin, Chrome Tanned.

U. S. Gov., Army Air Forces. Specification 12037 (1); 1944. Leather; Doeskin (Processed Lamb).

U. S. Gov., Army-Navy Aeronautical Specification AN-S-35-3; 1944. Shearling; Sheep.

U. S. Gov., Federal Specification KK-S-416a; 1942. Amendment 1; 1943. Skins; Chamois. Covers two grades and two types—(A) untrimmed skins and (B) trimmed "pocket-shaped" skins. Gives requirements for material, selection, color, finish, tannage, thickness, tensile strength, stretch, chemical composition, and sizes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 8-96-C; 1941. Shearling; Lamb.

U. S. Gov., U. S. Army, Army Air Forces. Specification 8-137; 1943. Lambskin; Baby.

U. S. Gov., U. S. Army. Army Air Forces. Specification 9-64; 1929. Leather; Sheepskin.

References.—Sheep skins, raw, *see* 053.

061.8 STEER HIDES

References.—Steer hides, raw, *see* 051.

061.9 MISCELLANEOUS LEATHER

U. S. Gov., Army Air Forces. Specification 12038 (1); 1944. Leather; Deerskin (Chrome Tanned).

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-70; 1930. Leather; Calfskin, for Gas-Mask Face Pieces.

062. PATENT, ENAMELED, JAPANNED, OR VARNISHED UPPER LEATHER

063. SOLE LEATHER

063.3 SOLE LEATHER, HEMLOCK TANNED

References.—See 063.6.

063.6 SOLE LEATHER, OAK AND VEGETABLE TANNED

U. S. Gov., Federal Specification KK-L-261b; 1941. Leather; Sole (Cut, Outer, and Top-Lift), Vegetable-Tanned, Factory. Recognizes one grade of leather in backs and bends, and one grade in cut soles and shoe lifts. Grade is determined by visual observation of number, kind, and location of defects. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment. Emergency alternate Federal Specification E-KK-L-261b; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for grade of cut soles and top lifts, material, water solubles, and grease.

References.—Methods of sampling and analysis, *see* 060.

064. GLOVE LEATHER

064.1 HORSEHIDE GLOVE LEATHER

U. S. Gov., Marine Corps Specification, adopted 1939. Leather, Horsehide Fronts; Oil and Water Risistant (for the Manufacture of Gloves).

065. ROUGH TANNED LEATHER

065.1 COWHIDE

U. S. Gov., Army Air Forces. Specification 12028-C; 1941. Leather; Cattle Hide (Chrome Tanned).

References.—Cowhides, raw, *see* 051.

065.2 HARD RAWHIDE

U. S. Gov., U. S. Army, Army Air Forces. Specification 9-41-A; 1926. Leather; Rawhide.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-28; 1926. Rawhide; Hard.

066. HARNESS, BELTING, AND MISCELLANEOUS LEATHER

066.0 GENERAL ITEMS

American Leather Belting Assn. Horse Power Ratings for Oak Tanned Flat Leather Belting, 1940. Gives table I—horse power per inch of width; table II—correction factor for small pulley diameter; table III—service correction factors including atmospheric condition, angle of center line, pulley material, service, peak loads, and peak load factors for electric motor drives; table IV—thickness specifications; and examples showing calculations.

American Leather Belting Assn. Short Center Leather Belt Drive Data. Third Edition, 1940. Covers advantages, efficiency, comparative first costs, drive selection tables, general suggestions for drive selection, A.L.B.A. basic horsepower tables, list prices of endless leather belts, belt life, and installation and operation instructions.

066.1 HARNESS LEATHER

U. S. Gov., Federal Specification KK-L-171a; 1941. Amendment 1; 1944. Leather; Harness, Black and Russet (Vegetable-Tanned). Covers three grades—A, B, and C; two classes—(1) sides and (2) backs; and four weights—(a) light, (b) medium, (c) heavy, and (d) extra heavy. Gives requirements for material, trim, tolerance, splitting, finish, color, crackiness, tensile strength, stretch, and chemical requirements; methods of sampling, inspection. and tests; and packing and marking for shipment.

066.2 HYDRAULIC LEATHER

U. S. Gov., Federal Specification KK-L-177; 1942. Leather; Hydraulic-Packing, Mineral-Tanned (Regular and Non-Corrosive). Covers three classes—(A) medium, (B) heavy, and (C) extra heavy; two types—(I) regular and (II) non-corrosive; and shall be in the form of butt bends. Gives requirements for trim, tannage, selection, thickness, finish, impregnation, crackiness, tensile strength, stretch, shrinkage, and chemical composition; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification KK-L-181a; 1943. Leather; Hydraulic-Packing (Vegetable-Tanned). Applies to leather in the form of butt ends or sides, in three classes—(A) light, (B) medium, and (C) heavy. Gives requirements for tannage, trim of butt end, trim of side, selection, finish, crackiness, tensile strength, stretch, water absorption, chemical requirements, and thicknesses; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 33L3b; 1944. Leather; Hydrualic-Packing, Mineral-Tanned.

U. S. Gov., U. S. Army, Ordnance Department. Specification 9-5A; 1941. Leather; Gasket, Special Mineral Tanned (for Recoil Mechanisms).

References.—Methods of analysis, *see* 060.

066.3 LEATHER BELTING

American Petroleum Institute, Div. of Production, Standard No. 1; 1940. Belting Specification. Gives physical and dimensional stipulations on finished belting of the following types: Leather, impregnated stitched cotton fabric, solid woven hair, solid woven cloth, balata, rubber, cord, and V-belts and sheaves. Also gives minimum and maximum requirements as to tensile strength, elongation under definitely prescribed loads, and permissible variations in physical dimensions; leather belting must meet certain cracking and piping tests, and the adhesion between piles of rubber and balata belting must meet specified limits.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Belting (Leather). Covers definition, quality classification, weight classification, construction, glues and cements, uses, standard widths, specifications, and ordering instructions.

U. S. Gov., Federal Specification KK-B-201a; 1942. Amendment 2; 1944. Belts and Belting; Flat, Leather, Vegetable-Tanned. Covers one grade, made from center stock, and two classes—(I) single-ply and (II) double-ply. Gives requirements for leather, selection, construction, dimensions, straightness, crackiness, piping, tensile strength, stretch, chemical requirements, and cementing; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification KK-B-211a; 1944. Belting; Round, Leather, Vegetable-Tanned, Smooth. Covers one grade. Gives requirements for material, workmanship, defects, finish, number of pieces per spool, size and dimensions, strength, crackiness, chemical composition, grease, ash, acidity; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, adopted 1936. Belting; Leather, Round.

References.—Methods of analysis, *see* 060; rubber belting, *see* 207.3; cotton belting, *see* 314.1.

066.4 LEATHER LACING

U. S. Gov., Federal Specification KK-L-201a; 1942. Amendment 1; 1944. Leather; Lace. Covers one grade; three types—(A) alum-tanned, (B) alum and vegetable-tanned, and (C) chrome-tanned; and two classes—(I) sides and (II) cut laces. Gives requirements for material and workmanship, grade, tannages, sides, finish, cutting, thickness, width, length, strength, stretch, crackiness, shrinkage, and chemical composition; methods of sampling, inspection, and tests; and packing and marking for shipment.

References.—Methods of analysis, *see* 060.

066.5 LEATHER PACKING

References.—Packing leather, *see* 066.2.

066.6 STRAP LEATHER

U. S. Gov., Dept. of Commerce, National Bureau of Standards, Commercial Standard CS34-31; 1931. Bag, Case, and Strap Leather. A commercial standard selected and accepted by industry establishing standard thicknesses and tolerances for leathers used in traveling bags, brief cases, suitcases, pocketbooks, and straps, using Woburn standard gage for measuring. Initiated by Tanners Council of America.

U. S. Gov., Federal Specification KK-L-271a; 1943. Leather; Strap, Black and Russet. Covers four grades—A, B, C, and D; five classes—(1) sides, (2) backs, (3) bends, (4) double shoulders, and (5) straps. Gives requirements for material, trim, thickness, color, finish, fastness of color, crackiness, tensile strength, stretch, and chemical requirements; method of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Marine Corps Specification, revised 1941. Leather; Curried 36-in. Centers, Dark Brown Mahogany Shade.

U. S. Gov., U. S. Army, Army Air Forces. Specification 9-29-A; 1929. Leather for Pads, Safety Belt Straps, etc.

066.7 UPHOLSTERY AND ARTIFICIAL LEATHER

American Hospital Assn., 67-127. Artificial (Upholstery) Leather. Covers 3 types. Based on U. S. Gov. Federal Specifications KK-L-136a, and Amendment 1, for Artificial (Upholstery) Leather (referred to below); UU-P-268a, and Amendment 1, for Wrapping Kraft Paper; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; and NN-B-621a, and Amendment 1, for Nailed and Lock-Corner Wood Boxes.

American Hospital Assn., 67-130. Upholstery Leather. Covers 2 grades and 4 types. Based on U. S. Gov. Federal Specification KK-L-291, and Amendment 1, for upholstery leather, referred to below.

Tanners' Council of America. Specifications for Upholstery Leather, 1935. Requirements for raw material, defines top grains, hand and machine buffs, deep buffs, and splits, for two grades of hides, tensile strength, and marking.

U. S. Gov., Army Air Forces. Specification 12026-A (3); 1942. Leather; Artificial (Rubber-Base, Fire-Proof).

U. S. Gov., Federal Specification KK-L-136a; 1940. Amendment 1; 1941. Leather; Artificial (Upholstery). Covers two types—(I) pyroxylin or cellulose acetate coated and (II) rubber coated; and one grade—"firsts." Gives requirements for material, workmanship, resistance to water, color, width, length, finish, flexibility of coating, physical properties, adhesion of coating film to backing, and aging test; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency alternate Federal Specification E-KK-L-136A; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) deletes requirements for type 2 and gives requirements for an added type 3 (synthetic resin-coated).

U. S. Gov., Federal Specification KK-L-291a; 1943. Amendment 2; 1944. Leather; Upholstery. Covers two grades, two classes, and four types. Dry, brined or green salted hides may be used and upholstery leather shall be furnished in the form of whole hides. Gives requirements for dyeing, coating, thickness, comparison sample, crackiness, tackiness, crocking, tensile strength, stretch, acidity, and grease; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 34L13; 1944. Leather; Artificial, Fire-Resistant (for Upholstery).

References.—Methods of analysis, *see* 060; cellulose acetate and cellulose nitrate products, *see* 846.5.

066.8 RIGGING LEATHER

U. S. Gov., Federal Specification KK-L-241a; 1942. Amendment 1; 1944. Leather; Rigging. Covers one grade and three classes—(A) light, (B) medium, and (C) heavy. Gives requirements for trim, selection, tannage, finish, thickness, cracking, tensile strength, stretch, and chemical composition; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of analysis, *see* 060.

066.9 MISCELLANEOUS SPECIFICATIONS FOR HARNESS BELTING, AND OTHER LEATHERS

Society of Automotive Engineers. Aeronautical Material Specification 3500A; 1942. Leather; Hot Oil and Gasoline-Resistant. For chrome retan leather suitable for use at high temperature and/or in contact with oil and gasoline. Gives requirements for tanning, quality, requirements, tests, tolerances, samples, reports, identification, approval, and rejection.

U. S. Gov., Federal Specification KK-L-151b; 1943. Leather; Bag. Consists of the grain or first cut from a hide; furnished in the form of sides in two grades—A and B; and in three classes—(A) light, (B) medium, and (C) heavy. Gives requirements for material, workmanship, trim of side, area, color, finish, thicknesses, tolerances, stretch, crackiness, fiber appearance, and chemical requirements; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Federal Specification KK-L-166a; 1942. Amendment 1; 1944. Leather; Case. Covers two grades—A and B; and three types—(I) smooth, (II) hand boarded, and (III) machine grained. Gives requirements for hides, tannage, color, finish, area, thickness, tolerance, crocking, cracking, tensile strength, and chemical composition; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1052: 1942. Bag BG-82.

U. S. Gov., Veterans Administration. Specification VA-X-54e; 1941. Leather for Crafts Work.

References.—Methods of analysis, *see* 060.

067. LEATHER FOOTWEAR

067.0 GENERAL ITEMS

Textile Color Card Assn. of The U. S., Inc. Standard Ninth Edition Color Card, 1944. A new master color card for all industries and trades. This is not a card presenting fashion colors for but one season only, but it embraces a complete collection of important staple shades having continued popular acceptance. A Research Associate has been established at the National Bureau of Standards to include the calibration of the 216 colors contained in the Ninth Edition of the Standard Color Card of America and the translation of these standards into the language of scientific equivalents and nomenclature.

Textile Color Card Assn. of the U. S., Inc. Shoe Colors, 1944. The 1945 spring shoe and leather colors—eight colors for women's shoes (including black and white) and four colors for men's shoes (including black and white).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C419; 1938. Shoe Constructions. Covers introduction, what the consumer is buying, United Shoe Machinery Corporation classification, description of various types of shoe construction, discussion of construction classification, consumer value of construction marking on shoes, performance of shoes, summary, and references.

U. S. Gov., War Dept. Army Regulations 850-125; 1942. Foot Measuring and Shoe Fitting. The application of established, practical methods of foot measuring and shoe fitting. Gives requirements for responsibility, shoe size and width record, foot-measuring and shoe-fitting room, machines and devices, operation of foot-measuring machines, final shoe-fitting check, use of short shoe detectors, fitting shoes when foot-measuring machine unavailable, special measurement shoes, and breaking in shoes.

067.1 SHOES

American Standards Assn., Z41.1-1944. Specifications for Protective Occupational Footwear. Men's Safety-Toe Shoes (American War Standard). Intended to provide protection to the toes of the wearer and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, safety toe-box, identification, and notes.

American Standards Assn., Z41.2-1944. Specifications for Protective Occupational Footwear. Women's Safety-Toe (Oxford) Shoes (American War Standard). Intended to provide protection to the toes of the wearer and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, safety toe-box, identification, and notes.

American Standards Assn., Z41.3-1944. Specifications for Protective Occupational Footwear. Men's Conductive Shoes (American War Standard). Intended to provide protection to wearers and property from electricity accumulated in the bodies of wearers, and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, conductivity-electrical resistance, identification, and notes.

American Standards Assn., Z41.4;1944. Specifications for Protective Occupational Footwear. Men's Explosive-Operations (Non-Sparking) Shoes (American War Standard). Intended to provide protection to wearers and property from sparking hazards and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, and identification.

American Standards Assn., Z41.5-1944. Specifications for Protective Occupational Footwear. Men's Electrical-Hazards Shoes (American War Standard). Intended to provide protection to the wearer from certain electrical hazards, to provide protection to the toes of the wearer, and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, electrical properties, and identification.

American Standards Assn., Z41.6-1944. Specifications for Protective Occupational Footwear. Men's Foundry (Molders) Shoes (American War Standard). Intended to provide protection to the foot of the wearer against hazards existant in the handling of molten metal and in similar operations, and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, and identification.

American Standards Assn., Z41.7-1944. Specifications for Protective Occupational Footwear. Women's Safety-Toe (High) Shoes (American War Standard). Intended to provide impact protection to the toes of the wearer, to afford ankle-high coverage for use in welders' and other industrial occupations, and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, safety toe-box, and identification.

American Standards Assn., Z41.8-1944. Specifications for Protective Occupational Footwear. Women's Explosive-Operations (Non-Sparking) Shoes (American War Standard). Intended to provide protection to wearers and property from sparking hazards, and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, and identification.

American Standards Assn., Z41.9-1944. Specifications for Protective Occupational Footwear. Women's Conductive Shoes (American War Standard). Intended to provide protection to wearers and property from electricity accumulated in the bodies of wearers, and to conserve critical materials during the war effort. Gives general requirements, material and workmanship, conductivity-electrical resistance, identification, and notes

U. S. Gov., Army Air Forces. Specification 3234-1; 1944. Shoes; Flying, Light, Combat, Type E-1, Composition Sole.

U. S. Gov., Army Air Forces. Specification No.3235; 1944. Shoes; Flying Light, Combat, Type E-2, Leather Sole.

U. S. Gov., Marine Corps Specification, revised 1943. Shoes; Leather, Field.

U. S. Gov., Navy Dept. Specification 72S1e; 1941. Shoes; Leather, Black.

U. S. Gov., U. S. Army, Army Air Forces. Specification 9-79-C; 1937. Shoes; Aircraft Riggers', Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3088-A; 1941. Shoe; Winter, Type A-7 (Inserts).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3122; 1942. Shoes; Winter Flying, Type A-10 (Pilot's).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3131; 1942. Shoes; Winter Flying, Type A-11 (Pilot's).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 9-96; 1943. Footwear; Protective, Occupational.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-3A; 1932. Shoes; Welt, Army Nurses'.

References.—Elastic shoe goring, *see* 394.5.

067.2 BOOTS

U. S. Gov., Marine Corps Specification, revised 1942. Boots; Leather, for Parachute Jumpers.

U. S. Gov., U. S. Army, Quartermaster Corps. Specifications 9-63-A; 1933. Boots; Leather, Laced, for Mounted Enlisted Men.

References.—Rubber boots, *see* 203.11.

067.3 SLIPPERS

067.4 MOCCASINS

067.5 MUCKLUCKS

067.6 HALF SOLES OR TAPS, INSOLES, OUTSOLES, SLIPSOLES

U. S. Gov., Army Air Forces. Specification 3236-1; 1945. Shoe-Insert; Flying, Electric, Type Q-1.

U. S. Gov., Treasury Dept., Procurement Div., No.559; 1942. Heel Bases; Leather, Women's Shoe. Covers one type, grade, and style (Cuban). Gives requirements for sizes, height, construction, finish and color, and acidity, methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Sole leather in form of cut soles, backs, bends, and blocks, *see* 063.6.

067.7 SHOE PACS AND COUNTERS

U. S. Gov., Treasury Dept., Procurement Div., No.536; 1942. Counters; Shoe, Fiber. Covers class 1, women's; and class 2, men's. Gives requirements for material, style, sizes, dimensions, flange, scarfs, weight, and tensile strength; methods of sampling, inspection, and test; and packaging, packing, and marking.

067.8 SPECIAL SHOES, ATHLETIC, ETC.

U. S. Gov., Army Air Forces. Specification 3226-2; 1945. Shoe; Women's Intermediate Flying, Type A-16.

U. S. Gov., Marine Corps Specification, adopted 1938. Shoes; Baseball.

U. S. Gov., Navy Dept. Specification 37S2c; 1940. Shoes; Gymnasium.

068. LEATHER GLOVES

068.0 GENERAL ITEMS

National Conservation Bureau in cooperation with National Assn. of Leather Glove Mfrs., Inc., No. 319; 1940. Safety in the Manufacture of Leather Gloves. A survey of the hazards found in the leather glove industry, with recommendations for eliminating or reducing them. Covers tannage, preparation of hides, construction of leather gloves, laying off, cleaning, employees' home work, and conclusion.

068.1 ATHLETIC GLOVES AND MITTENS

National Collegiate Athletic Assn. The Official Boxing Guide, B045, Gloves. Requirements for pattern, weight, thumb length, cuff width, and padding.

068.2 LEATHER WORK GLOVES

American Standards Assn., L18.7 to L18.12-1944. Protective Occupational (Safety) Clothing, Leather and Asbestos Gloves and Mittens (American War Standard). L18.7-1944, Welders' Leather Gauntlet Gloves; L18.8-1944, Protective Leather Gloves, Steel-Staples; L18.9-1944, Asbestos Gloves; L18.10-1944, Asbestos Gloves, Leather Reinforced; L18.11-1944, Asbestos Mittens; L18.12-1944, Asbestos Mittens, Leather Reinforced. Covers scope and purpose, types and sizes, pattern and design, construction, material, methods of test, identification, and appendix for breaking strength of asbestos cloth.

U. S. Gov., Army Air Forces. Specification 3143-3; 1944. Glove; Winter Flying, Type A-11.

U. S. Gov., Army Air Forces. Specification 3184A-3; 1945. Shell; Leather Outer. For types F-2 and F-3 electrically heated flying suits.

U. S. Gov., Army Air Forces. Specification 3185-B; 1944. Shell; Outer, Leather, for Type A-11a Flying Glove.

U. S. Gov., Marine Corps Specification, adopted 1944. Gloves; Leather, Lined.

U, S. Gov., Marine Corps Specification, revised 1942. Gloves; Working.

U. S. Gov., Navy Dept. Specification 37G15; 1939. Gloves; Leather, Unlined.

U. S. Gov., Navy Dept. Specification 37M8; 1944. Mitts; One-Finger, Gauntlet, Leather.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3102; 1941. Gloves; Mechanics', Type D-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3154A; 1944. Glove; Mechanic's Winter, Type D-3A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3191-A; 1944. Shell; Leather (for Type D-3A Glove).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-27; 1925. Glove; Leather, Heavy.

U. S. Gov., U. S. Army, Signal Corps. Specification 9-75-B; 1944. Gloves LC-10 (Limeman's Leather).

068.3 DRESS GLOVES

068.4 RIDING GLOVES

068.5 HAND LEATHERS

U. S. Gov., Federal Specification KK-P-91; 1944. Palms; Sewing (Sailmakers' and Saddlers'). Covers three types—(I) roping, (II) seaming, and (III) sewing. Gives requirements for material, workmanship, general design, identification, finish, bid samples of thread, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-169; 1937. Palm; Sewing.

068.6 MITTENS, LEATHER

American Standards Assn., L18.7 to L18.12-1944. Protective Occupational (Safety) Clothing, Leather and Asbestos Gloves and Mittens (American War Standard). L18.7-1944, Welders' Leather Gauntlet Gloves; L18.8-1944, Protective Leather Gloves, Steel-Stapled; L18.9-1944, Asbestos Gloves; L18.10-1944, Asbestos Gloves, Leather Reinforced; L18.11-1944, Asbestos Mittens; L18.12-1944, Asbestos Mittens, Leather Reinforced. Covers scope and purpose, types and sizes, pattern and design, construction, material, methods of test, identification, and appendix for breaking strength of asbestos cloth.

068.7 GAUNTLETS

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-40C; 1943. Gauntlets; Barbed Wire.

069. MISCELLANEOUS MANUFACTURES OF LEATHER

069.1 ATHLETIC GOODS OF LEATHER

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Shot. For iron sphere or spherical brass shell filled with lead. Leather or soft bag or container filled with lead for indoor competition.

National Basketball Committee of the U. S. and Canada. Representing the National Collegiate Athletic Assn., National Federation of High School Athletic Assns., Young Men's Christian Assn., Canadian Intercollegiate Athletic Union, Canadian Amateur Basketball Assn. Official Basketball Guide, BB45. Includes materials, size, and weights of balls for adults and for players below senior high school age; requirements for height of bounce; testing for resilience at factory; and stamping with air pressure required to give legal bounce.

National Collegiate Athletic Assn. Official Foot Ball Guide, FB44. Ball. Requirements for materials of cover and bladder, construction, color, inflation pressure, shape, size, dimensions, and weight.

National Collegiate Athletic Assn. Official Soccer Guide, SO44. Ball. Requirements for casing, circumference, weight, and inflation pressure.

National Football League. Official Football Rules. Ball. Requirements for materials of cover and bladder, construction, color, inflation pressure, shape, size, dimensions, and weight.

United States Volley Ball Assn. Volley Ball Official Guide, VB45. Ball. Includes requirements for shape, covering, size, weight, and air pressure.

References.—Baseball gloves, *see* 068.1; rubber goods, *see* 209.9; athletic and sporting goods, *see* 943.9.

069.2 HARNESS AND SADDLERY

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 166. Halter; Leather.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 167. Halter; Rope.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Harness; Plow.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 176. Harness; Saddle, Combination.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 228-S. Latigo.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 306. Saddle; Pack, Crosstree.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-307. Saddle; Pack, Decker.

U, S. Gov., Marine Corps Specification, adopted 1918. Cincha; Pony.

U. S. Gov., Marine Corps Specification, revised 1940. Halter; Horse.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2848; 1939. Halter; Operating, 6-Ring, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2849; 1939. Hood; Humane, Operating, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2853; 1939. Side Line; Horse.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2921; 1939. Harness; Casting, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2922; 1939. Hobble; Complete, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2924; 1939. Sling; Horse, Complete.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 9-57; 1928. Accessories; Pack Load, for browning machine rifle, Cal. 30 M1922 (Set).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-77A; 1938. Equipment; Caparison, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-7B; 1942. Bridle; Halter, M-1917.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-9A; 1937. Saddlebag; M1924.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-13; 1933. Saddle; Pack, Phillips, Cargo, Complete.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-14; 1933. Saddle; Pack, Phillips, Cavalry, Complete.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-15A; 1938. Link; Cavalry.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-22; 1937. Bridle; Training, with Martingale, M-1920.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-24A; 1942. Harness; Ambulance or Escort Wagon, Lead and Wheel, Double Sets.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-26; 1936. Whip; Artillery, M-1913.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-27; 1937. Pad; Collar, Zinc.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-28; 1936. Harness: Machine-Gun Cart, M-1927, Single Set.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-31A; 1941. Halter; M1904, with Tie Rope.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-33; 1937. Cavesson; M1912, Complete.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-34; 1937. Bridle. M1913; Artillery Harness, M1916.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-38; 1937. Hanger; Cargo, Spring Release Type, Pack, Artillery.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-41; 1937. Outfit; Picket Line, M1933.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-42; 1937. Pad; Saddle, Woven, Olive-Drab.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-43; 1938. Collar; Breast, Breeching, and Lead Rope, Veterinary.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-46; 1938. Cinchas; Hair.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-47; 1939. Harness; Artillery, Breast Collar, M1916; Double Set.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-48; 1939. Saddle; McClellan, M1904.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-49; 1939. Girth; Saddle, Mohair Cord.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-50; 1939. Saddle; McClellan, M-1928, Cavalry.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-51; 1939. Saddle; Packers', Riding, Full-Rigged.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-52; 1940. Pocket; Pommel, M-1936, Complete.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-53A; 1942. Bag; Cantle, M-1936.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-56; 1940. Hobble; QM Type.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-58; 1941. Hobble; Breeding M1940.

References.—Saddlers' nails, *see* 608.11; saddlers' tacks, *see* 608.14.

069.3 CLOTHING BELTS, SAFETY BELTS, ETC.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-18; 1938. Leather Body Belts and Safety Straps. For linemen's use, requirements for quality of leather, styles and dimensions, designs for belt, strap, and snap hook, tensile strength, and stiffness tests.

National Safety Council. American Standards Assn., A39-1933. Recommended Practice for Window Cleaning. Applies to all window cleaning operations performed wholly or partially on the outside of all public buildings more than one story high, or in which the sills of windows are located more than 10 ft. above grade or adjoining roof. Requirements when to use approved safety devices. Requirements on swinging scaffolds, boatswain's chair, sectional ladders, belts, belt terminals, and anchors.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-15—2; 1944. Belts; Gunners' Safety.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-314-1. Sheath; Ax, Western Pattern.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-314-2. Sheath; Ax, Young's Pattern.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-314-3. Sheath; Ax, Cruiser Pattern.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-314-4. Sheath; Ax, Boy's Pattern.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-314-5. Sheath; Belt Ax.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-319. Sheath; Pulaski Tool.

U. S. Gov., Dept. of Agriculture, Forest Service, Specifications MSF-321 Sheath; Brush Knife.

U. S. Gov., Federal Specification KK-B-151; 1937. Belts; Linemen's, Safety, Leather. Covers one type and one grade. Consists of a body belt with holster and a safety strap. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Marine Corps Specification, revised 1944. Belt; Service (Without Buckle) Dark Brown Mahogany Shade.

U. S. Gov., Navy Dept. Specification 5B5a; 1941. Belts, Battalion-Flagstaff.

U. S. Gov., Navy Dept. Specification 73B1; 1939. Belts; Sword.

U. S. Gov., Treasury Dept., Procurement Div., 406C; 1941. Belts, Safety Body-Pad Type (with or without Shoulder Harness). Body pad shall be made from 4-ply transmission solidly-woven cotton webbing 48 inches long and not less than 3 inches wide. Gives requirements as to thread, belt proper, D-rings, shoulder harness, and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 419; 1940. Shock Absorbers for Safety Belts. Covers one type and grade, of the following sizes: (I) For indoor use, suitable for 1/2 in. standard manila rope; and (II) for outdoor use, suitable for 3/4 in. standard manila rope. Gives requirements for material, adjustable metal clamp, length, weight, and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 9-74-B; 1936. Belt; Pilots' Safety.

U. S, Gov., U. S. Army, Quartermaster Corps. Specification 9-70A; 1939. Belt; Officer's, M-1921.

References.—Cotton belts, *see* 311.8.

069.4 LEATHER CLOTHING

American Standards Assn., L18.1-1944. Protective Occupational (Safety) Clothing. Leather Aprons (American War Standard). Covers scope and purpose, types, sized and dimensions, pattern and design, construction, materials and workmanship, methods of test, identification, and appendix including drawings.

American Standards Assn., L18.2-1944. Protective Occupational (Safety) Clothing. Leather Cape Sleeves and Bibs (American War Standard). Covers scope and purpose, types, sizes and dimensions, pattern and design, construction, materials and workmanship, methods of test, identification, and appendix including drawings.

American Standards Assn., L18.3-1944. Protective Occupational (Safety) Clothing. Leather Leggings (Knee Length). Covers scope and purpose, type and size, thickness, pattern and design, construction, materials and workmanship, methods of test, and identification.

American Standards Assn., L18.4-1944. Protective Occupational (Safety) Clothing. Leather Coats (American War Standard). Gives scope and purpose, pattern and design, special requirements for men's coats, special requirements for women's coats, construction details, materials and workmanship, methods of test, identification, and appendix.

American Standards Assn., L18.5-1944. Protective Occupational (Safety) Clothing. Leather Overalls (American War Standard). Gives scope and purpose, pattern and design, special requirements for men's overalls, special requirements for women's overalls, construction details, materials and workmanship, methods of test, and identification.

American Standards Assn., L18.6-1944. Protective Occupational (Safety) Clothing. Leather Sleeves (American War Standard). Gives scope and purpose, pattern and design, special requirements for men's sleeves, special requirements for women's sleeves, construction details, materials and workmanship, methods of test, and identification.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-3a; 1943. Jackets; Leather Flying.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-4a; 1944. Jackets; Winter Flying.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-35a; 1944. Trousers; Winter Flying.

U. S. Gov., Federal Specification KK-A-606a; 1943. Aprons; Leather, Blacksmiths'. Covers one grade and three types—(I) vegetable-tanned sheepskin leathers, (II) vegetable-tanned split leathers, and (III) chrome-tanned split leathers. Gives requirements for body leather, strap leather, thread, buttons, construction, tolerances, reinforcing, stitching, seams, detail requirements, and figure showing dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, adopted 1937. Band; Sweat, Leather (with cloth strip attached).

U. S. Gov., Navy Dept. Specification 37C6b; 1943. Clothing; Protective, Leather, for Welders.

U. S. Gov., U. S. Army, Army Air Forces. Specification 8-117; 1940. Vest; Flying, Type C-3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3040; 1932. Jackets; Flying, Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3052; 1933. Helmet; Flying, Intermediate Type A-7.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3053; 1933. Helmet; Flying, Type B-5.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3055-B; 1942. Vest; Winter Flying, Type C-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3085-A; 1941. Trousers; Mechanics' Type B-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3119; 1942. Trousers; Winter Flying, Type A-6 (Pilot's).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3120; 1942. Jacket; Winter Flying, Type B-7 (Pilot's).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3126; 1942. Helmet; Flying (Winter) Type B-6.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-15; 1926. Helmet; Firemen's.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-59; 1928. Leather; Cape.

U. S. Gov., Veterans Administration. Specification VA-MC-310; 1937. Firemen's Helmets (Black).

069.5 LEATHER STRAPS

U. S. Gov., Army Air Forces. Specification No. 3229; 1944. Strap; Navigation Watch Wrist.

U. S. Gov., Marine Corps Specification, revised 1942. Sling; Gun, Leather, for M-1903 Rifle (Dark Brown Mahogany Shade).

U. S. Gov., Marine Corps Specification, revised 1942. Strap; Wrist Watch.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-56A; 1938. Straps; Chin, Leather, Hat.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-82-A; 1942. Straps; Spur, M-1926, and Guard; Stirrup.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-84A; 1941. Strap; Shoulder, Military Police.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-19; 1933. Strap; Saber, Long and Short.

U. S. Gov., U, S. Army, Signal Corps. Specification 71-603; 1931. Strap; Type ST-26, Leather. 16-in.

References.—Lineman's safety straps, *see* 069.3.

069.6 BELLOWS LEATHER

069.7 LEATHER CASES

U. S. Gov., Federal Specification KK-B-50; 1936. Amendment 1; 1944. Bags; Hand, Leather. Covers one grade; two types—(I) with suitcase bottom and (II) without suitcase bottom; and two classes—(A) 16 in. and (B) 18 in. Gives requirements for leather, lining and pockets, thread, metal, stitching, sizes, color, pockets, locks and hasps, handle, feet, and construction; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification KK-C-121a; 1942. Amendment 2; 1944. Cases; Brief, Leather. Covers eight types—(I) lawyer, (II) special lawyer, (III) secretary, (IV) special secretary, (V) investigator, (VI) inspector, (VII) brief bag, and (VIII) catalog. Gives requirements for leather, thread, steel, tolerances, fronts, backs, flaps, straps, loops, gussets, partitions, color, sizes, pockets, locks, fasteners, buckles, handles, construction, lining, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification KK-E-561; 1935. Envelopes; Leather. Covers two Classes—(I) letter size and (II) legal size. Gives detail requirements for material, workmanship, color, sizes, thickness, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, adopted 1944. Handbag (With Shoulder Strap). (Marine Corps Women's Reserve).

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2967; 1939. Bag; Leather, Obstetrical.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-18; 1926. Pouch; Music.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-68-A; 1937. Case; Needle (Leather).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-71A; 1939. Scabbard; Rifle, M-1918.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-86A; 1941. Scabbard; Rifle, M-1938.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-90A; 1941. Scabbard; Sub-Machine Gun, M-1940.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-92; 1941. Sheaths; Butcher Knife, Paring Knives, and Cleaver (outfit, cooking, mountain artillery).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-432C; 1932. Pouch; Type CS-34, for Carrying Knife and Pliers, Leather.

U. S. Gov., Veterans Administration. Specification VA-G-63a; 1936. Leather Portfolio (for portable typewriter).

069.9 MISCELLANEOUS SPECIFICATIONS FOR LEATHER MANUFACTURES

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Leather, Bookbinding. Covers definition, manufacture, types of leather, splits, calfskins, buffings, sheepskins, skivers, goatskins, pigskins, and purchasing.

Society of Automotive Engineers. Aeronautical Material Specification 3500A; 1942. Leather (Hot Oil and Gasoline Resistant). Chrome retan leather suitable for use at high temperatures and/or in contact with oil and gasoline. Gives requirements for tanning, quality. tests, tolerances, samples, reports, identification, approval, and rejections.

U. S. Gov., Federal Specification KK-H-566a; 1939. Holsters; Pistol, Leather. Covers two types: (I) Open-end (class A—pocket with safety strap, class B—open-pocket, and class C—extended belt-loop, with safety strap); and (II) closed-end (class A—pocket with safety strap, class B—open-pocket, and class C—pocket with flap). Gives requirements for material, workmanship, leather, stitching, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification KK-W-231; 1936. Welting; Leather, Shoe. Covers one grade. Gives requirements for leather, color, finish, hanks, width, thickness, fillet strips, laps, cement, and grooving; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, revised 1939. Drumheads; Batter and Snare.

U. S. Gov., Marine Corps Specification, adopted 1943. Holster; Shoulder, Pistol.

U. S. Gov., Marine Corps Specification, revised 1944. Sheath; Leather, for Knife, Hospital Corps.

U.S. Gov., Navy Dept. Specification 29S1; 1943. Strops; Razor (All-Leather).

U.S. Gov., Navy Dept. Specification 54B3; 1928. Bags; Money, Leather.

U.S. Gov., Navy Dept. Specification 54B5; 1936. Bags; Money, Leather (Suitcase Type).

U.S. Gov., Navy Dept. Specification 73B2; 1941. Bands; Sweat, Cap (Leather).

U. S. Gov., U. S. Maritime Commission. Specification 34-MC-1; 1944. Holsters; Pistol, Leather. Covers one grade and size. Gives requirements for materials, workmanship, construction, leather, color, stitching and thread, and metal parts; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-92A; 1942. Disk; Leather.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-13; 1926. Drumheads; Snare, Tympani and Bass.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-4A; 1937. Blinder, M-1916.

References.—Sandblasting helmets, protective shields, and goggles of leather, *see* 914.5.

070-079 FURS

071. UNDRESSED FURS

073. FURS DRESSED ON THE SKIN

U. S. Gov., Army Air Forces. Specification No. 16086; 1934. Pelts; Reindeer, Fawn.

075. MANUFACTURES OF FUR AND FUR SKINS

075.1 PARKA

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 21-1; 1925. Parka; Fur. Alaskan Clothing.

075.2 FUR ROBES

075.3 FUR MITTENS

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 33-1A; 1926. Mitten; Fur, Alaskan Clothing.

075.4 FUR CAPS

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 33-7A; 1941. Cap; Winter, Lambskin-Lined.

090-099 MISCELLANEOUS ANIMAL PRODUCTS

091. BONES, HOOFS, AND HORNS

092. FEATHERS AND MANUFACTURES

092.1 FEATHERS

American Hospital Assn., 1-13. Feathers. Covers chicken, duck, and goose feathers. General requirements, detail requirements, and methods of inspections and tests. Bases on U. S. Gov. Federal Specification C-F-151a for Feathers, referred to below.

U. S. Gov., Federal Specification C-F-151a; 1940. Feathers. Covers 1 grade in 3 types—(I) chicken, (II) duck, and (III) goose. Gives requirements for material and workmanship; general requirements for odor, brittleness, damaged feathers, and cleanness; detail requirements for each type of feathers; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

092.2 FEATHER DUSTERS

092.9 MISCELLANEOUS MANUFACTURES OF FEATHERS

References.—Feather pillows, *see* 315.33.

093. GLUE STOCK, GLUE, AND GELATIN

093.0 GENERAL ITEMS

American Society for Testing Materials, D773-44T. Tentative Method of Test for Adhesiveness of Gummed Tape.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Glue (Animal Glue). Covers definition, derivation, uses, grades, containers, and substitutes.

093.1 GLUE STOCK, INCLUDING HIDE CUTTINGS, ETC.

093.2 CASEIN GLUE

U. S. Gov., Army Air Forces. Specification 14122 (1); 1943. Glue; Water and Mold Resistant Casein.

U. S. Gov., Federal Specification C-G-456; 1941. Glue; Casein-Type, Water-Resistant. Covers one type and grade in the form of a dry uncaked powder. Gives detail requirements for shear test, working life, and setting properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52G6c; 1936. Glue; Marine (Ship).

U. S. Gov., Navy Dept. Specification 52G8c; 1941. Glue; Casein, Water-Resistant.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-14024; 1934. Glue; Certified Casein Water-resistant, Application of.

093.3 FLAKE GLUE

U. S. Gov., Federal Specification C-G-451; 1931. Glue; Animal, for Woodworking. Covers six grades (V1, V2, J1, J2, S1, and S2) in flake, ground, or other form. Gives requirements for material and workmanship, moisture, content, jelly strength, viscosity, reaction foam, odor, and keeping quality; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, *see* 093.0.

093.4 HIDE GLUE

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-21001-D; 1931. Glue; Hide, Handling and Testing Glued Joints, Aircraft.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-102D; 1941. Glue (for use in the loading of ammunition).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-112; 1943. Glue; Hide (for Use in the Manufacture of Primers).

093.5 PATTERN MAKER'S GLUE

093.6 LIQUID GLUE

U. S. Gov., Army Air Forces. Specification 14095-A; 1941. Glue; Liquid.

U. S. Gov., Federal Specification C-G-463; 1941. Glue; Liquid. Covers one type and grade for use primarily as an adhesive for wood. Gives detail requirements as to consistency, keeping qualities, hydroscopicity, and adhesive strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-4; 1924. Glue; Liquid, Photoengravers'.

093.7 GELATIN

American Chemical Society. Journal of Industrial and Engineering Chemistry, Jan. 15, 1929. Committee Recommendation. Tentative Specifications for Standard Gelatin. For standard gelatin for physicochemical purposes, of calfskin source, requirements on preparation, ash content, qualities, content of heat coagulable protein, etc.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Gelatin. Covers definition, constants, solubility, derivation, uses, forms and grades, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A. Twelfth Revision, 1942. Gelatin. Description, solubility, identification, odor and water-insoluble substances, sulfite, arsenic, heavy metals, gel strength, bacterial content, and storage. U. S. P. product of gelatin—Gelatinum Glycerinatum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A. Twelfth Revision, 1942. Glycerinated Gelatin. Preparation and storage.

U. S. Gov., Federal Specification C-G-191a; 1937. Amendment 3; 1940. Gelatin, Dessert—Powder and Plain; and Starch-Dessert-Powder. Covers three types—(I) gelatin, plain (unflavored), powdered, (II) dessert powder (flavored), prepared with gelatin, and (III) dessert powder (flavored), prepared with starch. Gives general requirements for each type; method of inspection and test (bloom gelometer test in accordance with methods of the Edible Gelatin Manufacturers' Research Society of America and chemical analysis in accordance with methods of Assn. of Official Agricultural

Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1070; 1937. Gelatin; Granular (for Culture Media).

References.—Methods of testing glue, *see* 093.0.

093.9 MISCELLANEOUS SPECIFICATIONS FOR GLUE, ETC.

References.—Methods of testing glue, *see* 093.0.

094. SAUSAGE CASINGS

095. IVORY

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Ivory. Covers definition, derivation, uses, grades, packaging, and substitutes.

096. SHELLS

097. SPONGES

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sponge and Fresh Water Sponge. Natural order, synonyms, description, habitat, history, parts used, and preparation for tincture, dilutions, and medications for use in homoeopathic medicines.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Sponges. Covers definition, characteristics, derivation, marketing, packing and grading, grades, and substitutes.

U. S. Gov., Federal Specification C-S-631b; 1941. Sponges; Natural. Covers fresh stock, best quality sponges, eleven types, in two classes (unbleached and bleached)—(I) Rock Island sheepswool middle range forms No. 1, (II) Florida key sheepswool forms No. 1, (III) Florida yellow forms No. 1, (IV) Nassau reef forms No. 1, (V) Florida key grass cuts No. 1, (VI) Rock Island sheepswool middle range forms No. 2, (VII) Florida key sheepswool forms No. 2, (VIII) Florida yellow forms No. 2, (IX) Rock Island sheepswool middle range cuts No. 2, (X) Florida key sheepswool cuts No. 2, and (XI) Florida yellow cuts No. 2. Gives general and detail requirements for each type; methods of sampling, inspection, and tests; requirements for packaging, packing, and marking; and lists the more general uses of the various types.

098. ANIMAL PRODUCTS, UNMANUFACTURED, NOT ELSEWHERE CLASSIFIED

098.1 MEAT MEAL, MEAT SCRAPS, BONE MEAL, BLOOD MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Animal Products. Defines blood meal, blood flour, meat, meat by-products, meat meal, meat scraps, digester tankage, meat and bone meal digester tankage, whale meal, animal liver meal, raw bone meal, steamed bone meal, special steamed bone meal, bone charcoal or bone black, and spent bone meal.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Bone; Raw (Granulated Bone, Bone Meal). Covers definition, derivation, uses, grades, containers, and substitutes.

References.—Bone, hoof and horn meal, fish scrap, dried blood, fish scales, as fertilizers, *see* 850. and 859.

099. MANUFACTURED ANIMAL PRODUCTS NOT ELSEWHERE CLASSIFIED

099.1 BOUILLON CUBES AND BEEF EXTRACT

099.2 WOOL AND HAIR AND MANUFACTURES

References.—Wool and woolen products, *see* 360-369.

099.3 SILK AND MANUFACTURES THEREOF

References.—Silk and silk products, *see* 370-379.

099.4 BRISTLES AND MANUFACTURES THEREOF

References.—Brushes, *see* 982.1-982.9.

099.5 CASEIN

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Casein and Casein Plastics. Covers definition, derivation and characteristics, uses, grades and forms, containers, and substitutes.

Technical Assn. of the Pulp and Paper Industry. Analysis of Casein, Standard T607M-44, 1944. Gives requirements for acid and rennet casein. Covers sampling, appearance, moisture, fat, ash, alkali, starch, total acidity, soluble acidity, nitrogen, insoluble matter, solubility, viscosity, and clay-carrying strength.

100-199 VEGETABLE FOOD PRODUCTS

100-109 GRAINS AND PREPARATIONS

100. GENERAL ITEMS

American Assn. of Cereal Chemists. Cereal Laboratory Methods With Reference Tables, 1941. Includes wheat and other whole grains; experimental milling; wheat flour, semolina and similar products; feeds and feeding stuffs; rye; malt; enzymatic, physicochemical and bacteriological methods; baking methods; bread; experimental macaroni processing; macaroni products; fats and shortening materials; leavening agents; yeast foods, bleaching agents, and flour improvers; glossary of cereal chemical terms; statistical principles and experimental errors; preparation and standardization of solutions; reference tables; and moisture correction charts.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Plants. Methods for determination of sand and silica, calcium, magnesium, manganese, sodium and potassium, copper, zinc, sulphur, phosphorus, chlorine, total nitrogen, and tentative methods for moisture, ash, iron, aluminum, arsenic, sugars, sucrose, starch, ether extract, and crude fiber.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes important features of grain inspection. Covers inspection requirements, misrepresentation, appeals, finding, fees, licensing of inspectors, penalties, regulations, basis of inspection, sampling of grains, testing weight per bushel, moisture tests, and equipment used in grain inspection.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes mixed grain. Gives requirements for two grades—"mixed grain" and "sample grade mixed grade"; and definitions and terms.

U. S. Gov., Dept. of commerce, National Bureau of Standards Miscellaneous Publication M147; 1935. Papermaking Quality of Cornstalks. Study of the papermaking quality of cornstalks was made at the National Bureau of Standards to find the practical possibilities of utilizing this form of waste farm product as a raw material for paper. Special mechanical preparation of the stalks was found essential for successful pulping because of certain structural peculiarities of the type of plant stem. The best results were obtained by using only the outside shell or cortex, which had been separated from the remainder and shredded by mechanical processes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Miscellaneous Publication M148; 1935. Separation of Cornstalks Into Long Fibers, Pith, and Fines. The wet method of separating pith from cornstalks was modified to produce three fractions of useful materials. Data on the ash of the various fractions and the thermal conductivities of pith and pith board are given, together with a discussion of the uses to which the materials may be put. The yields are 42.5 percent of long fiber, 5 percent of pith, and 22.5 percent of fines.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Substandard Quality and Fill of Container. General statements of substandard quality and substandard fill of container. Gives details concerning these terms.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Covers eleven classes—(I) wheat, (II) corn, (III) barley, (IV) oats, (V) feed oats, (VI) mixed feed oats, (VII) rye, (VIII) grain sorghums, (IX) flaxseed, (X) soybeans, and (XI) mixed grain. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

101. BARLEY AND BARLEY PREPARATIONS

101.1 BARLEY

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Barley. Covers definition, characteristics and derivation, uses, grades and standards, containers, and substitutes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes barley. Covers four classes: (I) barley—(A) malting barley and (B) barley, (II) black barley, (III) western barley, and (IV) mixed barley. Gives requirements for six grades—No. 1, No. 2, No. 3, No. 4, No. 5, and sample; and definitions and terms.

U. S. Gov., Federal Specification N-B-121; 1931. Barley; Pearl. Covers one grade in No. 2 and No. 3. Gives general requirements; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Includes barley. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of analysis, food regulations, *see* 100.

101.2 BARLEY FLOUR

101.9 MISCELLANEOUS SPECIFICATIONS FOR BARLEY

References.— Barley products as feeding stuffs, *see* 119.9.

102. BUCKWHEAT AND FLAXSEED

102.1 BUCKWHEAT GRAIN

New York Produce Exchange. Grades for Buckwheat. Shall be at least 75 percent of the varieties Japanese and/or silver hull. Gives requirements for No. 1, No. 2, No. 3, No. 4, sample grade, tough, damp, and cool and merchantable buckwheat.

References.—Methods of analysis, food regulations, *see* 100; buckwheat mill feed products, *see* 118.9.

102.2 BUCKWHEAT FLOUR

U. S. Gov., Federal Specification N-F-451; 1931. Flour; Buckwheat. Gives requirements for material, workmanship, and flour; methods of inspection and tests (moisture determination and chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food regulations, *see* 100.

102.3 FLAXSEED GRAIN

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Linseed. Covers definition, derivation, characteristics, uses, grades, marketing and substitutes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes flaxseed. Gives requirements for three grades—No. 1, No. 2, and sample; and definitions and terms.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Includes flaxseed. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Flaxseed oil cake and meal, *see* 112.1.

103. CORN AND GRAIN SORGHUMS AND PREPARATIONS

103.0 GENERAL ITEMS

103.1 CORN

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Corn. Covers definition, derivation, characteristics, uses, classification, grades, containers, and substitutes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes corn. Gives requirements for three classes—(I) yellow, (II) white, and (III) mixed; six grades—No. 1, No. 2, No. 3, No. 4, No. 5, and sample; and definitions and terms.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Includes corn. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of analysis, food regulations, *see* 100, 103.0.

103.2 CORN FLOUR

103.3 STARCH

U. S. Gov., Federal Specification N-C-541; 1930. Cornstarch. Covers one grade and type. Gives general and detail requirements for purity, moisture content, fineness, etc.; methods of inspection and tests; and requirements for packaging, packing, and marking.

References.—Methods of analysis, food regulations, *see* 100.

103.4 CORN MEAL, CORN GLUTEN FEED AND MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Corn Products. Defines corn meal, corn feed meal, corn gluten feed, corn gluten meal, maltose process corn gluten feed, corn germ cake, corn germ meal, and corn screenings.

U. S. Gov., Federal Specification N-C-521; 1931. Amendment 2; 1935. Corn Meal; White or Yellow. Covers one grade and two types—(I) white and (II) yellow. Gives general requirements for quality and preparation; detail requirements for granulated meal; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for corn gluten feed, corn gluten meal, and corn feed meal to conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—Methods of analysis, food regulations, *see* 100, 103.0; corn oil cake, corn oil meal, corn germ cake, corn germ meal, *see* 112.9.

103.5 GRAIN SORGHUMS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes grain sorghums. Covers five classes: (I) White grain—(A) white kafir, (B) white durra, and (C) white grain; (II) yellow grain—(A) yellow milo and (B) yellow grain; (III) red grain—(A) red kafir and (B) red grain; (IV) brown grain; and (V) mixed grain. Gives requirements for five grades—No. 1, No. 2, No. 3, No. 4, and sample; and definitions and terms.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Includes grain sorghums. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of analysis, food regulations, *see* 100.

103.9 MISCELLANEOUS SPECIFICATIONS FOR CORN

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-168B; 1941. Dextrin.

References.—Corn shops and grits, *see* 119.2; table corn, canned corn, *see* 122.2, 126.2.

104. OATS AND OAT PRODUCTS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Grain and Stock

Feeds. Oat Hulls in Oats and Oat Feeds. Tentative methods for determination.

104.0 GENERAL ITEMS

104.1 OATS

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes feed oats and mixed feed oats. Covers four grades—No.1, No.2, No.3, and sample; and definitions and terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes oats. Covers five classes—(I) white, (II) red, (III) grey, (IV) black, and (V) mixed; five grades—No.1, No.2, No.3, No.4, and sample; definitions and terms.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Includes oats, mixed feed oats, and feed oats. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of analysis and tests, food regulations, *see* 104.0, 100.

104.2 OAT FLOUR

References.—Methods of analysis, food regulations, *see* 100; other specifications for oatmeal and rolled oats, *see* 109.4.

104.9 MISCELLANEOUS SPECIFICATIONS FOR OATS

References.—Oats products as mill feeds, *see* 118.9; oatmeal and rolled oats, *see* 109.4.

105. RICE AND RICE PRODUCTS

105.1 RICE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U.S. Standards for Rough Rice, 1942. Covers eleven classes— (I) Edith, (II) Fortuna, (III) Lady Wright, (IV) Rexoro, (V) Nira, (VI) blue rose, (VII) early prolific, (VIII) American pearl, (IX) Calady, (X) miscellaneous classes, and (XI) mixed. Gives requirements for various classes, subclasses, grades, special grades for rough rice, milling quality, and definitions.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Milled Rice, 1942, and Amendment, 1943. Covers fourteen classes—(I) Edith, (II) Fortuna, (III) Lady Wright, (IV) Rexoro, (V) Nira, (VI) blue rose, (VII) early prolific, (VIII) American pearl, (IX) Calady, (X) miscellaneous classes, (XI) mixed, (XII) second head, (XIII) screenings, and (XIV) brewers. Gives requirements for various classes, subclasses, grades, parboiled milled rice, coated milled rice, weevily milled rice, and definitions.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Brown Rice, 1942. Covers eleven classes—(I) Edith, (II) Fortuna, (III) Lady Wright, (IV) Rexoro, (V) Nira, (VI) blue rose, (VII) early prolific, (VIII) American pearl, (IX) Calady, (X) miscellaneous classes, and (XI) mixed. Gives definitions and requirements for various classes and grades.

U. S. Gov., Federal Specification N-R-346; 1943. Rice; Brown. Covers three grades (extra fancy, fancy, and choice) for classes 1 to 7 and (fancy, No.1, and No.2,) for classes 8 and 9; and three types (A) long grain of six classes (Edith—class 1, Fortuna—class 2, Lady Wright —class 3, Rexoro—class 4, Nira—class 5, and Calady—class 9; (B) short grain of three classes (blue rose—class 6, early prolific, class—7, and zenith—class 10); and (C) round grain of one class (American pearl—class 8). Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives requirements for material and workmanship, details, methods of inspection and tests (chemical analyses shall be made in accordance with the methods of the Assn. of Official Agricultural Chemists), packaging, labeling, packing, and marking.

U. S. Gov., Federal Specification N-R-351a; 1943. Amend. 1; 1944. Rice; Milled. Covers four grades—extra fancy (No.1), fancy (No.2), extra choice (No.3), and choice (No.4); and three types—(A) long grain of six classes (Edith, Fortuna, Lady Wright, Rexoro, Nira, and Calady); (B) short grain of three classes (blue rose, early prolific, and zenith); and (C) round grain of one class (American pearl). Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives requirements for material and workmanship, details, methods of inspection and test (chemical analyses shall be made in accordance with the methods of the Assn. of Official Agricultural Chemists), packaging, labeling, packing and marking.

References.—Methods of analysis, food regulations, *see* 100; rice feeding stuffs, *see* 119.5.

106. RYE AND RYE PREPARATIONS

106.1 RYE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Rye. Covers definition, uses, production, grading, sample, and marketing.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes rye. Gives requirements for five grades—No.1, No.2, No.3, No.4, and sample; and definitions and terms.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Includes rye. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of analysis, food regulations, *see* 100.

106.2 RYE FLOUR

References.—Methods of analysis, food regulations, *see* 100.

106.9 MISCELLANEOUS SPECIFICATIONS FOR RYE

References.—Rye products as mill feeds, *see* 118.9.

107. WHEAT AND PREPARATIONS FROM WHEAT

107.0 GENERAL ITEMS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Flour. Covers definition, derivation, grades, buying customs, containers, and marketing.

107.1 WHEAT

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Wheat. Covers definition, derivation, types and grades, marketing, uses, containers, and substitutes.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U.S. Revised, 1943. Includes wheat. Gives requirements for seven classes: (I) Hard red spring wheat—(A) dark northern spring, (B) northern spring, and (C) red spring; (II) durum wheat—(A) hard amber durum, (B) amber durum, and (C) durum; (III) red durum wheat; (IV) hard red winter wheat—(A) dark hard winter, (B) hard winter, and (C) yellow hard winter; (V) soft red winter wheat—(A) red winter, and (B) western red; (VI) white wheat—(A) hard white, (B) soft white, (C) white club, and (D) western white; and (VII) mixed wheat—amber mixed durum, mixed durum; six grades—No.1 heavy, No.1, No.2, No.3, No.4, No.5, and sample; and definitions and terms.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Includes wheat. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References—Methods of analysis, food regulations, *see* 107.0, 100; wheat and wheat products as feeding stuff, *see* 118.1, 118.2, 118.3; flour, *see* 107.2, 107.3, 107.4.

107.2 GLUTEN FLOUR

References.—Methods of analysis, food regulations, *see* 107.0, 107.3, 100.

107.3 WHEAT FLOUR

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Wheat Flour. Determination of moisture, ash, fat, ether extract, crude fiber, protein, hydrogen ion concentration, lipoids, and tentative methods for determination of acidity of water extract, sugars, alcohol soluble proteins, albumin and amino nitrogen, gluten, chlorine, nitrite nitrogen, gasoline color value, starch.

U.S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Wheat Flour. Covers—(1) flour, white flour, wheat flour, and plain flour; identity, label statement of optional ingredients; (2) enriched flour; identity, label statement of optional ingredients; (3) bromated flour; identity, label statement of optional ingredients; (4) enriched bromated flour; identity, label statement of optional ingredients; (5) durum flour; identity; (6) self-rising flour, self-rising white flour, self-rising wheat flour; identity, label statement of optional ingredients; (7) enriched self-rising flour; identity, label statement of optional ingredients; (8) phosphated flour, phosphated white flour, phosphated wheat flour; identity, label statement of optional ingredients.

U. S. Gov., Federal Specification N-F-481a; 1942. Flour; Wheat. Covers plain and enriched in two types—(I) hard wheat and (II) soft wheat. Gives requirements for material, workmanship, and flour; methods of inspection and tests (moisture determination and chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Gluten flour, *see* 107.2; whole wheat flour, *see* 107.4; methods of analysis, food regulations, *see* 107.0, 100; purified middlings, semolina, and farina, *see* 109.7; flour mill feeds, *see* 118.3.

107.4 WHOLE WHEAT (GRAHAM) FLOUR

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Whole Wheat Flour. Covers—(1) whole wheat flour, graham flour, entire wheat flour; identity, label statement of optional ingredients; (2) bromated whole wheat flour; identity, label statement of optional ingredients; (3) whole durum wheat flour; identity, label statement of optional ingredients.

U.S. Gov., Federal Specification N-F-461; 1931. Flour; Graham (Whole Wheat Meal). Gives requirements for material and workmanship; methods of inspection and tests (moisture determination and chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food regulations, *see* 100, 107.0, 107.3.

107.5 PASTRY FLOUR

108. BREAD AND BAKING PRODUCTS

108.0 GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Bread. Methods for determination of total solids, ash, protein, crude fiber and fat, tentative baking test.

108.1 BREAD AND ROLLS

American Bakers Assn. Proposed Bread Standards. Cover basic standards of identity for white bread, whole wheat bread, milk bread, and raisin bread.

American Bakers Assn. Recommended Pan Sizes. Covers four sizes of pans for loaves of bread weighing 12, 16, 20, and 24 oz. baked.

American Hospital Assn. 28-1. Bread and Rolls. Covers five types of bread and rolls, three styles of bread, and five styles of rolls. Based on U.S. Gov. Federal Specification EE-B-671a for Bread and Rolls, referred to below.

U. S. Gov., Federal Specification EE-B-671a; 1937. Bread and Rolls. Covers five types—(I) white, rich formula, (II) white, lean formula, (III) whole wheat, (IV) part whole wheat, and (V) rye (bread only); three styles of bread—(A) pan (round top), (B) pan (pullman or sandwich), (C) hearth baked (plain, Vienna, French); and five styles of rolls—(A) pan rusk, (B) Parkerhouse, (C) sandwich, (D) finger, and (E) hard. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for wrapping, packing, and marking.

References.—Methods of analysis, food regulations, *see* 108.0, 100; flour, *see* 107.3.

108.2 CAKES

U.S. Gov., Federal Specification N-C-71; 1937. Amendment 1; 1938. Cake-Mixtures; Prepared. Covers a powdered product prepared from wheat flour, with sugar or other fermentable carbohydrate substances, suitable shortening, salt, dried milk (whole or skimmed), domestic dried eggs (yolk and/or whites), baking-powder or other suitable leavening agent, with or without added coloring, and with spices and/or other proper flavoring agents. Gives general requirements; methods of inspection and tests; and requirements for packaging, packing, and marking.

108.3 CRACKERS

U. S. Gov., Federal Specification EE-C-651a; 1938. Crackers and Cookies. Covers three types—(I) crackers, sponge (grades A and B in plain and salted soda, grade A in plain and salted oyster, and grades A and B in graham); (II) crackers, sweet (raisin filled and fig bars); and (III) cookies (vanilla wafers and ginger snaps). Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.560; 1942. Crackers and Cookies. Covers type I—crackers, cream (milk); type II—cookies, lemon. Shall conform in every respect to the provisions of the Federal Food, Drug, and Cosmetic Act of June 25, 1938. Gives requirements for ingredients, finished crackers and cookies, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—*See* references under 108.1.

108.4 MACARONI, NOODLES, SPAGHETTI, AND VERMICELLI

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Macaroni Products. Collection and preparation of sample, total solids and moisture, ash, chlorides in ash as sodium chloride, fat, crude fiber, protein, water soluble protein-nitrogen, hydrogen-ion concentration, lipoid and lipoid phosphoric acid, unsaponifiable residue, and extraction, separation, and identification of coloring matter.

108.41 Macaroni

U. S. Gov., Federal Specification N-M-51a; 1941. Macaroni, Spaghetti, and Vermicelli. Covers six types—(I) semolina, (II) farina, (III) combination of semolina and farina, (IV) durum wheat flour, (V) hard wheat flour other than durum, and (VI) combination of hard wheat and durum flour. Gives requirements for material and workmanship; methods of inspection and tests (moisture determination and chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food regulations, *see* 108.0, 100; flour, *see* 107.3.

108.42 Noodles

U.S. Gov., Federal Specification N-N-591; 1931. Amendment 1; 1935. Noodles. Covers one grade and two types—(I) water or plain, and (II) egg. Gives requirements for material and workmanship; methods of inspection and chemical analyses (in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 108.41.

108.43 Spaghetti

U. S. Gov., Federal Specification N-M-51a; 1941. Macaroni, Spaghetti, and Vermicelli. Covers six types—(I) semolina, (II) farina, (III) combination of semolina and farina, (IV) durum wheat flour, (V) hard wheat flour other than durum, and (VI) combination of hard wheat and durum flour. Gives requirements for material and workmanship; methods of inspection and tests (moisture determination and chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 108.41.

108.44 Vermicelli

U. S. Gov., Federal Specification N-M-51a; 1941. Macaroni, Spaghetti, and Vermicelli. Covers six types—(I) semolina, (II) farina, (III) combination of semolina and farina, (IV) durum wheat flour, (V) hard wheat flour other than durum, and (VI) combination of hard wheat and durum flour. Gives requirements for material and workmanship; methods of inspection and tests (moisture determination and chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 108.41.

108.5 DIABETIC FOOD

References.—Gluten flour, *see* 107.2.

108.9 MISCELLANEOUS SPECIFICATIONS FOR BAKING PRODUCTS

U. S. Gov., Federal Specification N-B-371; 1937. Biscuit and Short-Bread Mixtures; Prepared. Covers a powdered product prepared from wheat flour with suitable shortening, dried milk (whole or skimmed), sugar or other fermentable carbohydrate substance, salt, and baking powder or other suitable leavening agent. Gives general requirements; method of inspection and test; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification N-P-361; 1937. Pie-Dough Mixture; Prepared. Gives requirements for material, workmanship, etc.; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification EE-B-351; 1931. Amendment 2; 1935. Biscuit (Hard Bread); or Biscuit, Canned. Covers one grade. Gives general and detail requirements; method of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.— Methods of analysis, food regulations, *see* 108.0, 100; flour, *see* 107.3.

109. MISCELLANEOUS GRAIN PREPARATIONS

109.1 GRITS

References.—Hominy grits, *see* 109.2; corn chops and grits for feed, *see* 119.2.

109.2 HOMINY

U. S. Gov., Federal Specification N-H-521; 1931. Amendment 3; 1941. Hominy Grits. Covers one grade and two types—(A) fine and (B) coarse. Gives requirements for material, workmanship, etc.; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov. Federal Specification N-H-541; 1931. Hominy; Lye, Canned. Covers one grade—fancy. Gives requirements for material, workmanship, etc.; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.— Hominy as stock feed, *see* 117.2; methods of analysis, food regulations, *see* 100; corn, *see* 103.1.

109.3 CORN FLAKES, CORN BREAKFAST FOODS

U. S. Gov., Federal Specification N-C-196; 1939. Amendment 2; 1940. Cereals, Breakfast; Prepared (Ready-to-Eat). Includes corn flakes. Gives requirements for corn kernels used and for the completed product; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

References.— Methods of analysis, food regulations, *see* 100.

109.4 OATMEAL AND ROLLED OATS

U. S. Gov., Federal Specification N-O-41a; 1940. Amendment 1; 1941. Oats; Rolled or Flaked. Covers two types—(I) regular and (II) quick. Gives requirements for material, workmanship, etc.; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.— Methods of analysis, food regulations, *see* 100; oats, *see* 104.1.

109.5 PUFFED RICE

U. S. Gov., Federal Specification N-C-196; 1939. Amendment 2; 1940. Cereals, Breakfast; Prepared (Ready-to-Eat). Includes puffed rice (gun-puffed), crisp rice (oven-puffed), and rice flakes. Gives requirements for rice grains used and for the completed products; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

References.—Methods of analysis, food regulations, *see* 100.

109.6 WHEAT BREAKFAST FOOD

American Hospital Assn., 28-10. Uncooked Wheat cereal. Covers four types and one grade. Based on U.S. Gov. Federal Specification N-W-261 for Uncooked Wheat Cereal, referred to below.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Wheat. Covers—(1) crushed wheat, coarse ground wheat; identity; (2) cracked wheat; identity.

U.S. Gov., Federal Specification N-C-196; 1939. Amendment 2; 1940. Cereals, Breakfast; Prepared (Ready-to-Eat). Includes shredded wheat biscuits, wheat flakes, wheat-products flakes (25 to 40 percent bran), puffed wheat (gun-puffed), wheat bran (prepared), and malted-cereal granules. Gives requirements for wheat used and for completed product; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification N-W-261a; 1942. Amendment 2; 1944. Wheat Cereal; Uncooked. Covers four types—(I) farina, (II) farina with bran and germ, (III) whole wheat meal, and (IV) whole wheat cereal, rolled or flaked. Gives general requirements for material and workmanship, detail requirements for each type; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists), and requirements for packaging, packing, and marking for shipment.

References.—Farina, *see* 109.7; method of analyses, food regulations, *see* 100.

109.7 FARINA

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Farina. Covers—(1) farina; identity, and (2) enriched farina; identity, label statement of optional ingredients.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Semolina. Covers identity.

U. S. Gov., Federal Specification N-W-621a; 1942. Amendment 2; 1944. Wheat Cereal; Uncooked. Covers four types—(I) farina, (II) farina with bran and germ, (III) whole wheat meal, and (IV) whole wheat cereal, rolled or flaked. Gives general requirements for material and workmanship, detail requirements for each type; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking for shipment.

References.—Methods of analysis, food regulations, *see* 100., 107.3; wheat middlings for animal feed, *see* 118.3.

109.9 MISCELLANEOUS SPECIFICATIONS FOR GRAIN PREPARATIONS

American Hospital Assn., 28-4. Prepared (Ready-to-Eat) Breakfast Cereals. Covers six varieties of wheat products, one variety of corn products, and three varieties of rice products. Based on U. S. Gov. Federal Specification N-C-196, and Amendment 2, for Prepared (Ready-To-Eat) Breakfast Cereals, referred to above.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Tapioca (Manioc, Mandioca, Cassava, Yuca). Covers definition, derivation, characteristics, uses, grades, containers, and substitutes.

U. S. Gov., Federal Specification N-D-591a; 1939. Doughnut, Pancake, and Waffle Mixtures; Prepared. Gives general and detail requirements for materials, workmanship, and mixtures; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification N-T-101a; 1938. Tapioca. Covers two types—(I) pearl (medium and small) and (II) granulated (medium and fine). Gives requirements for material and workmanship, and sizes; methods of sampling, inspection, and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking for shipment.

References.—Methods of analysis, food regulations, *see* 100.

110-119 FODDERS AND FEEDS

110. GENERAL ITEMS

American Society of Agricultural Engineers. Adopted by the American Society of Animal Production. A Method for Determining and Expressing the Modulus of Fineness and Uniformity of Ground Feed. (ASAE Recommended Practice.) Uniformity is expressed as a ratio of three figures which indicate the proportionate amounts of coarse, medium, and fine particles in ground feed. The sum of these three figures must always equal ten (10), and may vary from a 10:0:0 to a 0:0:10 ratio, which provides sixty-six different combinations for expressing the proportion of coarse, medium, and fine materials.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Grain and Stock Feeds. Oat Hulls in Oats and Oat Feeds. Tentative methods for determination.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Plants. Methods for determination of sand and silica, calcium, magnesium, manganese, sodium and potassium, copper, zinc, sulphur, phosphorus, chlorine, total nitrogen, and tentative methods for moisture, ash, iron, aluminum, arsenic, sugars, sucrose, starch, ether extract, and crude fiber.

111. HAY

111.0 GENERAL ITEMS

U. S. Gov. Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for nine major groups of hay—(I) alfalfa and alfalfa mixed; (II) timothy and clover; (III) prairie; (IV) Johnson and Johnson mixed; (V) grain, wild oat, vetch, and grain mixed; (VI) lespedeza and lespedeza mixed; (VII) soybean and soybean mixed; (VIII) grass; and (IX) mixed. Gives requirements for classes and grades, definitions of groups, important features of official hay standards, and definitions.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Covers eleven types—(I) alfalfa and alfalfa mixed; (II) timothy and clover; (III) prairie; (IV) Johnson and Johnson mixed; (V) grain, wild oat, veach and grain mixed; (VI) lespedeza and lespedeza mixed; (VII) soybean and soybean mixed; (VIII) cowpea and cowpea mixed; (IX) peanut and peanut mixed; (X) grass; and (XI) mixed. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

111.1 ALFALFA HAY

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Alfalfa Hay. Contains requirements for six grades of hay, as to color, permissible other grasses, foreign matter, and baling.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for alfalfa and alfalfa mixed hay. Covers ten classes—alfalfa, alfalfa light grass mixed, alfalfa heavy grass mixed, alfalfa light timothy mixed, alfalfa heavy timothy mixed, alfalfa clover mixed, alfalfa light Johnson mixed, alfalfa heavy Johnson mixed, alfalfa light grain mixed, and alfalfa heavy grain mixed; four U. S. grades—No.1, No.2, No.3, and sample; four U. S. grades for extra leafy hay; three U. S. grades for leafy hay; four U. S. grades for extra green hay; three U. S. grades for green hay; and four U. S. grades for coarse hay.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes alfalfa hay and alfalfa mixed hay. Shall conform to the provisions of the Feferal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

References.—Alfalfa meal, *see* 112.6; alfalfa mixed hays, *see* 111.5.

111.2 CEREAL HAY

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Cereal Hay. Requirements for three grades of wheat, oats, or mixture of the two, with permissible quantity of rye, color, and baling.

References.—Wild oat hay, *see* 111.99; cereal mixed hays, *see* 111.5.

111.3 BERMUDA HAY

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Bermuda Hay. Requirements for three grades as to color, mixture of other native grasses, and baling.

111.4 CLOVER HAY

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Clover Hay. Contains requirements for two grades of hay, with permissible timothy and other grasses, baled.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for timothy and clover hay. Covers eight classes—timothy, timothy light clover mixed, timothy medium clover mixed, timothy light grass mixed, timothy heavy grass mixed, timothy light alfalfa mixed, clover, and clover light timothy mixed; four U. S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra green hay; three U. S. grades for green hay; and four U. S. grades for stemmy hay.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes timothy and clover hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

References.—Clover mixed hay, *see* 111.5.

111.5 MIXED HAY

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Alfalfa and Johnson Mixed Hay. Gives requirements for three grades, with proportion of each grass, baled.

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Alfalfa, Timothy, and Grass-Mixed Hay. Requirements for five grades, with percentages of constituents for each grade, color, amount of fox tail, baled.

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Cereal or Grain and Vetch Hay. Requirements for three grades with proportions of vetch in each, color and condition, baled.

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Clover Mixed Hay. Requirements for six grades of clover mixed with timothy, and other grasses, amounts of constituents for each grade, baled.

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Mixed Peavine or Soybean Hay. Gives requirements for three grades with permissible amounts of sorghum or crab grass, baled.

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Mixed Timothy and Wild Hay. Requirements for two grades with amount of timothy in each grade, baled.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for lespedeza and lespedeza mixed hay. Covers five classes—lespedeza, lespedeza light grass mixed, lespedeza heavy grass mixed, lespedeza light Johnson mixed, and lespedeza heavy Johnson mixed; and four U. S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra leafy hay; three U. S. grades for leafy hay; four U. S. grades for extra green hay; and three U. S. grades for green hay.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for mixed hay. Covers definitions of class, grade requirements, and grade designations.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for soybean and soybean mixed hay. Covers five classes—soybean, soybean light grass mixed, soybean heavy grass mixed, soybean light Johnson mixed, and soybean heavy Johnson mixed; and four U. S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra green hay; three U. S. grades for green hay; three U. S. grades for leafy hay; and four U. S. grades for coarse hay.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for grain, wild oat, vetch, and grain mixed hay. Covers five classes of mixed hay—red oat and wild oat mixed, wheat and wild oat mixed; wild oat and grain mixed; oat light alfalfa mixed, wheat light alfalfa mixed, barley light alfalfa mixed; oat light vetch mixed, wheat light vetch mixed; oat and vetch mixed, wheat and vetch mixed, and vetch; and four U. S. grades—No. 1, No. 2, No. 3, and sample; and grades for coarse hay.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for timothy and clover hay. Covers eight classes—timothy, timothy light clover mixed, timothy medium clover mixed, timothy light grass mixed, timothy heavy grass mixed, timothy light alfalfa mixed, clover, and clover light timothy mixed; four U. S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra green hay; three U. S. grades for green hay; and four U. S. grades for stemmy hay.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for Johnson and Johnson mixed hay. Covers five classes—Johnson, Johnson light grass mixed, Johnson heavy grass mixed, Johnson light alfalfa mixed, and Johnson light lespedeza mixed; four U.S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra green hay; three U. S. grades for green hay; four U. S. grades for fine hay; and four U. S. grades for coarse hay.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for alfalfa and alfalfa mixed hay. Covers ten classes—alfalfa, alfalfa light grass mixed, alfalfa heavy grass mixed, alfalfa light timothy mixed, alfalfa heavy timothy mixed, alfalfa clover mixed, alfalfa light Johnson mixed, alfalfa heavy Johnson mixed, alfalfa light grain mixed, and alfalfa heavy grain mixed; four U. S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra leafy hay; three U. S. grades for leafy hay; four U. S. grades for extra green hay; three U. S. grades for green hay; and four U. S. grades for coarse hay.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes grain, wild oat, vetch, and grain mixed hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes mixed hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

111.6 TIMOTHY HAY

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Timothy Hay. Gives definitions of three grades of baled hay, with permissible amounts of other grasses and foreign matter.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for timothy and clover hay. Covers eight classes—timothy, timothy light clover mixed, timothy medium clover mixed, timothy light grass mixed, timothy heavy grass mixed, timothy light alfalfa mixed, clover, and clover light timothy mixed; four U. S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra green hay; three U. S. grades for green hay; and four U. S. grades for stemmy hay.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes timothy and clover hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

References.—Timothy mixed hay, *see* 111.5.

111.7 SILAGE

National Assn. of Silo Manufacturers. Grass Silage, 1940. Describes suitable grasses, legumes and cereals to be used, cutting time, quantities to be cut, windrowing, loading equipment, preservative required, filling the silo, and feeding.

111.9 MISCELLANEOUS SPECIFICATIONS FOR HAY

111.91 Johnson Hay

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Johnson Hay. Requirements for three grades with amount of clover or other native grasses, color, condition, baled.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for Johnson and Johnson mixed hay. Covers five classes—Johnson, Johnson light grass mixed, Johnson heavy grass mixed, Johnson light alfalfa mixed, and Johnson light lespedeza mixed; four U.S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra green hay; three U. S. grades for green hay; four U. S. grades for fine hay; and four U. S. grades for coarse hay.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes Johnson and Johnson mixed hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

References.—Johnson mixed hay, *see* 111.5.

111.92 Lespedeza Hay

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Lespedeza Hay. Requirements for two grades with amount of native grass in each, baled.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for lespedeza and lespedeza mixed hay. Covers five classes—lespedeza, lespedeza light grass mixed, lespedeza heavy grass mixed, lespedeza light Johnson mixed, and lespedeza heavy Johnson mixed; and four U. S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra leafy hay; three U. S. grades for leafy hay; four U. S. grades for extra green hay; and three U. S. grades for green hay.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes lespedeza and lespedeza mixed hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

References.—Lespedeza hay, *see* 119.9.

111.93 Prairie Hay

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Prairie Hay. Requirements for six grades with amount of upland, midland, and permissible weeds, color and condition.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for prairie hay. Covers three classes—upland, midland, and upland-midland mixed; four U.S. grades—No. 1, No. 2, No. 3, and sample; four U. S. grades for extra green hay; and three U. S. grades for green hay.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes prairie hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

111.94 Peanut Hay

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Peanut Hay. Requirements for three grades, including permissible amount of native grasses, foreign matter and dust, baled.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes peanut and peanut mixed hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

111.95 Peavine

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Peavine or Soybean Hay. Requirements for five grades, either cowpeas or soybeans, color, condition, baled.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U.S. Standards for Cowpea and Cowpea Mixed Hay, 1940. (For research and educational purposes only). Gives definitions, class requirements (cowpea hay, cowpea light grass mixed, cowpea heavy grass mixed, cowpea light Johnson mixed, and cowpea heavy Johnson mixed), U. S. grades (No.1, No.2, No.3, and sample grade), and special grades.

U. S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes soybean and soybean mixed hay, and cowpea and cowpea mixed hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

111.96 Salt or Alkali Hay

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Salt or Alkali Hay. Requirements for four grades of baled hay, color, condition, and weeds.

111.97 Sudan Hay

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Sudan Hay. Same as Johnson hay.

111.98 Midland Hay

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Midland Hay. Requirements for two grades, as to color and condition, with allowable amount of weeds.

111.99 Specifications for Hay Not Elsewhere Classified

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Packing Hay. Defined as wild prairie hay not good enough for other grades and not caked.

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Sample Hay. Defined as sound, baled, mixed grassy, threshed, or hay not covered by other grades.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for grain, wild oat, vetch, and grain mixed hay. Covers eleven U. S. classes—oat; red oat; wheat; barley; wild oat; red oat and wild oat mixed, wheat and wild oat mixed; wild oat grain mixed; oat light alfalfa mixed, wheat light alfalfa mixed, barley light alfalfa mixed; oat light vetch mixed, wheat light vetch mixed; oat and vetch mixed, wheat and vetch mixed; and vetch; and four U. S. grades—No.1, No.2, No.3, and sample; and grades for coarse hay.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for grass hay. Covers four U. S. grades—No.1, No.2, No.3, and sample; four U. S. grades for extra green hay; and three U.S. grades for green hay.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes definitions and class and grade requirements for soybean and soybean mixed hay. Covers five classes—soybean, soybean light grass mixed, soybean heavy grass mixed, soybean light Johnson mixed, and soybean heavy Johnson mixed; and four U.S. grades—No.1, No.2, No.3, and sample; four U. S. grades for extra green hay; three U. S. grades for green hay; three U. S. grades for leafy hay; and four U. S. grades for coarse hay.

U.S. Gov., Federal Specification N-H-121a; 1945. Hay; Feeding. Includes grass hay. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification N-H-131a; 1945. Hay and Straw; (for) Bedding. Includes sixteen classes of bedding hay—timothy, timothy light grass mixed, timothy heavy grass mixed, upland prairie, midland prairie, upland-midland prairie mixed, Johnson, Johnson light grass mixed, Johnson heavy grass mixed, wheat, oat, red oat, wild oat, red oat and wild oat mixed, wheat and wild oat mixed, and grass. Grades to conform to Official Standards of the U. S. as promulgated by the War Food Administration, U. S. Dept. of Agriculture. Gives methods of inspection (chemical analyses, if required, shall be in accordance with methods of Official Agricultural Chemists), and packaging, packing, and marking for shipment.

112. OIL SEED CAKES AND OIL CAKE MEAL

112.0 GENERAL ITEMS

112.1 FLAXSEED (LINSEED) OIL CAKE AND MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Linseed and Flax Products. Defines ground flaxseed or flaxseed meal, protein linseed oil cake or chips, protein linseed oil meal, protein linseed cubes or pellets, flaxseed screenings oil feed, protein linseed feed, and flax plant byproduct.

U.S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for flaxseed meal and linseed cake or meal to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of

Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—General definitions, *see* 112.0; methods of analysis for cottonseed oil cake, *see* 112.3; methods of analysis of feeding stuffs, *see* 117.0; linseed oil, *see* 143.1, 813.5, 848.1.

112.2 PEANUT OIL CAKE AND MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Peanut Products. Defines protein peanut oil cake and meal and unhulled peanut oil feed.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality. Article 11. Peanut Cake. Rules 89 and 90. Covers peanut cake and peanut cake prime quality.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality. Article 15. Peanut Meal. Rules 115 and 116. Covers peanut meal and peanut meal prime quality.

Southeastern Peanut Assn. Bulletin D. Official Rules, 1944. Peanut Cake. A product of peanut only, composed principally of the kernel, with such portion of the hull, or fiber, and oil, as may be left in the ordinary course of manufacture. Gives requirements for prime quality peanut cake and recommended contents of crude fat and crude fiber.

Southeastern Peanut Assn. Bulletin D. Official Rules, 1944. Peanut Meal. A product of the peanut only, being ground peanut cake, and shall correspond to peanut cake as to its classification and requirements. Gives requirements for prime quality peanut meal and recommended contents of crude fat and crude fiber.

U. S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for peanut oil meal to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection, and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—General definitions, *see* 112.0; methods of analysis of cottonseed oil cake, *see* 112.3; methods of analysis of feedingstuffs, *see* 117.0; peanuts, peanut oil, *see* 135.5, 142.6.

112.3 COTTONSEED OIL CAKE AND MEAL

American Oil Chemists' Society. Methods of Analysis, Cottonseed Cake, Meal and Meats, 1942. Covers preparation of sample, moisture, oil, and fat; nitrogen, ammonia and protein; table for the conversion of nitrogen into ammonia and protein; and color of cottonseed cake and cottonseed meal.

American Oil Chemists' Society. Methods of Sampling Slab Cake, Meal, and Cracked Cake, 1940. Includes methods of sampling cottonseed slab cake, meal, and cracked cake.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Cottonseed Products. Defines cottonseed meal, two grades of protein cottonseed meal, protein cottonseed feed, two grades of whole pressed cottonseed, cottonseed cake, six grades of protein cottonseed cake, protein cottonseed cake and meal, and Munsell color standard for cottonseed cake and meal.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality. Article 10. Cottonseed Cake. Rules 85 to 87. Covers cottonseed cake, cottonseed cake prime quality, and cottonseed cake off quality.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality. Article 12. Sized Cottonseed Cake. Rules 91 to 95. Covers nut-size cake, sheep-size cake, pea-size cake, pebble-size cake, and cottonseed cake screenings.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality. Article 13. Cottonseed Meal. Rules 100 to 103. Covers cottonseed meal, cottonseed meal prime quality, type of label for 36 percent cottonseed meal prime quality, type of label for 41 percent cottonseed meal prime quality, type of label for 43 percent cottonseed meal prime quality, Munsell color standards for prime cottonseed cake and meal, and cottonseed meal off quality.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality. Article 14. Whole Pressed Cottonseed. Rules 106 to 109. Covers whole pressed cottonseed, whole pressed cottonseed prime quality, and ground whole pressed cottonseed prime quality.

National Cottonseed Products Assn. Rules, 1945. Sampling and Methods of Chemical Analysis. Cake, Meal, and Meats. Rules 244, 245, and 273. Covers methods of sampling, preparation of sample, moisture, oil, fat, nitrogen, ammonia, protein, color of cottonseed cake and cottonseed meal, and odor of cottonseed cake and meal.

U.S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes cottonseed meal to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection, and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—General definitions, *see* 112.0; cottonseed, cottonseed oil, *see* 141, 142.4, and 813.3; methods of analysis of feedingstuffs, *see* 117.0.

112.4 COCOANUT OIL CAKE AND MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Definitions for protein cocoanut oil meal or protein copra oil meal.

References.—General definitions, *see* 112.0; methods of analysis of cottonseed oil cake, *see* 112.3; methods of analysis of feeding stuffs, *see* 117.0; cocoanut oil, *see* 142.1.

112.5 ALFALFA MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Alfalfa Products. Defines chopped alfalfa or cut alfalfa, alfalfa meal, alfalfa leaf meal, and alfalfa stem meal.

U.S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for alfalfa meal and alfalfa leaf meal to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection, and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—Alfalfa hay, *see* 111.1.

112.6 SOYBEAN OIL CAKE AND MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Soybean Products. Defines ground soybeans, protein soybean oil cake or chips, and protein soybean oil meal.

National Soybean Processors Assn. Year Book and Trading Rules, 1944-45. Soybean Oil Meal, Official Methods of Analysis. Testing methods as adopted by the Assn. of Official Agricultural Chemists shall be used as the official methods of analysis, except as otherwise specified. Covers moisture, protein, oil, crude fiber, reagents, apparatus, and determination.

U. S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for soybean oil meal to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

112.9 MISCELLANEOUS SPECIFICATIONS FOR OIL MEAL AND OIL CAKE

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Corn Products. Defines corn oil cake and corn oil meal.

References.—General definitions, *see* 112.0; methods of analysis of cottonseed oil cake, *see* 112.3; methods of analysis of feedingstuffs, *see* 117.0; corn meal, *see* 103.4.

113. STRAW

113.1 RYE STRAW

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Rye Straw. Includes two grades of straight rye straw, and two grades of tangled rye straw, color, condition, and baled requirements.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes rye straw. Gives definitions and requirements for chaff, foreign material, color, percentage of chaff and foreign material; grades—U. S. No.1, U. S. No.2, and sample; and special grades including straight rye, long rye, and chaffy.

113.2 OAT STRAW

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Oat Straw. Definitions of two grades, the better grade baled.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes oat straw. Gives definitions and requirements for chaff, foreign material, color, percentage of chaff and foreign material; and grades—U. S. No.1, U. S. No.2, sample, and chaffy.

113.3 WHEAT STRAW

National Hay Assn., Inc. Grades of Hay and Straw, 1922. Wheat Straw. Definitions of two grades, the better grade baled.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes wheat straw. Gives definitions and requirements for chaff, foreign material, color, percentage of chaff and foreign material; and grades—U. S. No.1, U. S. No.2, sample, and chaffy.

113.4 RICE STRAW

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes rice straw. Gives definitions and requirements for chaff, foreign material, color, percentage of chaff and foreign material; and grades—U. S. No.1, U. S. No.2, sample, and chaffy.

113.5 BARLEY STRAW

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Hay Standards, including Straw Standards, 1936. Repromulgated, 1940. Includes barley straw. Gives definitions and requirements for chaff, foreign material, color, percentage of chaff and foreign material; and grades—U. S. No.1, U. S. No.2, sample, and chaffy.

113.9 MISCELLANEOUS STRAW

U. S. Gov., Federal Specification N-H-131a; 1945. Hay and Straw; (for) Bedding. Includes five types of bedding straw—wheat, oat, barley, rye, and rice. Grades to conform to Official Standards of the U. S. as promulgated by the War Food Administration, U. S. Dept. of Agriculture. Gives methods of inspection (chemical analyses, if required, in accordance with methods of Assn. of Official Agricultural Chemists) and requirements for packaging, packing, and marking for shipment.

117. FODDERS AND POULTRY FEEDS

117.0 GENERAL ITEMS

117.1 COTTONSEED FEED

References.—Cottonseed, *see* 141; cottonseed oil cake and meal, *see* 112.3.

117.2 HOMINY FEED

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Corn Products. Defines hominy feed.

U.S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for hominy feed to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—Hominy, food for humans, *see* 109.2; methods of analysis, *see* 117.0.

117.3 RICE FEED

References.—Rice, *see* 105.1; rice as a feedingstuff, *see* 119.5; methods of analysis, *see* 117.0.

117.4 WHEAT FEED

References.—Wheat, *see* 107.1; wheat as a feedingstuff, *see* 118.1.

117.9 MISCELLANEOUS FEED

U. S. Gov., U. S. Army, Signal Corps. Specification 24-17B; 1942. Feed; Pigeon.

118. MILL FEEDS

118.1 WHEAT FEED

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Wheat Products. Defines wheat bran, standard middlings, flour middlings, red dog, low-grade feed flour, bran and standard middlings, hard wheat mixed feed, brown shorts, gray shorts, white shorts, and mixed feed.

U. S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for wheat white shorts, wheat flour middlings, wheat (red dog), and wheat mixed feed to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—Wheat, *see* 107.1; methods of analyses, *see* 117.0, 100.

118.2 BRAN

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Bran. Defines bran for rice, rye, corn, and wheat.

U. S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for bran (wheat bran) and wheat bran and screenings to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—Wheat, *see* 118.1, 107.1; methods of analysis, *see* 117.0, 100.

118.3 MIDDLINGS

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Middlings. Defines rye, wheat, oat middlings, and flour middlings.

U. S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for standard middlings to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—Wheat, *see* 118.1, 107.1; methods of analysis, *see* 117.0, 100.

118.9 MISCELLANEOUS SPECIFICATIONS FOR MILL FEEDS

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Buckwheat Products. Defines buckwheat shorts and buckwheat middlings.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Oat Products. Defines oat hulls, oat middlings, oat shorts, oat chop, ground oats, pulverized oats, crushed or crimped oats, oat groats, hulled oats or undried oat groats, feeding oat meal, cut oat groats, cracked oat groats, ground oat groats, clipped oat byproduct, and oat mill feed.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Rye Products. Defines rye bran, rye feed, rye red dog, rye low-grade feed flour, rye middlings, and rye flour middlings.

U.S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for brown shorts and gray shorts to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—Rye, oats, buckwheat, wheat, *see* 106.1, 104.1, 102.1, 107.1; methods of analysis, *see* 117.0, 100.

119. MISCELLANEOUS FODDERS AND FEEDS

119.1 BEET PULP FEED

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Definition for dried beet pulp.

U.S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for beet pulp (dried) to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

119.2 CORN CHOPS AND GRITS

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Corn Products. Defines corn chop, ground corn, cracked corn; screened corn chop, screened ground corn, or screened cracked corn; corn grits or hominy grits; ear corn chops and corn screenings.

References.—Corn meal, corn feed meal, *see* 103.4; methods of analysis, *see* 117.0, 100.

119.3 MEAT MEAL, MEAT SCRAPS, BONE MEAL, BLOOD MEAL

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Animal Products. Defines blood meal, blood flour, meat, meat byproducts, meat meal, meat scraps, digester tankage, meat and bone meal digester tankage, whale meal, animal liver meal, raw bone meal, steamed bone meal, special steamed bone meal, bone charcoal or bone black, and spent bone meal.

References.—Methods of analysis, *see* 117.0.

119.4 BREWERS' AND DISTILLERS' DRIED GRAINS

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Brewers' and Distillers' Products. Defines brewers' dried grains, malt sprouts, percent protein malt cleanings, malt hulls, corn distillers' dried grains, rye distillers' dried grains, distillers' corn and rye solubles, molasses distillers' solubles, yeast dried grains, or vinegar dried grains.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Malt-Tentative methods (same as official methods for analysis of malt except editing for style, adopted by the American Society of Brewing Chemists, 1935); prepared corn or rice products (flaked corn or flaked rice)—tentative methods for determination of moisture, fat, and extract; corn grits, corn meal, brewer's rice—tentative methods for determination of moisture, fat, and extract; and refined grits and refined flakes.

U. S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for distillers grain (dried) to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

U. S. Gov., Federal Specification N-M-96; 1939. Malt-Preparations. Covers one grade and two types: (I) Dry powdered malted cereal sirup—(a) nondiastatic, (b) low diastatic, and (c) medium diastatic; and (II) malted cereal sirup—(a) nondiastatic, (b) low diastatic, and (c) medium diastatic. Gives requirements for material, workmanship, minimum percent reducing sugar as maltose hydrate before inversion, maximum dextrose (glucose), percent dextrose in terms of maltose, nitrogen minimum percent, and color; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, *see* 117.0.

119.5 RICE FEED

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Rice Products. Defines rice bran, rice hulls, rice polishings, rice meal, ground rough rice, rice stone bran, and rice huller bran.

References.—Methods of analysis, *see* 117.0, 100; rice, *see* 105.1.

119.6 DIGESTER TANKAGE

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Digester Tankage. Defines digester tankage, meat meal tankage, or feeding tankage, with and without bone.

119.9 MISCELLANEOUS SPECIFICATIONS FOR FODDER AND FEED

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Barley Products. Defines barley hulls, barley feed, barley mixed feed, ground barley, and mixed feed barley.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Lespedeza Products. Defines lespedeza meal, lespedeza stem meal, and lespedeza straw meal.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Mineral Feeds. Defines mineral feed; preparations for the cure, mitigation, or prevention of disease such as drugs, medicines, or specifics; and iodized salt.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Miscellaneous Products. Defines dried apple pomace, dried apple pectin pulp, dried beet pulp, buckwheat shorts or middlings, chop, dried citrus pulp, protein cocoanut oil meal or copra oil meal, processed garbage, ivory nut meal, palm kernel oil meal, head chops, head stems, sweet-potato pulp, dried tomato pomace, velvet bean meal, and ground velvet bean and pod; also gives recognized English name and synonym of about twenty-four additional officially recognized ingredients.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Screenings. Defines screenings, grain screenings, screenings waste or refuse, and scourings.

Southeastern Peanut Assn. Bulletin D. Official Rules, 1944. Peanut Hulls. Gives detailed requirements for peanut hulls and ground peanut hulls or peanut hull bran.

U. S. Gov., Federal Specification N-F-211b; 1944. Feedstuff; Concentrated. Includes requirements for citrus pulp (dried) to conform to the provisions of the Federal Food, Drug, and Cosmetic Act; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Agricultural Chemists); and requirements for packaging, labeling, packing, and marking.

References.—Methods of analysis of feedingstuffs, *see* 117.0; methods of analysis of milk products, *see* 021.0; barley, *see* 101.0.

120-129 VEGETABLES

120. GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Metals in Foods. Preparation of reagents, design of apparatus, method for determination of arsenic, tentative method for determination of tin, copper, zinc, lead, fluorine, manganese.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Plants. Methods for determination of sand and silica, calcium, sulphur, phosphorus, chlorine, total nitrogen, and tentative methods for moisture, ash, iron, aluminum, arsenic, sugars, sucrose, starch, ether extract, and crude fiber.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Vegetables and Vegetable Products. Preparation of sample, determination of moisture, ash, sodium chloride, total acids, volatile acids, preservatives, and tentative methods for determination of sugars, coloring matters, and metals for canned vegetables in general.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Vegetables and Vegetable Products. Tentative methods for physical examination and preparation of sample (for canned products only), total solids, ash, sodium chloride, reducing sugars before inversion and after inversion, sucrose, total acids, volatile acids, preservatives and artificial sweeteners, coloring matters, and metals.

References.—Coal-tar food colors, *see* 803.10, 803.13; preservatives and artificial sweeteners, *see* 892.

121. FOLIAGE TYPE VEGETABLES, FRESH

121.1 CABBAGES AND CAULIFLOWER

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Cabbage, 1939. Covers three grades—U.S. No.1, U.S. commercial, and unclassified. Gives requirements for each grade, tolerances, sizes, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Cabbage for Sauerkraut Manufacture, 1933. Reissued, Aug. 1939. Covers three grades—U. S. No.1, U. S. No.2, and culls. Gives requirements for each grade and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Cauliflower, 1939. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade, tolerances, minimum size, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U.S. Standards for Grades of Frozen Cauliflower, 1943. Covers three grades—U. S. grade A, U. S. grade B, and substandard; and two styles—clusters and quarters. Gives definition, tolerance, and factors used in ascertaining the grade rating including color, uniformity of size, and absence of defects.

U. S. Gov., Federal Specification HHH-C-26a; 1941. Amendment 1; 1942. Cabbage; Fresh. Covers U. S. No.1 and commercial grades of pointed, Danish, domestic, savor, or red types. Gives requirements for grading; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HHH-C-101a; 1941. Amendment 1; 1942. Cauliflower; Fresh. Covers U. S. grade No.1. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned cabbage, *see* 125.1; inspection and grading regulations, food laws, *see* 120.

121.2 LETTUCE

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Greenhouse Leaf Lettuce; 1934. Reissued, July 1939. Covers three grades—U. S. Fancy, U. S. No.1, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Lettuce, 1934. Reissued, April 1942. Covers four grades—U. S. fancy, U. S. No.1, U. S. commercial, and U. S. No.2. Gives requirements for each grade, tolerances, standard pack, and definitions of terms.

U. S. Gov., Federal Specification HHH-L-226a; 1941. Amendment 1; 1942. Lettuce; Fresh. Covers iceberg and big Boston types, of four grades—(a) fancy, (b) No.1, (c) commercial, and (d) No.2. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Inspection and grading regulations, food laws, *see* 120.

121.3 ENDIVE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Chicory. Covers definition, derivation and characteristics, grades, containers, and substitutes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Endive or Escarole or Chicory, 1933. Reissued, Sept. 1, 1939. Covers two grades—U. S. No.1, and unclassified. Gives requirements for each grade, application of tolerances, and definitions of terms. (These grades do not apply to French endive or chicory, which is marketed for its roots.

U. S. Gov., Federal Specification HHH-E-516; 1934. Endive, Escarole, and Chicory; Fresh. Covers U. S. No.1 grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 121.2.

121.4 PARSLEY

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Parsley, 1930. Reissued, April 1940. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade and definitions of terms.

U.S. Gov., Federal Specification HHH-P-96; 1936. Parsley; Fresh. Covers the curly type, U. S. No.1 grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 121.2.

121.5 SPINACH

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Fresh Spinach for Canning, 1931. Reissued, Aug. 1939. Covers four grades—U. S. No.1, U. S. No.2, U. S. No.3, and unclassified. Gives requirements for each grade and tolerances.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Spinach, 1931. Reissued, Aug. 1939. Covers three grades—U. S. No.1, U. S. commercial, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U.S. Standards for Grades of Frozen Spinach, 1943. Covers three grades—U. S. grade A, U. S. grade B, and substandard. Gives definition, package size, net weight, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and character and texture.

U. S. Gov., Federal Specification HHH-S-616; 1934. Amendment 1; 1942. Spinach; Fresh. Covers two grades—(a) No.1 and (b) commercial. Gives detail requirements; methods of inspection and tests (chemican analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned spinach, *see* 125.5; inspection and grading regulations, food laws, *see* 120.

121.6 WATER CRESS

121.7 ARTICHOKES

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Globe Artichokes, 1926. Reissued, Aug. 1939. Covers three grades—U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade, sizes, and size variations, and definitions of terms.

U. S. Gov., Federal Specification HHH-A-696; 1934. Artichokes; Fresh. Covers U. S. No.1 grade. Gives requirements for grading; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Inspection and grading regulations, food laws, *see* 120.

121.8 KALE

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Kale, 1934. Reissued, Sept. 1939. Covers three grades—U. S. No.1, U. S. commercial, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Federal Specification HHH-K-106; 1936. Kale; Fresh. Covers U. S. No.1 grade. Gives detail requirement; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 121.7.

121.9 MISCELLANEOUS FOLIAGE TYPE VEGETABLES

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U.S. Standards for Grades of Frozen Broccoli, 1942. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. extra standard, and off-grade. Gives definition, count, tolerance, and factors used in ascertaining the grade rating including uniformity of size, absence of defects, and color.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Bunched Italian Sprouting Broccoli, 1943. Covers four grades—U. S. fancy, U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade, sizes, tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Mustard Greens, 1928. Reissued, Jan. 1940. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Romaine, 1928. Reissued, Aug. 1939. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Turnip Greens, 1928. Reissued, Aug. 1939. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Federal Specification HHH-B-691a; 1941. Amendment 1; 1942. Broccoli; Fresh. Covers three grades—(a) fancy, (b) No.1, and (c) No.2. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HHH-G-651; 1934. Greens (Mustard and Turnip); Fresh. Covers U. S. No.1 grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Inspection and grading regulations, food laws, *see* 120.

122. FRUIT TYPE VEGETABLES, FRESH

122.1 BEANS, PEAS, OKRA

122.11 Beans

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Frozen Lima Beans, 1943. Covers four grades—U. S. grade A, U. S. grade B, U. S. grade C, and substandard; and two types—thin-seeded and thick-seeded. Gives definition, tolerance, and details concerning factors used in ascertaining the grade rating including color and absence of defects.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Frozen Snap Beans, 1944. Covers four grades—U. S. grade A, U. S. grade B, U. S. grade C, and substandard; two types—round and flat; two colors—green and wax of the yellow or golden varieties; and three styles—whole. cut, and shoestring. Gives definition, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and texture and maturity.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Fresh Faba (Fava) Beans, 1931. Reissued, March 1942. Covers two grades—U.S. No.1 and unclassified. Gives requirements for grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Lima Beans, 1938. Reissued, Sept. 1939. Covers four grades, U. S. No.1, U. S. combination, U. S. No.2, and unclassified. Gives requirements for each type, tolerances, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Snap Beans, 1936. Reissued, June 1939. Covers five grades—U. S. fancy, U. S. No. 1, U. S. combination, U. S. No. 2, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Snap Beans for Canning or Freezing, 1940. Covers three grades—U. S. No. 1, U. S. No. 2, and culls and cull material. Gives requirements for each grade, definitions of terms, and size classification.

U. S. Gov., Federal Specification HHH-B-141a; 1941. Amendment 1; 1942. Beans, Lima; Fresh. Covers pod or hulled beans of the best commercial grade. Gives requirements for grades; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification, HHH-B-156a; 1941. Amendment 1; 1942. Beans; Snap (Green or Wax), Fresh. Covers three grades—(a) No. 1, (b) No. 2, and (c) combination. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Dried and canned beans, *see* 126.11; inspection and grading regulations, food laws, *see* 120.

122.12 Lentils

122.13 Peas

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U.S. Standards for Grades of Frozen Peas, 1943. Covers four grades—U. S. grade A, U. S. grade B, U. S. grade C, and substandard. Gives definition, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and tenderness and maturity.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Fresh Peas, 1942. Covers three grades—U. S. No. 1, U. S. fancy, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Federal Specification HHH-P-156a; 1945. Peas; Fresh. Covers two grades—(a) fancy and (b) No. 1. Gives requirements for varieties and details for each grade; methods of inspection and tests (chemical analyses, if required, in accordance with methods of the Assn. of Official Agricultural Chemists); packing, labeling, and marking for shipment.

References.—Canned peas, dry peas, *see* 126.13; inspection and grading regulations, food laws, *see* 120.

122.14 Okra

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Okra, 1928. Reissued, Sept. 1939. Covers two grades—U. S. No. 1 and unclassified. Gives requirements for each grade and definitions of terms.

References.—*See* references under 122.13.

122.2 GREEN CORN

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Frozen Whole-Grain Corn, 1944. Covers four grades—U. S. grade A, U. S. grade B, U.S. grade C, and substandard; and two colors—golden (yellow) and white. Gives definition, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and tenderness and maturity.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Green Corn, 1927. Reissued, Aug. 1939. Covers three grades—U. S. No. 1, U. S. fancy, and unclassified. Gives requirements for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Sweet Corn for Canning, 1935. Reissued, Apr. 1940. Covers two grades—U. S. No. 1 and U. S. No. 2; and three classes—A, B, and C. Gives development of the work, styles of canned corn, common basis of payments, method of inspection, uses made of inspection reports, and definitions of terms.

U. S. Gov., Federal Specification HHH-C-591a; 1941. Amendment 1; 1942. Corn, Green; Fresh. Covers two grades—(a) fancy and (b) No. 1, white or yellow types. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Grain corn, canned corn, *see* 103.1, 126.2; inspection and grading regulations, *see* 120.

122.3 CUCUMBERS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Cucumbers for Pickling, 1936. Reissued, Oct. 1939. Covers four grades—U.S. No. 1, U.S. No. 2, U.S. No. 3, and culls. Gives requirements for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Greenhouse Cucumbers, 1934. Reissued, Oct. 1939. Covers four grades—U. S. fancy, U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements for each grade, tolerance for defects and size, standard pack, marking for size, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Slicing Cucumbers, 1941. Reissued, May 1942. Covers five grades—U. S. fancy, U. S. No. 1, U. S. No. 2, U. S. No. 1 small, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Federal Specification HHH-C-751a; 1941. Amendment 2; 1942. Cucumbers; Slicing, Fresh. Covers three grades—(a) fancy, (b) No. 1, and (c) No. 2 (grades corresponding to the U. S. grades defined in the standards of the U. S. Dept. of Agriculture). Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Cucumber pickles, *see* 129.11; inspection and grading regulations, food laws, *see* 120.

122.4 EGGPLANT

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Eggplant, 1933. Reissued, Oct. 1939. Covers three grades—U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements for each grade, marking requirements for size, application of tolerances, and definitions of terms.

U. S. Gov., Federal Specification HHH-E-236; 1934. Eggplant; Fresh. Covers U. S. No. 1 grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Inspection and grading regulations, food laws, *see* 120.

122.5 PEPPERS

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Sweet Peppers, 1929. Reissued, Oct. 1939. Covers four grades—U. S. fancy, U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements for each grade, tolerances, red or mixed peppers, and definitions of terms.

U. S. Gov., Federal Specification HHH-P-246; 1936. Peppers; Sweet, Fresh. Covers the bell and bullnose type, U. S. No. 1 grade, long or short variety. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Regulations on inspection and grading, food laws, *see* 120; pepper spices, *see* 154.23.

122.6 PUMPKINS AND SQUASH

U. S. Gov., Federal Specification HHH-P-796; 1936. Pumpkin; Fresh. Covers the best commercial grade, "field" and "pie" types. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HHH-S-666; 1935. Squash; Fresh. Covers the best commercial grade and three types—(I) Hubbard (blue or green), (II) marrow, and (III) white (Patty Pan type). Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned pumpkin and squash, *see* 126.6; regulations on inspection and grading, food laws, *see* 120.

122.7 TOMATOES

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Canning Tomatoes, 1938. Reissued, July 1939. Covers three grades—U.S. No. 1, U.S. No. 2, and culls. Gives requirements for each grade, minimum size, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Fresh Tomatoes, 1934. Reissued, Aug. 1939. Covers three grades—U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements and tolerances for each grade, marking for size, standard packs, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Greenhouse Tomatoes, 1934. Reissued, Aug. 1939. Covers four grades—U. S. fancy, U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements and tolerances for each grade, size classification, size tolerance, standard pack, marking for size, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Tomatoes for Manufacture of Strained Tomato Products, 1933. Reissued Aug. 1939. Covers three grades—U. S. No. 1, U. S. No. 2, and culls. Gives requirements for each grade and definitions of terms.

U. S. Gov., Federal Specification HHH-T-576a; 1941. Amendment 1; 1942. Tomatoes. Covers No. 1 and No. 2 grades. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned tomatoes, catsup, *see* 126.7, 129.12; regulations on inspection and grading, food laws, *see* 120.

123. ROOT TYPE VEGETABLES, FRESH

123.1 BEETS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Beets With Short-Trimmed Tops, 1942. Covers two grades—U. S. No. 1 and unclassified. Gives requirements for each grade, tolerance, size terms, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Bunched Beets, 1927. Reissued, Aug. 1939. Covers two grades—U. S. No. 1, and unclassified. Gives requirements for each grade, size terms, bunching, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Topped Beets, 1934. Reissued, Oct. 1939. Covers two grades—U. S. No. 1 and unclassified. Gives requirements for each grade, tolerances, sizes, and definitions of terms.

U. S. Gov., Federal Specification HHH-B-166; 1934. Beets; Fresh. Covers U. S. No. 1 grade, either bunched or topped. Gives requirements for grading; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned beets, *see* 127.1; beet pulp, *see* 119.1; regulations on inspection and grading, food laws, *see* 120.

123.2 CARROTS

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Bunched Carrots, 1937. Reissued, Mar. 1942. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade, length of tops, standard bunches, tolerances, sizes, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Carrots With Short Trimmed Tops, 1942. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade, tolerances, sizes, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Topped Carrots, 1928. Reissued, Oct. 1939. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade and definitions of terms.

U. S. Gov., Federal Specification HHH-C-81; 1934. Carrots; Fresh. Covers U. S. No.1 grade. Gives detail requirements; method of inspection and tests (chemical analyses in accordance with the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned carrots, *see* 127.2; inspection and grading regulations, food laws, *see* 120.

123.3 ONIONS AND SCALLIONS

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Bermuda Onions, 1937. Reissued, Aug. 1939. Covers four grades—U.S. No.1, U.S. No.2, U.S. commercial, and unclassified. Gives requirements for each grade, tolerance, pink classification, size classification, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Creole Onions, 1943. Covers four grades—U.S. No.1, U. S. No.2, U. S. combination, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Northern Grown Onions, 1939. Covers five grades—U. S. No.1, U. S. commercial, U. S. No.1 boilers, U. S. No.1 picklers, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Onion Sets, 1940. Covers three grades—U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade and definitions of terms.

U. S. Gov., Federal Specification HHH-O-532; 1941. Amendment 1; 1942. Onions; Bermuda, Fresh. Covers the crystal wax, white Bermuda, yellow Bermuda, and pink Bermuda varieties; three grades—No.1, No.2, and commercial; and in small, medium, and large sizes. Gives requirements for size and condition; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HHH-O-534; 1941. Amendment 1; 1941. Onions; Creole, Fresh. Covers the white and red creole varieties; three grades—(a) No.1, (b) No.2, and (c) combination; and two sizes—1 3/4-in. minimum for No.1 grade and 1 1/2-in. minimum for No.2 and combination grades. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HHH-O-536; 1941. Amendment 1; 1942. Onions; Northern-Grown Type, Fresh. Covers three grades—(a) No.1, (b) commercial, and (c) No.1 boilers—of sweet Spanish, yellow globe Danvers, Balbosa, yellow onions, yellow globe, white globe, and red globe types. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HHH-O-541; 1936. Onions or Shallots; Green, Bunched. Covers the best commercial grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Inspection and grading regulations, food laws, *see* 120.

123.4 PARSNIPS AND TURNIPS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Bunched Turnips, 1927. Reissued, Aug. 1939. Covers two grades—U. S. No.1 and unclassified. Gives requirements, tolerances, size terms, bunching, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Topped Turnips or Rutabagas, 1935. Reissued, Aug. 1939. Covers two grades—U.S. No.1 and unclassified. Gives requirements for each grade, tolerances, size explanation, and definitions of terms.

U. S. Gov., Federal Specification HHH-P-103; 1936. Parsnips; Fresh. Covers the best commercial grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HHH-T-851; 1935. Turnips; Fresh. Covers U. S. No.1 grade and two types—(I) turnips, yellow or rutabaga, and (II) white turnips. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Inspection and grading regulations, food laws, *see* 120.

123.5 POTATOES

123.51 White Potatoes

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory

Announcements No. 151; 1942. U. S. Standards for Potatoes. Covers six grades—U. S. fancy, U. S. extra No.1, U. S. No.1, U. S. commercial, U. S. No.2, and unclassified. Gives requirements for each grade, tolerances for defects, size classification for all grades except U. S. fancy, and definitions of terms.

U.S. Gov., Federal Specification HHH-P-611; Amendment 2; 1942. Potatoes; Irish. Covers U. S. No.1 grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 120.

123.52 Sweetpotatoes

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Sweetpotatoes, 1937. Reissued, Aug. 1939. Covers five grades—U. S. fancy, U. S. extra No.1, U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Federal Specification HHH-P-621a; 1941. Amendment 1; 1942. Potatoes; Sweet, Fresh. Covers the dry and moist types and four grades—(a) fancy, (b) extra No.1, (c) No.1, and (d) No.2. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analyses, grading regulations, food laws, *see* 120.

123.6 RADISHES

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Bunched Radishes, 1926. Reissued, Aug. 1939. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade, bunching, size terms, and definitions of terms.

U. S. Gov., Federal Specification HHH-R-86; 1936. Radishes; Red, Fresh, Bunched. Covers U. S. No.1 grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analyses, grading regulations, food laws, *see* 120; prepared horse-radish, *see* 154.13.

123.7 SALSIFY

123.8 SHALLOTS AND GARLIC

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Bunched Shallots, 1941. Covers three grades—U. S. No.1, U. S. No.2, and unclassified. Gives requirements and tolerances for each grade, sizes (small, medium, and large), standard bunches, and definitions of terms.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Garlic, 1934. Reissued, Sept. 1939. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

References.—Methods of analysis, grading regulations, food laws, *see* 120.

124. STEM TYPE VEGETABLES, FRESH

124.1 ASPARAGUS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Frozen Asparagus, 1944. Covers three grades—U. S. grade A, U. S. grade B, and substandard; and three styles—spears or stalks, cut spears, and cuts. Gives definition, sizes, tolerance, and factors used in ascertaining the grade rating including color, uniformity of size, absence of defects, and tenderness and texture.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Asparagus (Fresh), 1941. Covers three grades—U. S. No.1, U. S. No.2, and unclassified. Gives requirements for grades, tolerances, diameter classifications (very small, small, medium, large, very large), amount of green color, stalk length, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Asparagus Plumosus, 1930. Reissued, Mar. 1940. Covers three grades—U. S. fancy, U. S. No.1, and U. S. commercial. Gives requirements for each grade, sizes (corsage, short, medium, and long), and definitions of size and grade terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Green Asparagus for Canning or Freezing, 1937. Reissued, Oct. 1939. Covers four grades—U. S. No.1, U. S. No.2, culls, and butts. Gives requirements for each grade, diameter, classifications, and definitions of terms.

U. S. Gov., Federal Specification HHH-A-731; 1934. Asparagus; Fresh. Covers U. S. No.1 grade. Gives requirements for grading; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned asparagus, *see* 128.1; methods of analysis, grading, regulations, food laws, *see* 120; asparagus sprays, *see* 259.

124.2 CELERY

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Rough Celery, 1938. Reissued, Aug. 1939. Covers five grades—U. S. fancy, U. S. No.1, U. S. combination, U.S. No.2, and unclassified. Gives requirements for each grade, tolerances, requirements as to count, and definitions of terms.

U. S. Gov., Federal Specification HHH-C-191b; 1941. Amendment 1; 1942. Celery; Fresh. Covers four grades—(a) fancy, (b) No.1, (c) combination, and (d) No.2. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural

Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 120.

124.3 MUSHROOMS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Mushrooms, 1928. Reissued, Oct. 1939. Covers two grades—U. S. No. 1 and unclassified. Gives requirements for each grade, size classification, tolerance, and definitions of terms.

References.—*See* references under 124.2.

124.4 RHUBARB

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Rhubarb (Field Grown), 1933. Reissued, Aug. 1939. Covers four grades—U. S. fancy, U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Federal Specification HHH-R-301; 1936. Rhubarb; Fresh. Covers U. S. No. 1 grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* references under 124.2.

124.5 SWEET ANISE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Sweet Anise, 1930. Reissued, Aug. 1939. Covers two grades—U. S. No. 1 and unclassified. Gives requirements for each grade and definitions of terms.

125. FOLIAGE TYPE VEGETABLES, CANNED OR PRESERVED

125.0 GENERAL ITEMS

National Canners Assn. Manual for Canned Food Labels, 1942. Definitions and Standards N. C. A. Recommended Terms. Vegetables. Covers artichokes, mustard greens, spinach, and turnip greens.

125.1 CANNED CABBAGE, SAUERKRAUT, AND CANNED SAUERKRAUT

National Kraut Packers Assn. Kraut. Utilizes Gov. standards. U. S. Gov. Dept. of Agriculture standards for grades of canned sauerkraut and standards for bulk sauerkraut.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Sauerkraut, 1933. Covers three grades—U. S. grade A (first quality), U. S. grade C (second quality), and off-grade (substandard). Gives definition, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, net drained weight, maximum head space, and factors used in ascertaining the grade rating including color, cut, absence of defects, crispness, and flavor.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Barrelled or Bulk Sauerkraut, 1935. Covers three grades—U. S. grade A (first quality), U. S. grade C (second quality), and off-grade (substandard). Gives definition, meaning of "normal flavor," and factors used in ascertaining the grade rating including color, cut, absence of defects, texture, and flavor.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S. R. A., F. D. C. 2; 1944. Definitions and Standards for Food. Canned Cabbage. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Specification JJJ-C-21; 1931. Cabbage; Canned. Covers extra standard grade. Gives detail requirements; and methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-S-71a; 1941. Sauerkraut; Canned. Covers two grades—(A) fancy and (C) standard. Gives requirements for material, workmanship, drained weights, head space, can sizes, and details for each grade; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists), and requirements for packaging, packing, and marking.

References.—Fresh cabbage, *see* 121.1; methods of analysis, grading regulations, food laws, *see* 120.

125.2 CANNED LETTUCE

125.3 CANNED ENDIVE

125.4 CANNED PARSLEY

125.5 CANNED SPINACH

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Spinach (and Other Greens), 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container and drained weights, can size, can dimensions, minimum drained weight, and factors used in ascertaining the grade rating including color, absence of defects, and tenderness and texture.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S. R. A., F. D. C. 2; 1944. Definitions and Standards for Food. Canned Spinach. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Specification JJ-S-611a; 1941. Spinach; Canned. Covers two grades; fancy and standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh spinach, *see* 121.5; method of analysis, grading regulations, food laws, *see* 120.

125.6 CANNED WATER CRESS

125.9 MISCELLANEOUS CANNED VEGETABLES OF FOLIAGE TYPE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Spinach (and Other Greens), 1941.

Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container and drained weights, can size, can dimensions, minimum drained weight, and factors used in ascertaining the grade rating including color, absence of defects, and tenderness and texture.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Artichokes. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Beet Greens. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Broccoli. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Brussels Sprouts. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Cauliflower. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Collards. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Dandelion Greens. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Kale. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Mustard Greens. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Swiss Chard. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Turnip Greens. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Specification JJJ-T-806; 1941. Turnip Greens; Canned. Covers two grades—fancy and standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh turnip greens and mustard greens, *see* 121.9; methods of analysis, grading regulations, food laws, *see* 120.

126. FRUIT TYPE VEGETABLES, CANNED OR PRESERVED

126.0 GENERAL ITEMS

National Canners Assn. Manual for Canned Food Labels, 1942. Definitions and Standards N.C.A. Recommended Terms. Vegetables. Covers beans, green and wax; beans, lima or butter; corn; peas; pumpkin; squash; and tomatoes.

126.1 BEANS AND PEAS

126.11 Canned Beans and Dry Beans

American Oil Chemists' Society. Methods of Analysis, Soybeans, 1941. Covers moisture, pre-drying, grinding, second moisture, oil, ammonia, free fatty acid, calculation of results, calculation of yields, and example of calculation of the yields.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Soybean. Covers definition, characteristics, derivation, uses, classes and grades, marketing information, containers, and substitutes.

National Cottonseed Products Assn. Rules, 1945. Methods of Chemical Analysis. Soybeans. Rule 270B. Covers original moisture, pre-drying, grinding, second moisture, oil, ammonia, free fatty acid, and calculation of results.

Northwest Canners Assn. Specifications for Canned Fruit and Vegetables. Includes variety grade, syrup, and description of packed green beans.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Handbook of Official Grain Standards of the U. S. Revised, 1943. Includes soybeans. Covers five classes—(I) yellow, (II) green, (III) brown, (IV) black, and (V) mixed. Gives requirements for five grades—No. 1, No. 2, No. 3, No. 4, and sample; and definitions and terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Dry Beans, 1934. Covers three grades—U. S. grade A (fancy), U. S. grade C (standard) and off-grade (substandard); and four styles—in tomato sauce, in plain sauce, in tomato sauce with pork, and in plain sauce with pork. Gives definition, explanation, condition of containers, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, maximum head space, and factors used in ascertaining the grade rating including consistency, absence of defects, tenderness and texture, and flavor.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Lima Beans, 1936. Covers four grades—U. S. grade A (fancy), U. S. grade B (extra standard), U. S. grade C (standard), and off-grade (substandard). Gives definition, meaning of "normal flavor," condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, minimum drained weight, maximum head space, and factors used in ascertaining the grade rating including character of liquor, uniformity of size, absence of defects, and maturity.

U.S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Beans, Dry Edible. Revised, Sept. 1, 1941. Covers twenty-three classes—pea, medium white, marrow, great northern, small white, flat small white, large white, white kidney, light red kidney, dark red kidney, western red kidney, yellow eye beans, old fashioned yellow eye, cranberry, small red, pink, bayo, blackeye, pinto, lima, baby lima, miscellaneous, and mixed. Gives definitions and grade requirements for five U. S. grades—No.1, No.2, No.3, substandard, and sample.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Snap (or Stringless) Beans, 1933. Covers four grades—U. S. grade A (fancy), U. S. grade B (extra standard), U. S. grade C (standard) and off-grade (substandard); and two styles—cut and asparagus style. Gives definition, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, maximum head space, drained net weight, artificially colored, and factors used in ascertaining the grade rating including clearness of color, uniformity of color, uniformity of size, absence of defects, maturity, and flavor.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Beans. Covers—(1) green beans or green stringless beans or stringless green beans; identity, label statement of optional ingredients, source, optional forms of vegetable ingredients; (2) wax beans or stringless wax beans; identity, label statement of optional ingredients, source, optional forms of vegetable ingredients; (3) shelled beans; identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Bean Sprouts. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Specification N-G-651a; 1945. Grains. Includes soybeans. Shall conform to the provisions of the Federal Food, Drug, and Cosmetic Act. Gives detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification JJJ-B-91; 1930. Amendment 5; 1938. Beans; Canned (With Pork). Covers one grade and two types—(A) in tomato sauce, and (B) in plain sauce. Gives detail requirements; methods of inspection, tests, etc. (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-B-96; 1930. Amendment 3; 1938. Beans; Canned (Without Pork). Covers one grade and two types—(A) in tomato sauce and (B) in plain sauce. Gives detail requirements; methods of inspection, tests, etc. (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-B-106a; 1931. Amendment 2; 1935. Beans; Dry. Covers five types—(A) white, (B) kidney, (C) lima, (D) colored, and (E) blackeye. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-B-126b; 1941. Beans; Lima, Canned. Covers two types—(I) fresh and (II) soaked dry. Gives detail requirements; sizes of the beans, viz., tiny, small, medium, and large; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-B-151a; 1941. Beans; Snap, Canned. Covers two types—(I) round and (II) flat, green or wax; and three styles—cut, whole, and shoestring (French or Julienne). Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.— Fresh string and wax beans, *see* 122.11; methods of analysis, grading regulations, food laws, *see* 120.

126.12 Canned Lentils

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Lentils, 1942. Lentils shall be dry threshed seeds of the lentil plant. Covers four classes—large, medium, small, and mixed; for U. S. grades—No.1, No.2, substandard, and sample grade; and two special grades—high moisture lentils and off-color lentils. Gives definitions of terms.

126.13 Canned Peas and Dry Peas

Northwest Canners Assn. Specification for Canned Fruits and Vegetables. Includes variety, grade, syrup, and description of packed peas and mixed carrots and peas.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Official U. S. Standards for Dry Peas, 1937. Reissued, Oct. 1941. Gives definitions of terms; classes; four U. S. grades—No.1, No.2, No.3, and sample; color, moisture, and size requirements; special grades of large peas; special grades of small peas; and inspection and certification of thresher-run peas.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Black-Eye Peas (Canned Fresh), 1939. Covers three grades—U. S. grade A (fancy), U. S. grade C (standard), and off-grade (substandard). Gives definition, explanation of terms, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, minimum drained net weight, maximum head space, and factors used in ascertaining the grade rating including character of liquor, color, uniformity of size, absence of defects, and maturity.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Official U. S. Standards for Split-Peas, 1937. Reissued, Nov. 1939. Gives definitions of terms and requirements for two classes—green and yellow; four U. S. grades—No. 1, No. 2, No. 3, and sample; color and size requirements; and grades for split-pea chips.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Peas, 1942. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. extra standard, U. S. grade C or U. S. standard, and off-grade; and two types—early peas and sweet peas (or sugar peas). Gives fill of container requirements for canned peas, definition of sizes (seven sizes), tolerance, and factors used in ascertaining the grade rating including clearness of liquor, uniformity of color, absence of defects, and maturity.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R149-33; 1933. Sieve Sizes of Canned Peas. This recommendation establishes a simplified schedule of sieve sizes to be used in the grading of canned peas of the Alaska and sweet varieties types. Initiated by the National Canners Assn.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C. 2; 1944. Definitions and Standards for Food. Canned Black-Eye Peas, Black-Eyed Peas, and Field Peas. Covers identity, label statement of optional ingredients, and source.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Peas. Covers—(1) identity, label statement of optional ingredients, (2) quality, label statement of substandard quality, and (3) fill of container, label statement of substandard fill.

U. S. Gov., Federal Specification JJJ-P-151a; 1941. Peas; Canned. Covers two types—(I) early; that is, early maturing or other smooth-skin varieties; and (II) sweet (or sugar); those maturing later, wrinkled varieties having a natural sweet flavor. Covers seven sizes and three grades—fancy, extra standard, and standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-P- 156; 1938. Peas; Dry, Split. Covers two classes—(A) green, which are manufactured from Alaska, Bluebell, and other varieties of peas; and (B) yellow, manufactured from White Canada, First and Best, and other varieties of peas. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh peas, *see* 122.13; methods of analysis, grading regulations, food laws, *see* 120.

126.14 Canned Okra

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Okra, 1933. Covers three grades—U. S. grade A (fancy), U. S. grade C (standard), and off-grade (substandard). Gives definition, cut okra, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, maximum head space, and factors used in ascertaining grade rating including clearness of liquor, uniformity of color, uniformity of size, absence of defects, maturity, and flavor.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Okra. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

126.2 CANNED CORN AND SUCCOTASH

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Succotash, 1944. Composed of cream-style or whole-grain corn and lima beans or snap beans, with or without tomatoes. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. extra standard, U. S. grade C or U. S. standard, and off-grade. Gives proportion of ingredients, fill of container and drained weight; factors used in ascertaining the grade rating including uniformity of color, consistency (of cream-style corn), absence of defects, cut (of corn), maturity, color, and grade of each vegetable.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Corn—Cream Style, 1932. Covers four grades—U. S. grade A (fancy), U. S. grade B (extra standard or choice), U. S. grade C (standard), and off-grade (substandard). Gives definition, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, maximum head space, and factors used in ascertaining the grade rating including color, consistency, absence of defects, cut, maturity, and flavor.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Corn—Whole-Grain Style, 1932. Covers four graoes—U. S. grade A (fancy), U. S. grade B (extra standard or choice), U. S. grade C (standard), and off-grade (substandard). Gives definitions, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, minimum drained weight, maximum head space, and factors used in ascertaining the grade rating including color, absence of defects, cut, maturity, and flavor.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Corn. Covers: (1) White sweet corn or white corn; (2) white sugar corn; (3) yellow sweet corn, yellow corn, yellow sugar corn, golden corn, golden sugar corn, golden sweet corn; (4) field corn—with their identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Specification N-C-501a; 1941. Amendment 1; 1942. Corn; Sweet, Canned. Covers two types—cream style and whole grain style; two colors—white and golden (yellow); and three grades—(A) fancy, (B) extra standard, and (C) standard. Gives requirements for drained weights and head space; detail requirements for each grade; methods of inspection and test; and requirements for packaging, packing, and marking for shipment.

References.—Fresh corn, *see* 122.2; methods of analyses, grading regulations, food laws, *see* 120.

126.3 CANNED CUCUMBERS

References.—Cucumber pickles, *see* 129.11.

126.4 CANNED EGGPLANT

126.5 CANNED PEPPERS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U.S. Standards for Grades of Canned Pimientos, 1933. Covers five grades—U. S. grade A (fancy), U. S. grade A (fancy) pieces, U.S. grade C (standard), U.S. grade C (standard) pieces, and off-grade (substandard). Gives definition, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum head space, and factors used in ascertaining the grade rating including color, wholeness, firmness, uniformity of size, and absence of defects.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Green Sweet Peppers and Red Sweet Peppers. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Pimientos or Pimentos. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

126.6 CANNED PUMPKIN AND SQUASH

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U.S. Standards for Grades of Canned Pumpkin (and Squash), 1934. Covers three grades—U. S. grade A (fancy), U. S. grade C (standard), and off-grade (substandard). Gives definition, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, maximum head space, and factors used in ascertaining the grade rating including consistency, color, finish, absence of defects, and flavor.

U. S. Gov., Federal Specification JJJ-P-791a; 1943. Pumpkin; Canned. Covers two grades—(A) fancy and (B) standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-S-661; 1931. Squash; Canned. Covers two grades—(A) fancy and (B) standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 120; fresh pumpkin and squash, *see* 122.6.

126.7 CANNED TOMATOES AND TOMATO JUICE

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Vegetables and Vegetable Products. Tomato Products. Preparation of sample, determination of ash, alkalinity of ash, sodium chloride, reducing sugars, sucrose, acetic and citric acids; tentative methods for determination of solids, sand, microanalyses for molds, yeasts, spores, bacteria.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Tomatoes, 1942. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. extra standard, U. S. grade C or U. S. standard, and off-grade. Gives fill of container requirements for canned tomatoes, can size, can dimensions, tolerances, and factors used in ascertaining the grade rating including drained weight, wholeness, color, and absence of defects.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Tomato Paste, 1944. Covers three concentrations—heavy, medium, and light; two textures—fine and coarse; and three grades—U. S. grade A or U. S. fancy; U. S. grade C or U. S. Standard; and U. S. grade D or substandard. Gives fill of container, definitions, tolerances for certification of officially drawn samples, and factors used in ascertaining the grade rating including color and absence of defects.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Tomato Puree, Tomato Pulp, 1945. Covers grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and U. S. grade D or substandard; in three concentrations—heavy, medium, and light. Gives definition, recommended fill of container, explanation of terms, tolerance for certification of officially drawn samples, ascertaining the grade, and factors used in ascertaining the grade rating including color and absence of defects.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Tomato Juice (Canned or Bottled), 1938. Covers three grades—U. S. grade A (fancy), U. S. grade C (standard), and off-grade (substandard). Gives definition, condition of container, condition of package and label, fill of container, slack fill, and factors used in ascertaining the grade rating including color, consistency, absence of defects, and flavor.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Tomatoes. Covers—(1) canned tomatoes; identity, label statement of optional ingredients; (2) canned tomatoes; quality, (3) canned tomatoes; fill of container.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Tomato Juice and Yellow Tomato Juice. Covers identity.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Tomato Paste. Covers identity and label statement of optional ingredients.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Tomato Puree and Tomato Pulp. Covers identity and label statement of optional ingredients.

U. S. Gov., Federal Specification JJJ-T-571a; 1941. Tomatoes; Canned. Covers four grades—fancy, fancy whole, extra standard, and standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-T-576; 1941. Tomato Juice; Canned. Covers two grades—fancy and standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh tomatoes, catsup, *see* 122.7, 129.12; methods of analysis, grading regulations, food laws, *see* 120.

127. ROOT TYPE VEGETABLES, CANNED OR PRESERVED

127.0 GENERAL ITEMS

National Canners Assn. Manual for Canned Food Labels, 1942. Definitions and Standards N.C.A. Recommended Terms. Vegetables. Covers beets, carrots, onions, potatoes, and turnips.

127.1 CANNED BEETS

Northwest Canners Assn. Specifications for Canned Fruits and Vegetables. Includes variety, grade, syrup, and description of packed beets.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Beets, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade; and six styles—whole, sliced, quartered, diced, shoestring, and cut. Gives definition, fill of container and drained weight, can size, minimum drained weight, size designation, count range per can, and factors used in ascertaining the grade rating including color, uniformity of size, absence of defects, and texture.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Beets. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Specification JJJ-B-181a; 1941. Beets; Canned. Covers two grades—fancy and standard; and six styles—whole, sliced, quartered, diced, shoestring (French or Julienne), and cut. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh beets, *see* 123.1; methods of analysis, grading regulations, food laws, *see* 120.

127.2 CANNED CARROTS

Northwest Canners Assn. Specifications for Canned Fruits and Vegetables. Includes variety, grade, syrup, and description of packed carrots and mixed carrots and peas.

U. S. Gov., Dept. of Agriculture, War Food Administration, Food Distirbution. Tentative U. S. Standards for Grades of Canned Carrots, 1940. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade (substandard); and six styles—whole, sliced, quartered, diced, shoestring, and cut. Gives definition, explanation of terms, recommended head space and drained weights, can size, can dimensions, maximum capacity, maximum head space, minimum drained weight, and factors used in ascertaining the grade rating including color, uniformity of size, absence of defects, and tenderness and texture.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Carrots. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Specification JJJ-C-76a; 1941. Carrots; Canned. Covers six styles—whole, sliced, quartered, diced, shoestring (French or Julienne), and cut; and two grades—fancy and standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh carrots, *see* 123.2; methods of analysis, grading regulations, food laws, *see* 120.

127.3 CANNED ONIONS

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Onions. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

127.4 CANNED PARSNIPS AND TURNIPS

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Parsnips. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Rutabagas. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Turnips. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

127.5 CANNED POTATOES

127.51 Canned White Potatoes

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Potatoes. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

127.52 Canned Sweetpotatoes

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Sweetpotatoes, 1934. Covers three grades—U. S. Grade A (fancy), U. S. grade C (standard), and off-grade (substandard). Gives definition, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, minimum drained weight, maximum head space, and factors used in ascertaining the grade rating including wholeness, uniformity of color, uniformity of size, absence of defects, tenderness and texture, and flavor.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Sweetpotatoes. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Specification JJJ-P-611; 1931. Amendment 2; 1937. Potatoes; Sweet, Canned. Covers two types—(I) whole or cut and (II) solid pack (mashed); and two grades—(A) fancy and (B) standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

127.6 CANNED RADISHES

127.7 CANNED SALSIFY

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Salsify. Covers identity, label statement of optional ingredients, and source.

128. STEM TYPE VEGETABLES, CANNED OR PRESERVED

128.0 GENERAL ITEMS

National Canners Assn. Manual for Canned Food Labels, 1942. Definitions and Standards N.C.A. Recommended Terms. Vegetables. Covers asparagus and mushrooms.

128.1 CANNED ASPARAGUS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Asparagus, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade; two types—culturally bleached and all green; and five styles of—peeled or unpeeled, spears or stalks, tips, points, cut spears, and bottom cuts. Gives definitions, fill of container and drained weight, can size, can dimensions, minimum drained weight, count and size, and factors used in ascertaining the grade rating including clearness of color, color, absence of defects, and tenderness.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Asparagus. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Specification JJJ-A-711b; 1942. Asparagus; Canned. Covers two types—(I) culturally bleached and (II) all green; and two grades—fancy and standard; and five styles. Gives requirements for sizes of cans and contents; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Argicultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh asparagus, *see* 124.1; methods of analysis, grading regulations, food laws, *see* 120.

128.2 CANNED CELERY

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Celery. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

128.3 CANNED MUSHROOMS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Mushrooms, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade; and four styles—whole, button, sliced, and stems and pieces. Gives sizes, can size, capacity, minimum drained weight, explanation of terms, and factors used in ascertaining grade rating including color, uniformity of size and symmetry, absence of defects, and tenderness.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Mushrooms. Covers identity, label statement of optional ingredients, source, and optional forms of vegetable ingredients.

U. S. Gov., Federal Specification JJJ-M-851a; 1940. Mushrooms; Canned. Covers two types—(I) brown and (II) white; two styles—(a) whole or "buttons" and (b) sliced; and two grades—(A) fancy and (C) standard. Gives detail requirements; methods of sampling, inspection, and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

128.4 CANNED RHUBARB

128.9 MISCELLANEOUS CANNED VEGETABLES

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Truffles. Covers identity, label statement of optional ingredients, and source.

129. MISCELLANEOUS VEGETABLE FOOD PRODUCTS

129.1 PICKLES AND SAUCES

129.11 Pickles and Pickled Olives

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Cucumber Pickles (Canned, Bottled, or Barrelled), 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade; four types—dill (natural cured or genuine and processed or imitation), sour, sweet, and sweet mixed or sour mixed; and three styles—whole, sliced, and cut. Gives definition, explanation of terms, fill of container, size designation (midget, gherkin, sweet, medium, large, jumbo, and dixie), and factors used in ascertaining the grade rating including uniformity of color, uniformity of size, symmetry, absence of defects, and character and texture.

U. S. Gov., Federal Specification JJJ-P-391a; 1937. Amendment 2; 1939. Pickles and Relish. Covers five types—(I) cucumber pickles (whole), sweet and sour; (II) cucumber pickled (whole) dill, imitation and genuine; (III) mixed pickles (cut), sweet and sour; (IV) chow-chow, sweet and sour; and (V) sweet pickle relish. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh cucumbers, *see* 122.3; methods of analysis, grading regulations, food laws, *see* 120; fresh and pickled olives, *see* 131.4.

129.12 Catsup, Tomato Puree, Tomato Paste

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Tomato Catsup, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, head space and fill requirements, can size, maximum head space, and factors used in ascertaining the grade rating including color, consistency, absence of defects, and flavor.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Catsup, Ketchup, Catchup. Covers identity and label statement of optional ingredients.

U. S. Gov., Federal Specification JJJ-C-91a; 1941. Amendment 2; 1942. Catsup; Tomato. Covers two grades—fancy and standard; and three types. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh tomatoes, canned tomatoes, *see* 122.7, 126.7; methods of analysis, food laws, *see* 126.7, 120.

129.13 Sauces

U. S. Gov., Federal Specification EE-S-71a; 1932. Sauces; Chili and Worcestershire. Covers one grade and two types—(A) chili and (B) worcestershire. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 120; tomato catsup, *see* 129.12; chili pepper, *see* 154.23.

129.14 Salad Dressing

References.—Salad oil and mayonnaise, *see* 142.94.

129.2 SOUPS

129.20 General Items

U. S. Gov., Federal Specification JJJ-S-581; 1931. Soups; Canned. Covers condensed type. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-T-581; 1932. Tomato Puree; Canned. Covers the strained tomato type in two grades—(A) fancy and (B) standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); requirements for packaging, packing and marking.

References.—Methods of analysis, food laws, *see* 120.

129.21 Bouillon Cubes and Beef Extract

130-139 FRUITS AND NUTS

130. GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Fruits and Fruit Products. Preparation of sample, determination of alcohol, moisture in dried fruits, solids, ash, sulphur in ash, protein, acidity, sucrose, reducing sugar, commercial glucose, starch, preservatives, sweetening substitutes, and tentative methods for determining insoluble solids, total sulphur including methods for sulphured products, chlorine in ash, potassium, manganese, calcium, magnesium, alcohol precipitate, pectic, tartaric, and citric acids, free mineral acids, dextrine, gelatine in jellies and jams, agar agar in jellies, added water in white grape juice, metals, and coloring matters.

California Fruit Exchange. Packs Recommended for Blue Anchor Tree Fruits—Season 1944. Gives recommended method of packing plums, peaches, pears, and apricots in various standard size crates and boxes.

California Fruit Exchange. Regulations Governing the Use of the Blue Anchor Trademark—Season 1944. A common insignia distinguishing fruit which conforms to certain known and generally accepted federal or state standards. Gives size and use of insignia; quality, color, and size standards for cherries, apricots, plums, peaches, nectarines, figs, persimmons, pears, and grapes.

Canners League of California. California Canned Fruits, 1938. Specifications for grades, general description of grades, maximum and minimum number of pieces per can, variety, grade, syrup, and description of fruit packed; method of determining drained weight, and rules for judging pro rata deliveries.

National Board of Fire Underwriters. Coloring and Ripening of Fruits and Vegetables, No.57; 1938. Recommended practice against fire and explosion hazards of process. Includes bananas, citrus fruit, apples, pears, tomatoes, celery, etc. Requirements governing use of ethylene gas, open flames, gas heaters, kerosene stoves, electric wiring, and general precautions.

131. SUBTROPICAL FRUITS, FRESH AND PRESERVED

131.1 BANANAS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Banana Powder. Covers definition, characteristics, uses, derivation, containers, grades, and substitutes.

U. S. Gov., Federal Specification Y-B-91; 1933. Amendment 2; 1938. Bananas. Covers one grade—commercial No. 1, yellow variety. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120.

131.2 CITRUS FRUITS

131.20 General Items

References.—Methods of analysis, grading regulations, food laws; *see* 130, 120.

131.21 Citron

References.—Citrus fruits of Florida and Texas, *see* 131.20; methods of analysis, grading regulations, food laws, *see* 130, 120.

131.22 Grapefruit

California Fruit Growers Exchange. Rules and Regulations Governing Fruit Packed Under the Sunkist and Red Ball Trade-Marks, 1942. Grade Specifications—Grapefruit. Gives detailed requirements for grapefruit complying with sunkist and red ball trade marks; special rules relating to grapefruit maturity; thickness of rind, and frosted and dry fruit; and wrapper and box regulations.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for California and Arizona Grapefruit, 1941. Covers six grades—U. S. fancy, U. S. No. 1, U. S. No. 2, U. S. combination, U. S. No. 3, and unclassified. Gives requirements for each grade, tolerances for each grade, standard pack, standards for export, and definitions of terms.

U. S. Gov., Federal Specification Y-G-680; 1944. Grapefruit; Fresh (California and Arizona). Covers three grades—No. 1, No. 2, and combination. Gives varieties, sizes, general requirements, and detail requirements; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

U. S. Gov., Federal Specification Y-G-682; 1943. Grapefruit; Fresh (Florida, Texas, and Localities Other Than California and Arizona). Covers six grades—(a) No. 1, (b) No. 1 bronze, (c) No. 1 russet, (d) No. 2, (e) combination, and (f) No. 2 russet. Gives requirements for varieties, sizes, general requirements, and details for each grade; general requirements, and details for each grade; methods of inspection and test; and packing, labeling, and marking for shipment.

References.—Florida and Texas grapefruit, *see* 131.20; methods of analysis, grading regulations, food laws, *see* 130, 120.

131.23 Lemons

California Fruit Growers Exchange. Rules and Regulations Governing Fruit Packed Under the Sunkist and Red Ball Trade-Marks, 1942. Grade Specifications—Lemons. Gives detailed requirements for lemons complying with sunkist and red ball trade marks; special rules relating to lemons in storage, indications of alternaria development in lemons, juice content, and frosted and dry fruit; and wrapper and box regulations.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Lemons, 1941. Covers five grades—U. S. No. 1, U. S. No. 2, U. S. combination, U. S. No. 3, and unclassified. Gives requirements for each grade, tolerances, standard pack, standards for export, and definitions of terms.

U. S. Gov., Federal Specification Y-L-231a; 1941. Amendment 2; 1942. Lemons; Fresh. Covers three U. S. Grades—No. 1, No. 2, and combination (defined in the standards issued by the U. S. Gov., Dept. of Agriculture). Gives detail requirements for each grade; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Florida and Texas lemons, *see* 131.20; methods of analysis, grading regulations, food laws, *see* 130, 120.

131.24 Limes

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Persian (Tahiti) Limes, 1939. Reissued, Feb. 1940. Covers four grades—U. S. No. 1, U. S. No. 2, U. S. combination, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

References.—Florida and Texas citrus fruits, *see* 131.20; methods of analysis, grading regulations, food laws, *see* 130, 120.

131.25 Oranges

California Fruit Growers Exchange. Rules and Regulations Governing Fruit Packed Under the Sunkist and Red Ball Trade-Marks, 1942. Grade Specifications—Oranges. Gives detailed requirements for oranges complying with sunkist and red ball trade-marks; special rules relating to oranges that have been held in storage, maturity of oranges, and frosted and dry fruit; and wrapper and box regulations.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for California and Arizona Oranges, 1941. Covers six grades—U. S. fancy, U. S. No. 1, U. S. No. 2, U. S. combination, U. S. No. 3, and unclassified. Gives requirements for each grade, tolerances, standard pack, standards for export, and definitions of terms.

U. S. Gov., Federal Specification Y-O-660; 1941. Amendment 2; 1942. Oranges; Fresh (California and Arizona).

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Covers five grades of Valencia, navels, etc.—defined in standards issued by U. S. Gov., Dept. of Agriculture—(a) fancy, (b) No. 1, (c) No. 2, (d) combination, and (e) No. 3. Gives requirements as to size, varietal characteristics, texture, dryness and mushy condition, and injury; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Y-O-662; 1942. Oranges; Fresh (Florida, Texas, and Localities Other Than California and Arizona). Covers seven grades corresponding to U.S. grades as defined in standards issued by U. S. Gov., Dept. of Agriculture. Gives requirements for varieties, sizes, juice, and grades; methods of inspection and tests (chemical analysis in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packing, labeling, and marking for shipment.

References.—Florida and Texas oranges, *see* 131.20; methods of analysis, grading regulations, food laws, *see* 130, 120; marmalades, *see* 134.54.

131.26 Tangerines

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Tangerines, 1941, and Amendment 1, effective Oct. 27, 1941. Covers seven grades—U. S. fancy, U. S. No. 1, U. S. No. 1 bronze, U. S. combination, U. S. No. 2, U. S. No. 2 russet, and U. S. No. 3, Gives requirements and tolerances for each grade, standard pack, and definitions of terms.

U. S. Gov., Federal Specification Y-T-96; 1934. Tangerines; Fresh. Covers one grade—U. S. No. 1. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Florida and Texas tangerines, *see* 131.20; methods of analysis, grading regulations, food laws, *see* 130, 120.

131.3 FIGS

Canners League of California. California Canned Fruits, 1938. Figs. Requirements as to percentage of sugar in sirup, color, freedom from blemishes, ripeness, woody stems removed, number of pieces per can, etc., for four grades.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Kodata Figs, 1941. Covers six grades—U.S. grade A or U.S. fancy, U. S. grade A split or U. S. fancy split, U. S. grade B or U. S. choice, U. S. grade B split or U. S. choice split, U. S. grade D (seconds), and off-grade. Gives definition, sirup density, explanation of terms, recommended head space and drained weights, can size, can dimensions, maximum head space, minimum drained weight, count, and factors used in ascertaining the grade rating including color, uniformity of size and symmetry, absence of defects, and character of fruit.

U. S. Gov., Federal Specification Z-F-351; 1931. Figs; Canned. Covers three types—(A) Calimyrna, (B) Kadota, and (C) Magnolia; and two grades—fancy and choice. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120.

131.4 OLIVES

California Ripe Olive Standardization Act. From the California Agricultural Code, 1935. Division V, chapter 3, article 1. Canned Fruit and Vegetables. Establishes certain standards of quality, condition and/or fill of container and requirements for marking of fruits and vegetables, including olives, packed in tin or glass containers. Covers certain produce not to be canned, canned ripe olive standards, canned olive seconds, marking for seconds, better grades, labels, and canned olive grades.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Ripe Olives, 1941. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, and off-grade; and two types—ripe olives (uniform dark color) and green-ripe olives (yellowish green to light brown color, frequently mottled). Gives definition, sizes of canned ripe olives (nine sizes), drained weight determinations, and factors used in determining the grade rating including color, uniformity of size, uniformity of symmetry, absence of defects, character of fruit, and flavor.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Processed Sicilian Style Olives, 1940. Gives definition, grades, tolerance, unclassified olives, fill of container, sizes, clean, firm, fairly well formed, damage, and normal flavor.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Salt Cured Oil Coated Olives, 1940. Gives definition, grades for salt cured oil coated olives, tolerance, unclassified olives, sizes, cut olives, and normal flavor.

U. S. Gov., Federal Specification Y-O-451a; 1944. Olives. Covers two types: (I) Green—(a) plain, unpitted and (b) stuffed, pimiento; and (II) ripe—(a) dark-ripe, unpitted, (b) green-ripe, unpitted, (c) dark-ripe, pitted, and (d) green-ripe, pitted. Gives requirements for types of pack, sizes and counts, grades, and details; methods of inspection and test; and packaging, labeling, packing, and marking for shipment.

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120.

131.5 PINEAPPLES

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Suggested Tentative U. S. Grades for Pineapples, 1931. Reissued, Aug. 1939. Does not apply to Puerto Rican Pineapples. Covers two grades—U. S. No. 1 and U. S. No. 2. Gives requirements for each grade, marking requirements for size, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Puerto Rican Pineapples, 1931. Reissued, Aug. 1939.

Covers four grades—U. S. fancy, U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade, tolerances, size and marking requirements, and definitions of terms.

U. S. Gov., Federal Specification Y-P-381; 1934. Pineapple; Fresh. Covers one grade—U. S. No.1. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120; canned pineapple, *see* 134.24.

131.6 AVOCADOS

References.—*See* references under 131.5.

131.7 POMEGRANATES

References.—*See* references under 131.5.

132. FRESH FRUITS, EXCEPT SUBTROPICAL

132.1 BERRIES, CURRANTS, AND GRAPES

132.11 Berries

American Cranberry Exchange. Cranberries, 1938. Gives general information concerning cranberries and covers varieties, grades, and brands of Cape Cod, New Jersey, and Wisconsin cranberries.

Northwest Canners Assn. Grading Rules for Fresh Fruits and Berries for Canning Purposes, 1932. Includes explanation of grading rules for fresh loganberries, fresh red raspberries, fresh black raspberries, No.1 fresh strawberries, No.1 fresh blackberries, and No.1 fresh gooseberries.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U.S. Standards for Grades of Frozen Red Raspberries, 1942. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, and off-grade. Gives definition, sugar or sirup pack, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Dewberries and Blackberries, 1928. Reissued, Sept. 1939. Covers three grades—U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Frozen Strawberries, 1944. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, and off-grade; two styles—whole strawberries and sliced strawberries; and three sizes—small, medium, and large. Gives definition, sugar or sirup pack, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Growers' Stock Strawberries for Manufacture, 1935. Reissued, Aug. 1939. Covers five grades—U.S. No.1, U. S. No.2, U. S. No.3, U. S. No.4, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Raspberries, 1931. Reissued, Aug. 1939. Covers three grades—U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Strawberries, 1942. Covers four grades, U. S. No.1, U. S. No.2, U. S. combination, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Washed and Sorted Strawberries for Freezing, 1935. Reissued, Aug. 1939. Covers two grades—U. S. No.1 and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Federal Specification Y-B-426; 1933. Blackberries; Fresh. Covers one grade—U. S. No.1. Gives requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Y-B-496; 1933. Blueberries; Fresh. Covers one grade—best commercial. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Y-C-651; 1934. Cranberries; Fresh. Covers one grade—best commercial. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Y-R-101; 1933. Raspberries; Fresh. Covers one grade—U. S. No.1, either red or black variety. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Y-S-726; 1933. Strawberries; Fresh. Covers one grade—U.S. No.1. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned berries, jams, and jellies, *see* 134.11, 134.5; methods of analysis, grading regulations, food laws, *see* 130, 120.

132.12 Currants

References.—Dried currants, *see* 133.12.

132.13 Grapes

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for American (Eastern Type) Bunch Grapes, 1943. Covers seven grades—U. S. fancy table, U. S. No.1 table, U. S. No.1 juice, U. S. fancy table mixed, U. S. No.1 table mixed, U.S. No.1 juice mixed, and unclassified.

Gives requirements for each grade, application of tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for American (Eastern Type) Bunch Grapes for Processing and Freezing, 1943. Covers three grades—U.S. No.1, U.S. No.2, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Juice Grapes, 1939. Applies only to European or Vinifera type. Covers five grades—U. S. No.1, U. S. No.1 mixed, U. S. No.2, U. S. No.2 mixed, and unclassified. Gives requirements for each grade, tolerances, color, and maturity requirements, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Sawdust Pack Grapes, 1939. Apply only to European or Vinifera type. Covers three grades—U. S. fancy sawdust pack, U. S. No. 1 sawdust pack, and unclassified. Gives requirements for each grade, tolerance, maturity and color requirements, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Table Grapes, 1939. Applies only to the European or Vinifera type. Covers three grades—U. S. fancy table, U. S. No.1 table, and unclassified. Gives requirements for each grade, tolerance, maturity and color requirements, and definitions of terms.

U. S. Gov., Federal Specification Y-G-671a; 1941. Amendment 2; 1944. Grapes; Fresh. Covers No.1 table grapes, either eastern or western grown, of several varieties. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

References.—Raisins, canned grapes, *see* 133.13, 134.13; methods of analysis, grading regulations, food laws, *see* 130, 120.

132.2 FLESHY FRUITS

132.21 Apples

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 143. Revised, 1938. Grades, Requirements, and Regulations of the Secretary of Agriculture for Carrying Out the Provisions of the Export Apple and Pear Act of June 10, 1933 (48 Stat. 123, 7 U. S. C., Secs. 581-589). Covers definitions and regulations.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No.154. U. S. Standards for Apples, 1937. Reissued, Oct. 1939. Covers nine U. S. grades—fancy, No.1, commercial, No.1 early, utility, utility early, combination grades, hail, and unclassified. Gives requirements for each grade, percentage of red color for apples of fancy and No.1 grades, tolerances for grades, condition after storage or transit, size, packing and marking, definitions, and standards for export.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Cannery Apples, 1930. Reissued, Aug. 1939. Covers three grades—U. S. No.1, U. S. No.2, and ciders. Gives requirements for each grade and minimum size.

References.—Dried apples, canned apples, and apple sauce, *see* 133.21, 134.21; methods of analysis, grading regulations, food laws, *see* 130, 120.

132.22 Pears

Northwest Canners Assn. Grading Rules for Fresh Fruits and Berries for Canning Purposes, 1932. Includes explanation of grading rules for fresh pears.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 143. Revised, 1938. Grades, Requirements, and Regulations of the Secretary of Agriculture for Carrying Out the Provisions of the Export Apple and Pear Act of June 10, 1933 (Stat. 123, 7 U. S. C., Secs. 581-589). Covers definitions and regulations.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Pears for Canning, 1939. Reissued, Sept. 1939. Covers three grades—U. S. No.1, U. S. No.2, and culls. Gives requirements for each grade, size classification, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Summer and Fall Pears Such As Bartlett, Hardy, and Other Similar Varieties, 1940. Covers four grades—U. S. No.1, U. S. No.2, U. S. combination, and unclassified. Gives requirements for each grade, tolerances, definitions of terms, and standard pack.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Winter Pears Such As Anjou, Bosc, Winter Nelis, Comice, and Other Similar Varieties, 1940. Covers five grades—U.S. extra No.1, U.S. No.1, U. S. No.2, U. S. combination, and unclassified. Gives requirements for each grade, tolerances, definitions of terms, and standard pack.

U.S. Gov., Federal Specification Y-P-167; 1945. Pears; Fresh, Summer and Fall. Covers three grades—(a) No.1, (b) combination, and (c) No.2. Gives requirements for varieties, sizes, and details for each grade; method of inspection and test (chemical analyses, if required, in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

U.S. Gov., Federal Specification Y-P-169; 1945. Pears; Fresh, Winter. Covers four grades—(a) extra No.1, (b) No.1, (c) combination, and (d) No.2. Gives requirements for varieties, sizes, and details for each grade; methods of inspection and test (chemical analysis, if required, in accordance with methods of Assn. of Official Agricultural Chemists); packing, labeling, and marking for shipment.

References.—Dried pears, canned pears, *see* 132.22, 134.22; methods of analysis, grading regulations, food laws, *see* 130, 120.

132.23 Quinces

132.3 MELONS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Cantaloupes, 1937. Reissued, Sept. 1939. Covers three grades—U. S. No. 1, U. S. commercial, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Honey Dew and Honey Ball Type Melons, 1937. Reissued, Aug. 1939. Covers four grades—U. S. No. 1, U. S. commercial, U. S. No. 2, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Watermelons, 1939. Covers four grades—U. S. No. 1, U. S. No. 2, U. S. No. 3, and unclassified. Gives requirements for each grade, tolerances, size, weights, and definitions of terms.

U. S. Gov., Federal Specification Y-C-96a; 1945. Cantaloupes; Fresh. Covers two grades—(a) No. 1 and (b) commercial. Gives requirements for sizes and grades; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification Y-M-211; 1933. Melons (Honey Dew, Honey Ball, Persian or Casaba); Fresh. Covers one grade—U. S. No. 1. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists): and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Y-W-121a; 1941. Amendment 1; 1942. Watermelons. Covers three U. S. grades—Nos. 1, 2, and 3 (defined in standards issued by U. S. Gov., Dept. of Agriculture). Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analyses, grading regulations, food laws, *see* 130, 120.

132.4 STONE FRUITS

132.41 Apricots

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Apricots, 1926. Reissued, Mar. 1942. Covers three grades—U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements for each grade, marking, packing, and definitions of terms.

U. S. Gov., Federal Specification Y-A-621a; 1941. Amendment 1; 1942. Apricots; Fresh. Covers two U. S. grades—defined in standards issued by U. S. Gov., Dept. of Agriculture—(a) No. 1 and (b) No. 2. Gives requirements for each grade; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists): and requirements for packaging, packing, and marking.

References.—Dried apricots, canned apricots, *see* 133.41, 134.41; methods of analysis, grading regulations, food laws, *see* 130, 120.

132.42 Cherries

Northwest Canners Assn. Grading Rules for Fresh Fruits and Berries for Canning Purposes, 1932. Includes explanation of grading rules for fresh cherries, and No. 1 fresh sour cherries.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Frozen Red Sour Pitted Cherries, 1942. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container, sugar or sirup pack, explanation of terms, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Red Sour Cherries for Manufacture, 1941. Covers three grades—U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements for each grade, tolerance, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Sweet Cherries, 1927. Reissued, Aug. 1939. Covers two grades—U. S. No. 1 and unclassified. Gives requirements for each grade, tolerance, size, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Sweet Cherries, for Export for Sulphur Brining, 1940. Covers one grade—U. S. No. 1. Gives requirements for this grade, size, and definitions of terms.

U. S. Gov., Federal Specification Y-C-306; 1934. Cherries; Fresh. Covers one grade—U. S. No. 1. Gives detail requirements; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Canned cherries, *see* 134.42; methods of analysis, grading regulations, food laws, *see* 130, 120.

132.43 Dates

U. S. Gov., Federal Specification Y-D-126; 1938. Dates; Unpitted. Covers two varieties—Deglet Noor and Invert sugar; and five grades—extra fancy, fancy, choice, hydrated, and dry. Gives detail requirements; method of inspection and test (chemical analyses in accordance with method of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

132.44 Peaches

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Freestone Peaches for Canning or Freezing, 1942. Covers three grades—U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements for each grade, minimum size, tolerances, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Nectarines, 1938. Reissued, 1942. Covers six grades—U. S. fancy, U. S. extra No. 1, U. S. No. 1, U. S. No. 2, U. S. combination, and unclassified. Gives requirements for each grade, tolerances, and definitions.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Peaches, 1933. Reissued, July 1939. Covers five grades—U. S. fancy, U. S. extra No. 1, U. S. No. 1,

U. S. No. 2, and unclassified. Gives requirements for each grade, tolerances, marking requirements for size, standard pack, and definitions of terms.

U. S. Gov., Federal Specification Y-P-151a; 1941. Amendment 2; 1942. Peaches; Fresh. Covers four U. S. grades—(a) fancy, (b) extra No. 1, (c) No. 1, and (d) No. 2, (defined in standards issued by U. S. Gov., Dept. of Agriculture). Gives detail requirements: method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Dried peaches, canned peaches, *see* 133.44, 134.44; methods of analysis, grading regulations, food laws, *see* 130, 120.

132.45 Plums and Prunes

Northwest Canners Assn. Grading Rules for Fresh Fruits and Berries for Canning Purposes, 1932. Includes explanation of grading rules for No. 1 fresh prunes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Plums and Prunes (Fresh), 1937. Reissued, Aug. 1939. Covers four grades—U. S. fancy, U. S. No. 1, U. S. No. 2, and unclassified. Gives requirements and tolerances for each grade, standard pack, and definitions of terms.

U. S. Gov., Federal Specification Y-P-506a; 1941. Amendment 1: 1942. Plums and Prunes; Fresh. Covers three U. S. grades—(a) Fancy, (b) No. 1, and (c) No. 2 (defined in standards issued by U. S. Gov., Dept. of Agriculture). Gives detail requirements; methods of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Dried prunes, canned plums and prunes, *see* 133.45, 134.45; methods of analysis, grading regulations, food laws, *see* 130, 120.

132.46 Persimmons

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120.

133. DRIED AND EVAPORATED FRUITS

133.1 DRIED BERRIES, CURRANTS, AND GRAPES

133.11 Dried Berries

References.—Fresh berries, jams and jellies, *see* 132.11, 134.5.

133.12 Dried Currants

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Dried Zante Currants, 1943. Covers three grades—U. S. grade A, U. S. grade B, and off-grade; and two types—(I) black and (II) white. Gives definition, table showing defects, and explanation of terms.

U. S. Gov., Federal Specification Z-C-851a; 1944. Currants: Dried (Processed). Covers two types—(I) Zante type (domestic) and (II) other types (foreign); and two grades—A and B. Gives requirements for material, workmanship, and details for each grade; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packaging, labeling, packing, and marking for shipment.

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120.

133.13 Raisins

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Processed Raisins, 1942. Covers three grades—U. S. grade A, U. S. grade B, and off-grade; and three types—(I) Thompson seedless (sultanina), (II) muscats, and (III) sultana. Gives definition, explanation of terms, size, color, defects, and details covering type I—bleached (natural), sulphur bleached or golden bleached, and soda dipped; type II—seeded (seeds removed), unseeded (loose), and soda dipped unseeded (Valencia); and type III.

U. S. Gov., Federal Specification Z-R-71b; 1939. Raisins. Covers three types: (I) Thompson seedless—(a) unbleached, (b) sulphur bleached, and (c) soda dipped; (II) muscats—(a) seeded, (b) unseeded, and (c) soda dipped unseeded; and (III) sultana. Gives requirements for sizes, color, grades, and details for each type and grade; methods of inspection and test, and packaging, labeling, packing, and marking.

References.—Fresh grapes, canned grapes, *see* 132.13, 134.13; methods of analysis, grading regulations, food laws, *see* 130, 120.

133.2 FLESHY FRUITS, DRIED

133.21 Dried Apples

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1942. Definitions for dried apple pomace and dried apple pectin pulp.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Dried Apples, 1943. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, and off-grade; and three styles—rings, quartered, and sliced. Gives definition, explanation of terms, and details.

U. S. Gov., Federal Specification Z-A-613b; 1943. Apples; Evaporated (or Dried). Covers two types—(I) sliced (rings) and (II) quartered (3, 4, or 6 pc.); in three grades—(A) fancy, (B) extra choice, and (C) choice. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh apples, canned apples, and apple sauce, *see* 132.21, 134.21; methods of analyses, grading regulations, food laws, *see* 130, 120.

133.22 Dried Pears

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Dried Pears, 1942. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standards, and off-grade; and six sizes—No. 1 (jumbo), No. 2 (extra large), No. 3 (large), No. 4 (medium), No. 5 (small), and No. 6 (extra small). Gives definition and explanation of terms.

U. S. Gov., Federal Specification Z-P-206; 1943. Pears: Evaporated (or Dried). Covers six sizes and three grades. Shall be prepared from any established market variety of fruit of the latest crop, and shall be processed and packed under sanitary conditions in accordance with good commercial practice. Gives details for sizes, grades, methods of inspection, tests, packaging, labeling, packing, and marking.

References.—Fresh pears, canned pears, *see* 132.22, 134.22; methods of analysis, grading regulations, food laws, *see* 130, 120.

133.23 Dried Quinces

133.3 DRIED MELONS

133.4 DRIED STONE FRUITS

133.41 Dried Apricots

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Dried Apricots, 1942. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, and off-grade; and six sizes—jumbo, No. 1 (extra fancy size), No. 2 (fancy size), No. 3 (extra choice size), No. 4 (choice size), and No. 5 (standard size). Gives definition and explanation of terms.

U.S. Gov., Federal Specification S-A-636a; 1942. Apricots; Evaporated (or Dried). Covers four grades—fancy, extra choice, choice, and standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh apricots, canned apricots, *see* 132.41, 134.41; methods of analysis, grading regulations, food laws, *see* 130, 120.

133.42 Dried Cherries

References.—Fresh cherries, canned cherries, *see* 132.42, 134.42.

133.43 Dried Dates

133.44 Dried Peaches

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Dried Peaches, 1942. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, and off-grade; six sizes—No. 1 (jumbo), No. 2 (extra fancy); No. 3 (fancy), No. 4 (extra choice), No. 5 (choice), and No. 6 (standard); and two types—freestone (Muir variety, Lovell variety, and other varieties or mixed) and clingstone. Gives definition and explanation of terms.

U. S. Gov., Federal Specification Z-P-193a; 1943. Peaches; Evaporated (or Dried). Covers two types—(I) Freestone and (II) Clingstone; and three grades—(A) fancy, (B) choice, and (C) standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh peaches, canned peaches, *see* 132.44, 134.44; methods of analysis, grading regulations, food laws, *see* 130, 120.

133.45 Dried Plums and Prunes

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Dried Prunes, 1941. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice; U. S. grade C or U. S. standard, and off-grade; three types—(I) French, (II) Italian, and (III) imperials, sugars, or a mixture; and designation for sizes of each type. Gives definition, minor defects, major defects, and explanation of terms.

U. S. Gov., Federal Specification Z-P-681c; 1941. Amendment 1; 1942. Prunes; Evaporated (or Dried). Covers three types—(I) French, (II) Italian, and (III) imperials, sugars, or a mixture of the two; sizes for each type; and three grades—(A) fancy, (B) choice, and (C) standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh plums and prunes, canned plums and prunes, *see* 132.45, 134.45; methods of analysis, grading regulations, food laws, *see* 130, 120.

133.5 DRIED SUBTROPICAL FRUITS

References.—Dried figs, *see* 131.3; dried dates, *see* 133.43; dried citron, *see* 131.21.

134. CANNED AND PRESERVED FRUITS, JAMS, AND JELLIES

134.0 GENERAL ITEMS

National Canners Assn. Manual for Canned Food Labels, 1942. Definitions and Standards N. C. A. Recommended Terms. Fruits. Covers apple sauce, apricots, blackberries, boysenberries, gooseberries, loganberries, black raspberries, red raspberries, strawberries, youngberries, currants, figs, fruits for salads, grapefruit, grapes, olives (ripe), peaches, pears, plums (green gage and egg), plums (prune), and prunes (dried).

134.1 CANNED BERRIES, CURRANTS, AND GRAPES

134.11 Canned Berries

Northwest Canners Assn. Specifications for Canned Fruits and Vegetables, 1935. Includes variety, grade, syrup, and description of packed loganberries, red raspberries, youngberries, black raspberries, strawberries, gooseberries, and blackberries.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Blackberries, 1940. Covers six grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, U. S. grade D (seconds), U. S. grade E (water or pie pack), and off-grade (substandard). Gives definition, heavy pack, sirup density, explanation of terms, recommended head space and drained weights, can size, can dimensions, maximum capacity, maximum head space, minimum drained weight, and factors used in ascertaining the grade rating including color, uniformity of size, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S.

Standards for Grades of Canned Red Raspberries, 1940. Covers six grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, U. S. grade D (seconds), U. S. grade E (water or pie-pack), and off-grade (substandard). Gives definition, sirup density, explanation of terms, recommended head space and drained weights, can size, can dimensions, maximum capacity, maximum head space, minimum drained weight, and factors used in ascertaining the grade rating including color, uniformity of size, absence of defects, and character of fruit.

U.S. Gov., Federal Specification Z-B-421; 1931. Amendment 2; 1934. Blackberries; Canned. Covers four grades—(A) fancy, (B) choice, (C) standard, and (D) water or pie. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Z-B-491; 1931. Amendment 1; 1934. Blueberries (Huckleberries); Canned. Covers two grades—(A) fancy and (B) water. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U.S. Gov., Federal Specification Z-L-501; 1931. Amendment 1; 1934. Loganberries; Canned. Covers three grades—(A) fancy, (B) choice, and (C) water or pie. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U.S. Gov., Federal Specification Z-R-91; 1931. Amendment 1; 1934. Raspberries; Canned. Covers two types—(I) red (in Cuthbert, King, Ranere, and Columbia varieties) and (II) black; and four grades—(A) fancy, (B) choice, (C) standard, and (D) water or pie. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh berries, *see* 132.11; jams and jellies, *see* 134.5; methods of analysis, grading regulations, food laws, *see* 130, 120.

134.12 Canned Currants

References.—Dried currants, *see* 133.12.

134.13 Canned Grapes

Canners League of California. California Canned Fruits, 1938. Muscat Grapes. Requirements as to percentage of sugar in sirup, ripeness, freedom from blemishes, uniform size, etc., for four grades.

References.—Fresh grapes, raisins, *see* 132.13, 133.13; methods of analysis, grading regulations, food laws, *see* 130, 120.

134.2 FLESHY FRUITS, CANNED

134.21 Applesauce and Canned Apples

Northwest Canners Assn. Specifications for Canned Fruits and Vegetables, 1935. Includes variety, grade, syrup, and description of packed apples.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Apples, 1943. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container and recommended drained weight, can size, can dimensions, minimum drained weight, tolerance, and factors used in ascertaining the grade rating including color, uniformity of size, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Apple Sauce, 1934. Covers three grades—U. S. grade A (fancy), U. S. grade C (standard), and off-grade (substandard). Gives definition, condition of container, condition of package and label, fill of container, slack fill, can size, can dimensions, maximum capacity, maximum head space, and factors used in ascertaining the grade rating including color, consistency, finish, absence of defects, and flavor.

U. S. Gov., Federal Specification Z-A-611b; 1941. Apples; Canned. Covers the "heavy pack" type, with little or no free liquid, in two grades—fancy (grade A), and standard (grade C). Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Z-A-621a; 1941. Applesauce; Canned. Covers two grades—(A) fancy (B) standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh apples, dried apples, *see* 132.21, 133.21; methods of analysis, grading regulations, food laws, *see* 130, 120.

134.22 Canned Pears

Canners League of California. California Canned Fruits, 1938. Bartlett Pears. Requirements as to percentage of sugar in sirup, color, ripeness, uniform size, freedom from blemishes, and pieces per can, for four grades.

Canners League of California. California Canned Fruits, 1938. Spiced Pears. Requirements for two grades of whole fruit, peeled, for strength of sirup in degrees (Brix), for ripeness, color, freedom from blemishes, and uniform size. To be packed with the addition of vinegar, cinnamon, cloves, and other spices if desired. Number of pieces per can and permissible maximum variation.

Northwest Canners Assn. Specifications for Canned Fruits and Vegetables, 1935. Includes variety, grade, syrup, and description of packed pears.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Pears, 1942. Covers seven grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, U. S. grade D (seconds), U. S. grade E (water grade), U. S. grade F (solid-pack pie), and off-grade; and five styles—halved, quartered, sliced, diced, and whole. Gives sirup density, fill of container and recommended drained weight, count range, can size, explanation of terms, tolerance, and factors used in ascertaining the grade rating including color, uniformity of size and symmetry, absence of defects, and character of fruit.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Pears. Covers—(1) canned pears; identity, label statement of optional ingredients; (2) canned pears; quality, label statement of substandard quality; and (3) canned pears; fill of container, label statement of substandard fill.

U. S. Gov., Federal Specification Z-P-201a; 1941. Pears; Canned. Covers two types—(I) Bartlett and (II) other varieties; four styles—(1) halved, (2) quartered, (3) sliced, and (4) whole; and six grades—(A) fancy, (B) choice, (C) standard, (D) seconds, (E) water grade, and (F) solid-pack pie. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh pears, dried pears, *see* 132.22, 133.22; methods of analysis, grading regulations, food laws, *see* 130, 120.

134.23 Canned Quinces

134.24 Canned Pineapples

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Pineapple, 1943. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard (half slices or broken slices), and off-grade; and six styles—slices (whole), half slices, broken slices, crushed pineapple, titbits, and chunks. Gives definition, sirup density, fill of container and recommended drained weight, can size, count and size, explanation of terms, tolerance, and factors used in ascertaining the grade rating including color, uniformity of size and symmetry, absence of defects, and character of fruit.

U. S. Gov., Federal Specification Z-P-351b; 1943. Pineapple; Canned. Covers six styles—(I) slices, (II) titbits, (III) chunks, (IV) crushed, (V) half slices, and (VI) broken slices; and three grades—(A) fancy, (B) choice, and (C) standard. Gives requirements for material and workmanship, sirup, count and size, can size, drained weight and head space, and details for each style and grade; methods of inspection and test; and packaging, labeling, packing, and marking for shipment.

References.—Fresh pineapple, *see* 131.5; methods of analysis, grading regulations, food laws, *see* 130, 120.

134.25 Canned Grapefruit

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Grapefruit, 1943. Covers four grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S, broken, and off-grade. Gives definition, sirup density, fill of container, can size, can dimensions, explanation of terms, tolerance, and factors used in ascertaining the grade rating including drained weight, wholeness, color, absence of defects, and character of fruit.

U. S. Gov., Federal Specification Z-G-676a; 1943. Grapefruit; Canned. Covers three grades—(A) fancy, (B) choice, and (C) broken. Gives requirements for material and workmanship, sirup, drained weights and head space, can size, and details for each grade; methods of inspection and test; and packaging, labeling, packing, and marking for shipment.

134.3 CANNED MELONS

134.4 CANNED STONE FRUITS

134.41 Canned Apricots

Canners League of California. California Canned Fruits, 1938. Apricots. Includes four classes of fruit, requirements as to percentage of sugar in sirup, color, uniform size, freedom from blemishes, and pieces per can.

Canners League of California. California Canned Fruits, 1938. Spiced Apricots. Requirements for two grades of whole, peeled fruit, for strength of sirup in degrees (Brix), for ripeness, color, freedom from blemishes, uniformity in size, and pieces per can. To be packed with the addition of vinegar, cinnamon, cloves, and other spices if desired.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Apricots, 1941. Covers seven grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, U. S. grade D (seconds), U. S. grade E (seconds packed in water), U. S. grade F (solid pack-pie), and off-grade; and two styles—halved and whole. Gives definition, sirup density, explanation of terms, recommended head space and drained weights, can size, can dimensions, minimum drained weight, maximum head space, count (maximum number per can), and factors used in ascertaining the grade rating including color, uniformity of size and symmetry, absence of defects, and character of fruit.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C. 2; 1944. Definitions and Standards for Food. Canned Apricots. Covers—(1) canned apricots; identity, label statement of optional ingredients; (2) canned apricots; quality, label statement of substandard quality; (3) canned apricots; fill of container, label statement of substandard fill.

U. S. Gov., Federal Specification Z-A-631a; 1941. Apricots; Canned. Covers two styles (either unpeeled or peeled)—(I) halved and (II) whole; in six grades—(A) fancy, (B) choice, (C) standard, (D) seconds, (E) water grade, and (F) solid-pack pie. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh apricots, dried apricots, *see* 132.41, 133.41; methods of analysis, grading regulations, food laws, see *130*, *120*.

134.42 Canned Cherries

Canners League of California. California Canned Fruits, 1938. Royal Anne Cherries. Requirements as to percentage of sugar in sirup, freedom from blemishes, uniform size, and ripeness, for four grades.

Northwest Canners Assn. Specifications for Canned Fruits and Vegetables, 1935. Includes variety, grade, syrup, and description of packed Royal Anne, Bing and Lambert, black and white, and red sour cherries.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Pitted Sulphured Cherries, 1934. Covers three grades—U. S. No. 1, U. S. No. 2, and sample grade. Gives definition, machine pitted, pitted, properly matured, clean, firm, damage, serious damage, and dimensions for small, medium, and large sizes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Red Sour Pitted Cherries, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives sirup density, can size, can dimensions, maximum capacity, maximum head space, minimum drained weight, and factors used in ascertaining the grade rating including color, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Sweet Cherries, 1940. Covers six grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, U. S. grade D (seconds), U. S. grade E (water or pie), and off-grade; and two styles—pitted and unpitted. Gives sirup density, explanation of terms, recommended head space and drained weights, can size, can dimensions, maximum capacity, maximum head space. minimum drained weight, count, and factors used in ascertaining the grade rating including color, uniformity of size and symmetry, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Unpitted Sulphured Cherries, 1934. Covers three grades—U. S. No. 1, U. S. No. 2, and sample grade. Gives definition, properly matured, clean, firm, damage, serious damage, and dimensions for small, medium, and large sizes.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Cherries. Covers—(1) canned cherries; identity, label statement of optional ingredients; (2) canned cherries; quality, label statement of substandard quality; (3) canned cherries; fill of container, label statement of substandard fill.

U. S. Gov., Federal Specification Z-C-301a; 1941. Cherries; Canned. Covers three types: (I) red sour (red tart) pitted—(a) water pack (b) sirup pack; (II) light sweet—(a) unpitted (b) pitted; and (III) dark sweet—(a) unpitted (b) pitted; in two grades—(A) fancy and (C) standard—for type I; and in six grades—(A) fancy, (B) choice, (C) standard, (D) seconds, (E) water or pie, and (F) heavy-pack pie—for types II and III. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh cherries, *see* 132.42; methods of analysis, grading regulations, food laws, *see* 130, 120.

134.43 Canned Dates

134.44 Canned Peaches

Canners League of California. California Canned Fruits, 1938. Peaches. Includes yellow cling, sliced yellow cling, yellow free, and spiced peaches; requirements on percentage of sugar in sirup, color, ripeness, uniform size, freedom from blemishes, and pieces per can for four grades of peaches—two grades of whole spiced peaches and two grades of halved spiced peaches.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Peaches (Freestone), 1940. Covers seven grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, U. S. grade D (seconds), U. S. grade E (water or pie-pack), U. S. grade F (solid pie-pack), and off-grade; and two styles—halved and sliced. Gives sirup density, explanation of terms, recommended head space and drained weights, can size, can dimensions, maximum capacity, maximum head space, minimum drained weight, count, and factors used in ascertaining the grade rating including color, uniformity of size and symmetry, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Yellow Clingstone Peaches, 1942. Covers five grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, U. S. grade D, and off-grade; and five styles—halved, quartered, diced, sliced, and whole. Gives sirup density, fill of container and recommended drained weight, can size, count, explanation of terms, tolerance, and factors used in ascertaining the grade rating including color, uniformity of size and symmetry, absence of defects, and character of fruit.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2, 1944. Definitions and Standards for Food. Canned Peaches. Covers—(1) canned peaches; identity, label statement of optional ingredients; (2) canned peaches; quality, label statement of substandard quality; and (3) canned peaches; fill of container, label statement of substandard fill.

U. S. Gov., Federal Specification Z-P-191a; 1941. Peaches; Canned. Covers two types: (I) yellow clingstone and (II) freestone—(a) yellow and (b) white; four styles—(I) halved, (II) quartered, (III) sliced, and (IV) whole; and six grades—(A) fancy, (B) choice, (C) standard, (D) seconds, (E) water grade, and (F) solid-pack pie. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh peaches, dried peaches, *see* 132.44, 133.44; methods of analysis, grading regulations, food laws, *see* 130, 120.

134.45 Canned Plums and Prunes

Canners League of California. California Canned Fruits, 1938. Plums. Requirements as to percentage of sugar in sirup, freedom from blemishes, uniform size, etc., for four grades.

Canners League of California. California Canned Fruits, 1938. Prepared Prunes in Sirup. Requirements for ripeness, cleanliness, soundness, odor, color, and flavor of dried prunes. For uniformity in size, based on number per pound, for percentage of sugar in sirup, and drained weight per can thirty days after packing for seven sizes of can.

Northwest Canners Assn. Specifications for Canned Fruits and Vegetables, 1935. Includes variety, grade, syrup, and description of packed fresh prunes, plums, yellow egg plums, and green gage plums.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Plums, 1940. Covers six grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, U. S. grade C or U. S. standard, U. S. grade D (seconds), U. S. grade E (water or pie-pack), and off-grade (substandard); three varieties—Italian prunes, green gage plums, and yellow egg plums; and two styles—whole and halves. Gives definition, sirup density, explanation of terms, recommended head space and drained weights, can size, can dimensions, maximum capacity, maximum head space, minimum drained weight, count, and factors used in ascertaining the grade rating including color, uniformity of size and symmetry, absence of defects, and character of fruit.

U.S. Gov., Federal Specification Z-P-491; 1931. Plums; Canned. Covers four types—(I) green gage, (II) yellow egg, (II) Washington, and (IV) damson; and four grades—(A) fancy, (B) choice, (C) standard, and (D) water or pie. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification Z-P-671b; 1938. Amendment 1; 1939. Prunes; Dried, Canned. Covers two types—(I) sweet type (French) (Agen) and (II) tart type (Italian); two grades—(A) fancy and (B) choice; and four sizes (number of prunes per pound)—(a) 20-30, (b) 30-40, (c) 40-50, and (d) 50-60. Gives detail requirements and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh plums and prunes, dired prunes, *see* 132.45, 133.45; methods of analyses, grading regulations, food laws, *see* 130, 120.

134.49 Miscellaneous Canned Fruits

134.5 JAMS, FRUIT BUTTERS, ETC.

134.51 Fruit Butter

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Fruit Butter. Covers identity and label statement of optional ingredients.

U. S. Gov., Federal Specification Z-A-616a; 1941. Apple Butter. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120; fruit jams made from stone fruits, *see* 134.52.

134.52 Jams

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Fruit Preserves (or Jams), 1943. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, and off-grade; and two types—prepared from a single variety of fruit and prepared from a mixture of two or more varieties of fruit. Gives definition, varieties (about thirty five kinds of fruits and berries), mold tolerances, fill of container, explanation of terms, optional saccharine ingredients, other optional ingredients, tolerance, and factors used in ascertaining the grade rating including consistency, color, and absence of defects.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S. R. A., F. D. C. 2; 1944. Definitions and Standards for Food. Fruit Preserves, Jams. Covers identity, label statement of optional ingredients.

U. S. Gov., Federal Specification Z-J-96; 1941. Jams (Preserves); Fruit. Covers two types—(I) prepared from a single variety of fruit and (II) prepared from a mixture of two varieties of fruits. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for for packaging, packing, and marking.

References.—Methods of analyses, grading regulations, food laws, *see* 130, 120.

134.53 Jellies

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Fruit Jellies. Covers identity, label statement of optional ingredients.

U. S. Gov., Federal Specification Z-J-191a; 1941. Amendment 1; 1942. Jellies; Fruit. Covers two types—(I) peepared from a single fruit and (II) prepared from a mixture of two kinds of fruit. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120.

134.54 Marmalades

U. S. Gov., Federal Specification Z-M-106; 1938. Marmalade. Covers one grade—(A) fancy; three types—(I) sliced, (II) stripped (shoe peg), and (III) chopped; and five varieties—(A) bitter-orange marmalade, (B) sweet-orange marmalade, (C) grapefruit marmalade, (D) citrus-fruit marmalade, blended as follows—(1) bitter and sweet oranges (naval and Seville), (2) kumquat and other citrus fruits, (3) orange-grapefruit; and (E) mixed-fruit marmalade (grapefruit-pineapple) Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Citrus fruits, *see* 131.2; methods of analysis, grading regulations, food laws, *see* 130, 120.

134.55 Fruit Preserves

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Fruit Preserves (or Jams), 1943. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, and off-grade; and two types—prepared from a single variety of fruit and prepared from a mixture of two or more varieties of fruit. Gives definition, varieties (about thirty five kinds of fruits and berries), mold tolerances, fill of container, explanation of terms, optional saccharine ingredients, other optional ingredients, tolerance, and factors used in ascertaining the grade rating including consistency, color, and absence of defects.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Fruit Preserves, Jams. Covers identity, label statement of optional ingredients.

U. S. Gov., Federal Specification Z-J-96; 1941. Jams (Preserves); Fruit. Covers two types—(I) prepared from a single variety of fruit and (II) prepared from a mixture of two varieties of fruits. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, grading regulations, food laws, *see* 130, 120.

134.56 Fruit Salads and Sauces

Canners League of California. California Canned Fruits, 1938. Fruit Cocktails. Includes fancy and choice grades, consisting of yellow cling peaches, pears, seedless grapes, pineapple, and maraschino type cherries, requirements as to general quality of fruit; proportions of required varieties, count, weight drained fruit, and cut-out standard for sirup.

Canners League of California. California Canned Fruits, 1938. Fruit Salads. Includes fancy and choice grades, consisting of apricots, Bartlett pears, yellow cling peaches, pineapple, maraschino cherries, requirements as to general quality of fruit, proportion of required varieties, count, drained weight of fruit, and cut-out standard for sirup.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Fruit Cocktail, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade B or U. S. choice, and off-grade; and shall contain peaches, pears, pineapple, seedless grapes, and maraschino type or natural cherries. Gives definition, sirup density, explanation of terms, recommended head space and drained weights, can size, can dimensions, maximum head space, minimum drained weight, and factors used in ascertaining the grade rating including clearness of sirup, color, uniformity of size, absence of defects, and character of fruit.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Fruits for Salad, 1942. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade B or choice, and off-grade. Gives definition, proportion of fruits (yellow-cling peaches, apricots, pears, pineapple, and cherries or grapes), sirup density, fill of container and recommended drained weight, can size, can dimensions, explanation of terms, tolerance, and factors used in ascertaining the grade rating including color, uniformity of size, absence of defects, and character of fruit.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Canned Fruit Cocktail. Covers—(1) canned fruit cocktail, canned cocktail fruits, canned fruits for cocktail; identity, label statement of optional ingredients; (2) canned fruit cocktail, canned cocktail fruits, canned fruits for cocktail; quality, label statement of substandard quality; (3) canned fruit cocktail, canned cocktail fruits, canned fruits for cocktail; fill of container, label statement of substandard fill.

U. S. Gov., Federal Specification Z-F-681; 1941. Fruit-Cocktail; Canned. Covers two grades—fancy and choice. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Sugar and liquor solutions as fruit sauces, *see* 130; methods of analysis, grading regulations, food laws, *see* 130, 120.

135. NUTS

135.0 GENERAL ITEMS

135.1 ALMONDS AND ALMOND PASTE

U. S. Gov., Federal Specification Y-N-711a; 1944. Nuts (Unshelled); Assorted and Mixed (Includes Almonds). Shall be No. 1 grade and covers six kinds—(a) English walnuts, (b) pecans, (c) almonds, (d) filberts, (e) brazils, and (f) mixed nuts. Gives names, sizes, and details for each kind; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

References.—Almond extract, *see* 175.1.

135.2 CHESTNUTS

135.3 COCONUTS AND SHREDDED COCOANUT

U. S. Gov., Federal Specification Z-C-571a; 1933. Amendment 1; 1936. Cocoanut; Prepared. Covers two classes—(A) wholly of domestic manufacture and (B) of partially domestic manufacture (reprocessed); and three types—"long shred," "medium shred," and "short shred." Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Coconut oil meal, *see* 112.4; methods of analysis, grading regulations, food laws, *see* 120.

135.4 FILBERTS

U. S. Gov., Federal Specification Y-N-711a; 1944. Nuts (Unshelled); Assorted and Mixed (Includes Filberts).

Shall be No.1 grade and covers six kinds—(a) English walnuts, (b) pecans, (c) almonds, (d) filberts, (e) brazils, and (f) mixed nuts. Gives names, sizes, and details for each kind; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

135.5 PEANUTS AND PEANUT BUTTER

American Oil Chemists' Society. Methods of Analysis, Whole Peanuts and Shelled Stock, 1940. Covers apparatus, reagents, operation, calculation from partially dry to original moisture basis, free fatty acids in oil in peanuts, and calculation of crushing yields from analytical data on whole peanuts.

American Oil Chemists' Society. Methods of Sampling Peanuts, 1941. Includes apparatus, sampling car lots, truck deliveries, sacked peanuts, original samples, handling and reduction of samples, and samples for analysis.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, article 2. Peanuts. Rules 45 to 47. Covers choice unshelled peanuts, prime unshelled peanuts, and off unshelled peanuts.

National Cottonseed Products Assn. Rules, 1945. Sampling and Methods of Chemical Analysis. Peanuts. Rules 241 and 270C. Covers methods of sampling, analysis of whole peanuts and shelled stock, operation, oil, nitrogen, second moisture, calculation, free fatty acids in oil in peanuts, calculation of crushing yields from analytical data on whole peanuts.

Southeastern Peanut Assn. Bulletin D. Official Rules, 1944. Shelled Spanish Peanuts and Shelled Runner Peanuts. Covers No.1 and No.2 grades. Gives requirements for small shriveled peanuts, small pieces of peanuts, foreign material, split peanuts, damaged peanuts, moldy peanuts, dirty peanuts, wormy or worm injured peanuts, noticeably discolored skins, and badly discolored skins.

Southeastern Peanut Assn. Bulletin D. Official Rules, 1944. U. S. Standards for Farmers' Stock Runner Peanuts (1931). Covers four general classes known as No.1, No.2, No.3, and sample grade. Gives requirements for each grade, definitions of terms, explanation, and table showing requirements of U.S. standards.

Southeastern Peanut Assn. Bulletin D. Official Rules, 1944. U. S. Standards for Farmers' Stock White Spanish Peanuts (1928). Covers four general classes known as No.1, No.2, No.3, and sample grade. Gives requirements for each grade, definition of terms, explanation, and table showing requirements of U.S. standards.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Cleaned (Unshelled) Virginia Type Peanuts, 1935. Reissued, Jan. 1940. Covers three grades—U. S. jumbo hand picked, U.S. fancy hand picked, and U.S. extra hand picked. Gives requirements and tolerances for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Farmers' Stock Runner Peanuts, 1931. Covers four grades—U. S. No.1, U. S. No.2, U. S. No.3, and U. S. sample. Gives requirements and tolerances for each grade, definitions of terms, and explanation.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Farmers' Stock Virginia Type Peanuts, 1934. Reissued, Jan. 1940. Covers four grades—U.S. No.1, U.S. No.2, U.S. No.3, and unclassified. Gives requirements for each grade, kernel damage classification, size of kernel description, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Farmers' Stock White Spanish Peanuts, 1928. Reissued, Jan. 1940. Covers four grades—U.S. No.1, U.S. No.2, U. S. No.3, and U. S. sample. Gives requirements and tolerances for each grade, definitions of terms, and explanation.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Peanut Butter, 1942. Covers three grades—U. S. grade A, U. S. grade C, and off-grade; three types—fine, medium, and coarse (or chunky); and two colors—light roast and heavy roast. Gives definition, fill of container, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and flavor and color.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Shelled Runner Peanuts, 1942. Covers two grades—U. S. No.1 and U. S. No.2. Gives requirements for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Shelled Virginia Type Peanuts, 1939. Covers five grades—U. S. extra large, U. S. medium, U. S. No.1, U. S. splits, and U. S. No.2. Gives requirements and tolerances for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Shelled White Spanish Peanuts, 1939. Covers two grades—U. S. No.1 and U. S. No.2. Gives requirements and tolerances for each grade and definitions of terms.

U. S. Gov., Federal Specification Z-P-196a; 1944. Peanut Butter. Covers three types—(I) fine, (II) medium, and (III) coarse: two colors—(a) light roast and (b) heavy roast; and two grades—A and C. Gives requirements for material and workmanship and details for grades A and C: methods of inspection and test (chemical analyses shall be made in accordance with methods of the Assn. of Official Agricultural Chemists): and packaging, labeling, packing, and marking for shipment.

References.—Pressed peanuts, peanut meal, peanut oil cake, *see* 112.2; methods of analysis, grading regulations, food laws, *see* 120; peanut oil, *see* 142.6.

135.6 PECANS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Shelled Pecans, 1938. Covers three grades—U.S. No.1 halves, U. S. No.1 pieces, and unclassified. Gives requirements for grades, size of halves, size of pieces, definitions of terms, and pecan grading chart.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for

Unshelled Pecans (Improved Varieties and Large Seedlings), 1938. Covers three grades—U. S. No. 1, U. S. commercial, and unclassified. Gives requirements for each grade, tolerances, size, definitions of terms, and pecan grading chart.

U. S. Gov., Federal Specification Y-N-711a; 1944. Nuts (Unshelled); Assorted and Mixed (Includes Pecans). Shall be No. 1 grade, and covers six kinds—(a) English walnuts, (b) pecans, (c) almonds, (d) filberts, (e) brazils, and (f) mixed nuts. Gives names, sizes, and details for each kind; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

135.7 WALNUTS

California Walnut Growers Assn. Exhibit A, 1944. Size and Variety or Type Specifications for Merchantable Unshelled Walnuts. Gives requirements for varietal packs including large, medium, and babies; seedling or mixed packs including large soft shells, medium soft shells, baby soft shells, and No. 1's or No. 1 soft shell; and special packs including mammoth Willson wonder, extra large Willson wonder, special Willson wonder, large special grade, jumbo soft shell, jumbo Franquette, and jumbo Mayette.

California Walnut Growers Assn. Exhibit B, 1944. Quality Grade Specifications for Merchantable Unshelled Walnuts. Gives requirements for California quality grades including first quality, second quality, and third quality; defects including insect damage, moldy kernels, shriveled kernels, blanks, rancid kernels, and black kernels; similar quality grades and defects for Oregon-Washington walnuts; and external defects.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Shelled English Walnuts (Juglans Regia), 1939. Covers seven grades—U.S. No. 1 halves, U.S. No. 1 extra light halves, U. S. No. 1 halves and pieces, U. S. No. 1 pieces, U. S. No. 2, U. S. No. 3, and unclassified. Gives requirements for each grade, tolerances, and definitions of terms, and includes English walnut grading chart.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Unshelled English Walnuts, (Juglans Regia), 1939. Covers three grades—U. S. No. 1, U. S. No. 2, and U. S. No. 3. Gives requirements for each grade, size, specifications, variety of type specifications, definitions of terms, tolerances, and English walnut grading chart.

U. S. Gov., Federal Specification Y-N-711a; 1944. Nuts (Unshelled); Assorted and Mixed (Includes English Walnuts). Shall be No. 1 grade, and covers six kinds—(a) English walnuts, (b) pecans, (c) almonds, (d) filberts, (e) brazils, and (f) mixed nuts. Gives names, sizes, and details for each kind; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

135.8 MIXED NUTS

U. S. Gov., Federal Specification Y-N-711a; 1944. Nuts (Unshelled); Assorted and Mixed. Shall be No. 1 grade and covers six kinds—(a) English walnuts, (b) pecans, (c) almonds, (d) filberts, (e) brazils, and (f) mixed nuts. Gives names, sizes, and details for each kind; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

135.9 MISCELLANEOUS NUTS AND NUT PRODUCTS

U. S. Gov., Federal Specification Y-N-711a; 1944. Nuts (Unshelled); Assorted and Mixed (Includes Brazils). Shall be No. 1 grade and covers six kinds—(a) English walnuts, (b) pecans, (c) almonds, (d) filberts, (e) brazils, and (f) mixed nuts. Gives names, sizes, and details for each kind; method of inspection and test (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and packing, labeling, and marking for shipment.

References.—Methods of analysis, inspection and grading regulations, food laws, *see* 120.

140-149 OIL SEEDS AND VEGETABLE OILS AND FATS

141. OILSEEDS

American Oil Chemists' Society. Methods of Analysis, Cottonseed, 1943. Includes laboratory sample, sampling, original moisture, fuming and grinding, second moisture, oil, and free fatty acid; cottonseed hulls for percent of oil in whole seed, in uncut meats and in picked hulls; and content of hull fiber or lint.

American Oil Chemists' Society. Methods of Sampling Cottonseed, 1944. Includes sampling cottonseed in cars before unloading, during unloading, and wagon or truck seed; and handling cottonseed samples.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, Article 1. Cottonseed. Rule 40. Covers basis cottonseed quantity index and grade, basis description, quantity index formulae, quality index and grades, basis quotation, basis settlement, cottonseed purchased on standard grades, and report forms.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, Article 17. Cottonseed Hulls. Rules 125 to 127. Covers prime cottonseed hulls, off hulls, and special contracts.

National Cottonseed Products Assn. Rules, 1945. Methods of Chemical Analysis. Cottonseed Hulls. Rule 271. Covers whole seed and uncut meats, oil, apparatus, procedure, and form of report.

National Cottonseed Products Assn. Rules, 1945. Methods of Chemical Analysis. Pot Cook Method for Determination of Cellulose Yields of Lint and Hull Fibre. Rule 272. Covers apparatus, reagents, laboratory preparation of sample, moisture determination, mixing lint and caustic solutions, digesting, washing, and drying.

National Cottonseed Products Assn. Rules, 1945. Sampling and Methods of Chemical Analysis. Rules 240 and 270A. Covers methods of sampling, sampling equipment, handling sample, preparing sample, methods of analysis, original moisture, fuming and grinding, second moisture, oil, nitrogen, free fatty acid, and calculation of analysis.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Standards for Grades of Cottonseed Sold or Offered for Sale for Crushing Purposes Within the United States, Sept. 1943. Gives determination of grade, method of determination of quantity index, determination of quality index for cottonseed (prime quality, superior quality, below prime quality, off quality, and below grade), sampling, analysis, and certification of samples and grades.

References.—Peanuts, *see* 135.5; cottonseed oil cake and meal, *see* 112.3; cocoa or cacao beans, *see* 151.1.

142. VEGETABLE OILS

142.0 GENERAL ITEMS

American Chemical Society. Standard Method for the Sampling and Analysis of Commercial Fats and Oils. Published by American Oil Chemists Society.—*See* below.

American Oil Chemists' Society. Methods of Analysis, 1941. Crismer Turbidity Test for Drying Oils. Includes sunflower oil. Covers reagents, apparatus, determination, and table of corrections for acidity of oils tested.

American Oil Chemists' Society. Methods of Analysis, 1941. Crismer Turbidity Test for Non-Drying Oils. Includes almond, olive, peanut, cocoanut, palm kernel, and palm oils. Covers reagents, apparatus, determination, and table of corrections for acidity of oils tested.

American Oil Chemists' Society. Methods of Analysis, 1941. Crismer Turbidity Test for Semi-Drying Oils. Includes cottonseed, sesame, corn, and rape oils. Covers reagents, apparatus, determination, and table of corrections for acidity of oils tested.

American Oil Chemists' Society. Standard Methods for the Sampling and Analysis of Commercial Fats and Oils, 1943. Applies to fats and fatty oils used in the soap, candle, and tanning industries, to edible fats and oils, to fats and fatty oils intended for lubricating and burning purposes, and to the raw oils used in the varnish and paint industry, but not intended for waxes. Covers sampling: analysis for moisture and volatile matter, insoluble impurities, soluble mineral matter, fatty acids combined as mineral soap, free fatty acids, titer, unsaponifiable matter, iodine number, saponification number, melting point, softening point, slipping point, flow test, cloud test, bleach test, Halphen test (for cottonseed oil), modified Vallavecchia test, Reichert-Meissl and Polenske numbers, Kirschner value, index of refraction, specific gravity, acetyl and hydroxyl value; smoke, flash, and fire points; F. A. C. standard colors, modified Wiley melting point method, thiocyanogen method, and Twitchell method.

American Oil Chemists' Society. Tentative Methods of Analysis for Sulfonated (Sulfated) Oils, 1938. Covers methods for determination of water, water and other compounds volatile at about 100° C., organically combined sulphuric anhydride, and inorganic sulphates and chlorides.

American Society for Testing Materials, D 94-44; 1944. American Petroleum Institute Standard, 547-44. American Standards Assn., Z11.20-1944. Method of Test for Saponification Number of Petroleum Products by Color-Indicator Titration. The method is applicable to new and used petroleum oils, including electrical insulating oils, and to mixtures of fats and mineral oils. Gives definition, principle of method, apparatus, reagents, blank determinations, sample, procedure, calculation, identification of fat, and reproducibility of results.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Oils, Fats, and Waxes. Preparation of sample, determination of specific gravity, index of refraction, melting point, titer test, iodine absorption number, saponification number, soluble and insoluble acids, Kerschner value, free fatty acids, acetyl value, unsaponifiable residue; amount of cottonseed, peanut, and sesame oils; tentative methods for determination of cholesterol and phytosterol, presence of resin oil, detection of fish oils in presence of vegetable oils, detection of coloring matters.

Institute of Shortening Manufacturers, Inc. Labels for Shortening and Oils. Standard practice of the Institute. Includes hydrogenated, all-vegetable, blended, and fish oil shortenings; soybean, cottonseed, and blended cooking and salad oil; and refined cocoanut oil.

National Cottonseed Products Assn. Rules, 1945. Sampling and Methods of Chemical Analysis. Crude Vegetable Oils. Rules 242 and 274. Covers methods of sampling from barrels and tank cars, mixing sample, moisture or volatile matter, meal or impurities, free fatty acids, refining crude oils, strength and amount of sodium hydroxide solutions, and details concerning crude cottonseed oil, crude peanut oil, crude soybean oil, crude cocoanut oil, and crude corn oil.

National Cottonseed Products Assn. Rules, 1945. Sampling and Methods of Chemical Analysis. Refined Vegetable Oils. Rules 242 and 275. Covers methods of sampling from barrels and tank cars, color, flavor and odor, bleaching, cold test, free fatty acids, and moisture or volatile matter.

References.—Lovibond glasses for color determinations, *see* 914.6.

142.1 COCOANUT OIL

American Oil Chemists' Society. Methods of Analysis, Refined Cocoanut Oil, 1943. Covers apparatus and color determination, apparatus and bleaching determination, refining conditions, fatty acids of soap stock and acidulated soap stock, titer, and table of correction for acidity of oils tested.

American Oil Chemists' Society. Methods of Analysis, Crude Cocoanut Oil, 1941. Covers provisions for refining tests for settlements, mixing sample, moisture or volatile matter, meal impurities, free fatty acids, refining loss, sodium hydroxide solutions, sodium hydroxide table, lye tables, refining procedure, and calculations.

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Cocoanut Oil. Gives table showing recommended standard for cocoanut oil.

National Association of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Coconut Oil. Covers definition, constants, occurrence, impurities, grades available, uses, containers, and specifications.

National Assn. of Wool Manufacturers. Specification C-1; 1941. Cocoanut Oil. Gives requirements for iodine value, saponification value, melting point, color, free fatty acid, and odor.

New York Produce Exchange. Vegetable Oils, Waxes, and Fats. Bulk Oil Section. Cocoanut Oil. Gives requirements for maximum free fatty acid, maximum moisture and insoluble impurities, and adjustment.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Cocoanut Oil. Shall be oil obtained by pressure and not extraction unless otherwise stipulated. Gives requirements for moisture and impurities, flavor and odor, free fatty acids, and color for cocoanut oil including refined deodorized, refined, Cochin type, Ceylon type, prime crude, and crude.

References.—Cocoanut oil cake, shredded cocoanut, *see* 112.4, 135.3; methods of analysis, *see* 142.0.

142.2 CASTOR OIL

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Castor Oil. Gives table showing recommended standard for castor oil.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes description and recommended uses for sulfonated castor oil used in spotting department.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Castor Oil. Covers definition, constants, solubility, derivation, uses, grades, and containers.

U. S. Gov., Army-Navy Aeronautical Specification AN-JJJ-O-316; 1941. Oil; Castor.

U. S. Gov., Federal Specification JJJ-O-318; 1942. Amendment 1; 1942. Oil; Castor, Technical-Grade. Covers one type and grade—for lubrication of machinery requiring the use of this type of oil and for the treatment of leather. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-8C; 1941. Castor Oil (for Uses Other Than Aircraft Engine Lubrication).

References.—Castor oil, medicinal, *see* 813.1; methods of analysis, food laws, *see* 142.0, 120.

142.3 CORN OIL

American Oil Chemists' Society. Methods of Analysis, Refined Corn Oil, 1941. Covers apparatus and color determination, apparatus and bleaching determination, refining conditions, fatty acids of soap stock and acidulated soap stock, titer, and table of correction for acidity of oils tested.

American Oil Chemists' Society. Methods of Analysis, Crude Corn Oil, 1941. Covers provisions for refining tests for settlements, mixing sample, moisture or volatile matter, meal impurities, free fatty acids, refining loss, sodium hydroxide solutions, sodium hydroxide table, lye tables, refining procedure, and calculations.

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Corn (Maize) Oil. Gives table showing recommended standard for corn (maize) oil.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Corn Oil. Covers definition, constants, derivation, purity, grades, specifications, substitutes, containers, and uses.

New York Produce Exchange. Vegetable Oils, Waxes, and Fats, 1924. Corn Oil. Shall be oil obtained by pressure and not extraction unless otherwise stipulated. Gives requirements for moisture and impurities, flavor and odor, free fatty acids, and color for corn oil including prime refined deodorized, prime refined, prime crude, crude, and standard quality crude.

References.—Methods of analysis, food laws, *see* 142.0, 120; corn, corn oil cake, *see* 103.1, 112.9.

142.4 COTTONSEED OIL

American Oil Chemists' Society. Composition and Characteristics of Various Oils, 1939. American and Foreign Cottonseed Oils. Gives tables showing analysis of refined American cottonseed oils and both crude and refined foreign cottonseed oils; also tables showing analysis of crude Georgia cottonseed oils and refined Texas cottonseed oils.

American Oil Chemists' Society. Methods of Analysis, Crude Cottonseed Oil, 1938. Covers provisions for refining tests for settlements, mixing sample, moisture or volatile matter, meal impurities, free fatty acids, refining loss, sodium hydroxide solutions, sodium hydroxide table, lye tables, refining procedure, and calculations.

American Oil Chemists' Society. Methods of Analysis, Refined Cottonseed Oil, 1943. Covers apparatus and color determination, apparatus and bleaching determination, refining conditions, fatty acids of soap stock and acidulated soap stock, titer, and table of correction for acidity of oils tested.

American Oil Chemists' Society. Methods of Sampling Oil, 1941. Includes cottonseed oil in barrels, in tank cars, and soap stock and acidulated soap stock.

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Cottonseed Oil. Gives table showing recommended standard for North American cottonseed oil.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cottonseed Oil. Covers definition, constants, conversion factors, composition, derivation, characteristics and uses, grades, marketing, containers, and substitutes.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, Article 3. Cottonseed Oil—Crude. Rules 50 to 57. Covers prime crude cottonseed oil, basis prime crude cottonseed oil, off crude cottonseed oil, reddish off crude cottonseed oil, low grade cottonseed oil, cold pressed or expeller process oil, slow breaking oil, and extracted oil.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, Article 4. Cottonseed Oil—Refined. Rules 60 to 68. Covers choice summer yellow cottonseed oil, prime summer yellow cottonseed oil, prime winter yellow cottonseed oil, good off summer yellow cottonseed oil, off summer yellow cottonseed oil, reddish off summer yellow cottonseed oil, bleachable prime summer yellow cottonseed oil, prime summer white cottonseed oil, and prime winter white cottonseed oil.

New York Produce Exchange. Cottonseed Oil Futures Contracts, 1944. Prime Summer Yellow Cottonseed Oil. Shall be of American origin. Gives requirements for clear, water and settlings, flavor and odor, bleaching, color, and free fatty acids.

New York Produce Exchange. Rules Regulating Transactions in Cottonseed Products, 1936. Crude Cottonseed Oil. Definitions for four grades as to soundness of seed, flavor and odor, freedom from water and settlings, loss on refining, and ability to produce prime summer yellow oil under procedures of the National Cottonseed Products Assn.

New York Produce Exchange. Rules Regulating Transactions in Cottonseed Products, 1936. Refined Cottonseed Oil. Definitions of nine grades of summer and winter, yellow and white oils, as regards clearness, freedom from water and settlings, flavor, odor, color based on Lovibond scale, and allowable free fatty acids, and for cold test under procedures of the National Cottonseed Products Assn.

References.—Cottonseed oil for medicinal purposes, *see* 813.3; cottonseed, cottonseed oil cake and meal, *see* 141., 112.3; vegetable shortening, *see* 142.95, methods of analysis, food laws, *see* 142.0, 120; cottonseed salad oil, *see* 142.94.

142.5 OLIVE AND PALM OILS

American Oil Chemists' Society. Methods of Analysis, Refined Palm Kernel Oil, 1941. Covers apparatus and color determination, apparatus and bleaching determination, refining conditions, fatty acids of soap stock and acidulated soap stock, titer, and table of correction for acidity of oils tested.

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Palm Kernel Oil. Gives table showing recommended standard for palm kernel oil.

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Palm Oil. Gives table showing recommended standard for palm oil.

American Oil Chermist' Society. Specifications and Methods of Analysis for Olive Oil, 1939. Covers pressed oil and olive oil foots. Covers Beilstein test for the detection of halogenated solvents in oil, coin test for sulphur olive oils, and silver benzoate test for sulphur olive oils.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Palm Oil. Covers definition, constants, solubility, occurrence, impurities, grades available, uses, and marketing.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Commercial Olive Oil. Shall be clear, yellow or greenish in color. Gives requirements for free fatty acid and moisture and insoluble impurities.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Palm Kernel Oil. Gives requirements for free fatty acid, as Lauric, and moisture and insoluble impurities.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Palm Oil. Gives requirements for free fatty acid allowance, and moisture and impurities.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Sulfur Olive Oil (Olive Oil Foots). Shall be derived by extraction with a volatile solvent. Gives allowance for combined moisture and insoluble impurities for prime green and choice green.

New York Produce Exchange. Vegetable Oils, Waxes and Fats, 1924. Olive Oil. For manufacturing purposes commonly known as the commercial grade. Gives requirements for allowable percentage of moisture and for sediment, free fatty acids, color, olive oil foots of sulphur olive oil (extracted by bisulphide of carbon), and olive oil foots.

New York Produce Exchange. Vegetable Oils, Waxes and Fats, 1924. Palm Oil. Gives requirements as to origin and allowance to be made for dirt and water.

U. S. Gov., Federal Specification Z-O-351; 1931. Oil; Olive (Edible Grade). Covers one type and grade—table use, first quality. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Olive oil for medicinal purposes, *see* 813.6; methods of analysis, food laws, *see* 142.0, 120.

142.6 PEANUT OIL

American Oil Chemists' Society. Methods of Analysis, Crude Peanut Oil, 1941. Covers provisions for refining tests for settlements, mixing sample, moisture or volatile matter, meal impurities, free fatty acids, refining loss, sodium hydroxide solutions, sodium hydroxide table, lye tables, refining procedure, and calculations.

American Oil Chemists' Society. Methods of Analysis, Refined Peanut Oil, 1943. Covers apparatus and color determination, apparatus and bleaching determination, refining conditions, fatty acids of soap stock and acidulated soap stock, titer, and table of correction for acidity of oils tested.

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Peanut (Arachis) Oil. Gives table showing recommended standard for peanut (arachis) oil.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Peanut Oil. Covers definition, constants, constituents, derivation, uses, grades, containers, and substitutes.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, Article 5. Peanut oil—Crude. Rules 70 to 72. Covers prime crude peanut oil, basis prime peanut crude oil, and off crude peanut oil.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, Article 6. Peanut Oil—Refined. Rules 73 to 75. Covers choice peanut oil, prime yellow peanut oil, and good off yellow peanut oil.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Peanut Oil. Gives requirements for free fatty acid, combined moisture and insoluble impurities, and allowance.

New York Produce Exchange. Vegetable Oils, Waxes and Fats, 1924. Peanut Oil. Shall be oil obtained by pressure and not extraction unless otherwise stipulated. Gives requirements for moisture and impurities, flavor and odor, free fatty acids, and color for peanut oil including refined deodorized, prime refined, prime crude, crude, and fair average quality crude.

Southeastern Peanut Assn. Bulletin D. Official Rules, 1944. Peanut Oil—Crude. Gives requirements for choice crude peanut oil, prime crude peanut oil, basis prime crude peanut oil, and off crude peanut oil.

Southeastern Peanut Assn. Bulletin D. Official Rules, 1944. Peanut Oil—Refined. Gives requirements for choice peanut oil, prime yellow peanut oil, and good off yellow peanut oil.

U. S. Gov., Federal Specification Z-O-358; 1943. Oil; Peanut. Only properly refined and deodorized oil obtained from sound peanuts in the first pressing operation shall be acceptable under this specification. All deliveries shall conform, in every respect, to the provisions of the Federal Food, Drug, and Cosmetic Act, and regulations promulgated thereunder. Gives detail requirements; methods of inspection, and tests; and packaging, labeling, packing, and marking for shipment.

References.—Peanuts, peanut oil cake and meal, *see* 135.5, 112.2; methods of analysis, food laws, *see* 142.0, 120.

142.7 POPPY SEED AND SUNFLOWER OILS

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Sunflower Seed Oil. Gives table showing recommended standard for sunflower seed oil.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Sunflower Seed Oil. Gives requirements for free fatty acid and moisture and insoluble impurities.

References.—Methods of analysis, food laws, *see* 142.0, 120.

142.8 RAPESEED AND SESAME OILS

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Rapeseed and Sesame Oils. Gives tables showing recommended standards for rapeseed oil and sesame oil.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Rapeseed Oil. Covers definition, constants, solubility, chemical content, uses, derivation, grades, containers, and substitutes.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Sesame Oil. Gives requirements for free fatty acid, moisture and insoluble impurities, and allowance.

New York Produce Exchange. Vegetable Oils, Waxes and Fats, 1924. Rapeseed Oil. Shall be pressed. Gives requirements for free fatty acid, moisture and impurities for rapeseed oil including semirefined, refined, and guaranteed refined.

New York Produce Exchange. Vegetable Oils, Waxes and Fats, 1924. Sesame Oil. Includes hot and cold pressed oils. Gives requirements for moisture and impurities, free fatty acids, sesame oil basis fair average quality, and sesame oil guaranteed.

References.—Sesame oil for medicinal purposes, *see* 813.7; methods of analysis, food laws, *see* 142.0, 120.

142.9 MISCELLANEOUS SPECIFICATIONS FOR VEGETABLE OIL

142.91 Oleomargarine, Nut Margarine

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Oleomargarine. Covers definition, characteristics and derivation, marketing, grades, containers, uses, and substitutes.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Oleomargarine. Covers identity, label statement of optional ingredients.

U. S. Gov., Federal Specification EE-O-451a; 1942. Oleomargarine. Covers one grade and two types—(A) product containing fats and (B) product not containing animal fats. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 142.0, 120.

142.92 Vegetable Tallow

New York Produce Exchange. Vegetable Oils, Waxes and Fats, 1924. Chinese Vegetable Tallow. Gives requirements for titre, moisture and impurities, and packing.

References.—Methods of analysis, food laws, *see* 142.0, 120.

142.93 Cacao Butter

References.—Cacao butter, medicinal, *see* 813.8.

142.94 Salad Oil and Mayonnaise

U. S. Gov., Federal Specification EE-D-691a; 1943. Dressing; Salad. Covers four types—(A) mayonnaise, (B) salad dressing, (C) French dressing, and (D) all other varieties, such as tartar sauce, Thousand Island, Russian dressing, etc. Shall be of but one grade. Gives material and workmanship, general and detail requirements, methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists), and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-O-361; 1930. Amendment 3; 1935. Oil; Vegetable, Salad. Covers one grade and two types—(A) any edible vegetable oil, except olive oil; and (B) any designated type of edible vegetable oil, except olive oil. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 142.0, 120.

142.95 Vegetable Shortening

American Hospital Assn., 28-7. Lard Substitutes. Covers two types and one grade. Based on U. S. Gov., Federal Specifications EE-L-101a, and Amendment 3, for Lard Substitutes, referred to below.

U. S. Gov., Federal Specification EE-S-321; 1944. Shortening. Covers two types: (I) Lard—(a) refined, (b) service style, (c) service style with lecithin, and (d) open-kettle rendered; and (II) shortening other than lard—(a) hydrogenated (animal fats or oils, vegetable fats or oils, and mixed), and (b) blended (animal fats or oils, vegetable fats or oils, and mixed). Gives material and workmanship, general requirements, and details for each type and class; methods of inspection and test (chemical analyses shall be made in accordance with methods of the Assn. of Official Agricultural Chemists); and packaging, labeling, packing, and marking for shipment.

References.—Methods of analysis, food laws, *see* 142.0, 120; cottonseed oil, *see* 142.4.

142.96 Lavender Oil

References.—Lavender oil, medicinal, *see* 813.9.

142.97 Lemon and Orange Oils

References.—Lemon oil and orange oil for medicinal purposes, *see* 813.9.

142.99 Miscellaneous Vegetable Oils

American Oil Chemists' Society. Composition and Characteristics of Various Oils, 1943. Kapok Oil. Gives table showing analysis of refined kapok oil.

American Oil Chemists' Society. Composition and Characteristics of Various Oils, 1943. Rice Bran and Acorn Oils. Gives table showing analysis of rice bran oil and acorn oil.

American Oil Chemists' Society. Composition and Characteristics of Various Oils, 1943. Stillingia Oil. Gives table showing analysis of Chinese oil and American oil.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Babassu Oil. Covers definition, constants, derivation, shipment, grades, uses, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cashew Nut Shell Oil. Covers definition, constants, solubility, derivations, uses, grades, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Citronella Oil. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Lemongrass Oil. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Oiticica Oil. Covers definition, constants, derivation, sources, uses, shipping, and substitutes.

References.—China wood oil, *see* 848.2; perilla oil, *see* 848.4; linseed and soybean oils, *see* 143.

143. LINSEED AND SOYBEAN OILS

143.0 GENERAL ITEMS

American Chemical Society. Standard Method of Sampling and Analysis of Commercial Fats and Oils. Published by American Oil Chemists' Society.—*see* 143.1, 143.2.

American Oil Chemists' Society. Methods of Analysis, 1941. Crismer Turbidity Test for Drying Oils. Includes linseed and soybean oils. Covers reagents, apparatus, determination, and table of corrections for acidity of oils tested.

143.1 LINSEED OIL

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Linseed Oil. Gives table showing recommended standard for linseed oil.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Linseed Oil. Covers definition, constants, solubility, occurrence, grades, specifications, substitutes, containers, uses, and marketing.

References.—Linseed oil for medicinal purposes, *see* 813.5; linseed oil for paint, *see* 848.11, 848.12.

143.2 SOYBEAN OIL

American Oil Chemists' Society. Methods of Analysis, Crude Soybean Oil, 1941. Covers provisions for refining tests for settlements, mixing sample, moisture or volatile matter, meal impurities, free fatty acids, refining loss, sodium hydroxide solutions, sodium hydroxide table, lye tables, refining procedure, and calculations.

American Oil Chemists' Society. Methods of Analysis, Refined Soybean Oil, 1941. Covers apparatus and color determination, apparatus and bleaching determination, refining conditions, fatty acids of soap stock and acidulated soap stock, titer, and table of correction for acidity of oils tested.

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Soybean Oil. Gives table showing recommended standard for soybean oil.

American Society for Testing Materials, D124-41; 1941. Raw Soybean Oil. Covers specific gracity, acid number, saponification number, unsaponifiable matter, iodine number, loss on heating, appearance, color, maximum foots, and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Soybean Oil. Covers definition, constants, solubility, specifications, substitutes, containers, uses, shipping regulations, quality, and marketing.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, article 7. Soybean Oil—Crude. Rules 76 and 77. Covers prime crude soybean oil and crude soybean oil.

National Soybean Processors Assn. Year Book and Trading Rules, 1944-45. Specifications for Crude Soybean Oil for Technical Uses. Testing methods follow handbook of Official and Tentative Methods of the American Oil Chemists' Society. Covers iodine value, unsaponifiable matter, free fatty acids, moisture and volatile matter, and break (modified Gardner method).

New York Produce Exchange. Rules Governing Prime Crude Soy Bean Oil Futures Contracts, 1940. Prime Crude Soy Bean Oil. Shall be pure prime crude soybean oil of fair merchantable quality produced from domestic soybeans. Gives requirements for unsaponifiable matter, moisture and volatile matter, and break.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Extracted Soya Bean Oil. Shall be obtained by extraction process. Gives requirements for free fatty acid, moisture and insoluble impurities, and allowance.

New York Produce Exchange. Vegetable Oils, Waxes and Fats. Bulk Oil Section. Soya Bean Oil. For crude pressed. Gives requirements for free fatty acid, moisture and insoluble impurities, allowance, and rejection.

New York Produce Exchange. Vegetable Oils, Waxes and Fats, 1924. Soya Bean Oil. Shall be oil obtained by pressure and not extraction unless otherwise stipulated. Gives requirements for moisture and impurities, flavor and odor, free fatty acids, and color for soya bean oil including refined deodorized, refined, prime crude, crude, fair average quality crude,· and extracted.

U. S. Gov., Federal Specification JJJ-O-348; 1942. Oil; Soybean, Refined (for Paint and Varnish). Covers one type and grade. Gives requirements for color, specific gravity, iodine number, saponification number, unsaponifiable matter, acid number, loss on heating, and break; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52-O-10a; 1941. Oil; Soya Bean, Raw.

References.—Methods of analysis, *see* 142.0.

150-159 COCOA, COFFEE, TEA, SPICES, AND LEAVENING AGENTS

151. COCOA

151.0 GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Cacao Bean and Its Products. Preparation of sample, determination of moisture, ash, alkalinity of ash, nitrogen, fat, testing of fat for melting point, index of refraction, iodine number, saponification number, etc.; and tentative methods for determination of casein, crude fiber, starch, sucrose, milk fat in milk chocolate.

151.1 COCOA OR CACAO BEANS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cocoa Beans. Covers definition, derivation, characteristics and grades, uses, containers, marketing, and substitutes.

References.—Methods of analysis, *see* 151.0.

151.2 COCOA, POWDERED OR PREPARED

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cacao. Gives chemical composition, description, ether-soluble residue and ether-insoluble residue, assay, storage, and preparation.

U. S. Gov., Federal Specification JJJ-C-501; 1931. Cocoa. Covers the best quality and two types—(I) breakfast and (II) Dutch process. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Chocolate, *see* 151.3; methods of analysis, food regulations, *see* 151.0, 120.

151.3 CHOCOLATE, POWDERED OR PREPARED

U. S. Gov., Federal Specification JJJ-C-271; 1931. Amendment 1; 1944. Chocolate. Covers one grade and two types—(I) plain and (II) vanilla, sweetened. Gives requirements for material and workmanship and details for each type; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and packaging, packing, and marking.

References.—Cocoa, *see* 151.1, 151.2; methods of analysis, food regulations, *see* 151.0, 120.

152. COFFEE

152.0 GENERAL ITEMS

152.1 COFFEE, RAW OR GREEN

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of the U. S., 1941. Coffee. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Green Coffee. Tentative methods for macroscopic examination and for identification of coloring matters.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Coffee. Covers definition, derivation, uses, grades, marketing, containers, and substitutes.

U. S. Gov., Federal Specification HHH-C-571; 1931. Amendment 1, 1937. Coffee. Covers green coffee of two grades—(A) equal to or better than Santos No. 4 and (B) Rio or similar quality, to be not lower than Rio grade No. 4. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions of coffee, food laws, *see* 152.0, 120.

152.2 COFFEE, ROASTED

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Roasted Coffee. Preparation of sample, determination of ash, alkalinity of ash, phosphoric acid in ash, chlorides, caffeine, crude fiber, ether extract, and tentative methods for determination of macroscopic properties, moisture, soluble solids, starch, sugars, acidity, coating substances of sugar, egg, chicory, waxes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Coffee. Covers definition, derivation, uses, grades, marketing, containers, and substitutes.

U. S. Gov., Federal Specification HHH-C-571; 1931. Amendment 1; 1937. Coffee. Covers roasted coffee of two grades—(A) equal to or better than Santos No. 4

and (B) Rio or similar quality, to be not lower than Rio grade No.4; whole bean or ground. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Definitions of coffee, food laws, *see* 152.0, 120.

152.3 COFFEE SUBSTITUTES AND EXTRACT

153. TEA

153.0 GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Tea. Preparation of sample, determination of moisture, water extract, ash, alkalinity of ash, phosphoric acid in ash, ether extract, crude fiber, caffeine, and tentative methods for determination of protein, volatile oil, tannin, paraffin and waxy substances, pigments used for coloring or facing.

153.1 TEA

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Tea. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

National Assn. of Purchasing Agents. Handbook of commodity Data Sheets, Volume 2; 1944. Tea. Covers definition, characteristics and derivation, use, grades, containers, and substitutes..

U.S. Gov., Federal Specification HHH-T-191; 1931. Amendment 2; 1934. Tea. Covers four types—(A) black tea, India, Ceylon, Java, Sumatra, and Congou varieties, (B) green tea, Japan and China varieties, (C) Oolong, Formosa Oolong variety, and (D) blended or mixed teas. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, tea laws, *see* 153.0.

154. SPICES, SALT, AND VINEGAR

154.0 GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Spices. Preparation of sample, determination of soluble and insoluble ash, calcium oxide in ash, nitrogen, ether extract, alcohol extract, copper-reducing substances, starch, crude fiber, tannin, sulphur, volatile oils in mustard seed, tentative methods for determination of moisture, cold water extract, olive oil in paprika, and microscopic examination.

154.1 SPICES, BARK AND ROOT TYPE, AND HORSE RADISH

154.11 Cinnamon

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cinnamon and Cassia. Covers definition, derivation and characteristics, uses, grades, packaging, and substitutes.

U.S. Pharmacopeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cinnamon.—Description, assay, and storage, U.S.P. products of cinnamon—Aqua Cinnamomi, Oleum Cinnamomi, Spiritus Cinnamomi.

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes cinnamon—whole, and ground. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120; cinnamon extract, *see* 175.9.

154.12 Ginger

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Ginger. Covers definition, derivation and characteristics, uses, grades, containers, and substitutes.

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes ginger—ground. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120; ginger extract, *see* 175.9.

154.13 Horse Radish

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Horse Radish. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Horseradish Roots, 1936. Reissued, Feb. 1940. Covers four grades—U. S. fancy, U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade, sizes, tolerances, and definitions of terms.

References.—Methods of analysis, food laws, *see* 120.

154.19 Miscellaneous Spices of Bark and Root Type

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes turmeric—ground. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.2 SPICES, FRUIT TYPE

154.21 Allspice

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes allspice—ground and whole. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.22 Paprika

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes paprika—Hungarian style and Spanish style. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 561; 1942. Pimientos; Canned. Shall be prepared from smooth-skinned varieties of the large sweet pepper known as Pimiento. Gives requirements for preparation, size, fill of container, head space, can size, and dimensions; method of inspection and test; and packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.23 Pepper

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pepper; Black. Covers definition, description, impurities, grades, specifications, containers, uses, and sources.

New York Produce Exchange. Rules Governing Futures Transactions, 1939. Black Pepper. Includes Lampong, Aleppy and Tellicherry black pepper. Gives requirements for packing, delivery, quality, dust, dirt, stems, and chaff or extraneous matter.

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes Black Pepper (whole and ground), white pepper (ground), red pepper other than cayenne (ground), cayenne pepper (ground) and chili powder (spiced, ground). Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Fresh peppers, *see* 122.5; methods of analysis, food laws, *see* 154.0, 120.

154.3 SPICES, FRUIT SEED TYPE

154.31 Anise

References.—Methods of analysis, food laws, *see* 154.0, 120; anise extract, anise oil, *see* 175.9, 813.9.

154.32 Celery Seed

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes celery seed—whole and ground. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.33 Coriander Seed

References.—Methods of analysis, food laws, *see* 154.0, 120; oil of coriander, *see* 813.9.

154.34 Cumin Seed

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.35 Dill Seed

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.36 Fennel Seed

References.—Methods of analysis, food laws, *see* 154.0, 120; fennel oil for medicinal purposes, *see* 813.9.

154.4 SPICES, LEAF TYPE

154.41 Capers

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.42 Cloves

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Clove (Cloves). Description, purity, clove fruit or cereals, assay, and storage. U.S.P. product of clove—Oleum Caryophylli.

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes cloves—whole and ground. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120; clove extract, oil of cloves, *see* 175.9, 813.9.

154.43 Marjoram

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes marjoram—whole, and ground. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.44 Sage

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes sage—whole, rubbed, and powdered. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.45 Thyme

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes thyme—whole and powdered. Gives general and detail requirements; methods of inspection and tests. (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.49 Miscellaneous Leaf Type Spices

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes bay leaves—whole. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

154.5 SPICES, SEED TYPE

154.51 Cardamon

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cardamom Seed. Description and storage. U.S.P. product of cardamom seed—Tinctura Cardamoni Composita.

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes cardamom seed—whole. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120; oil of cardamom, *see* 813.9.

154.52 Caraway

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Caraway (Caraway Fruit, Caraway Seed). Description and storage.

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes caraway seed—whole. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120; oil caraway, *see* 813.9.

154.53 Mace

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes mace—whole and ground. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.54 Mustard

U. S. Gov., Federal Specification EE-M-821; 1931. Mustard; Prepared. Covers one type and includes the yellow (English) style, the dark (German) style, and the French style. Gives general and detail requirements: methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes mustard—whole, ground, and flour. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120; oil of mustard, *see* 813.9.

154.55 Nutmeg

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2: 1941. Spices; Ground and Whole. Includes nutmeg—whole and ground. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.0, 120; nutmeg extract, oil of nutmeg, *see* 175.9, 813.9

154.56 Saffron

References.—Methods of analysis, food laws, *see* 154.0, 120.

154.6 SALT

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1942. Iodized Salt. Requirements for percentage of iodine.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Salt; Rock. Covers definition, constants, solubility, derivation, and uses.

U. S. Gov., Federal Specification SS-S-31b; 1944. Salt; Table and Tablets. Covers one grade and three types—(A) fine ground salt, (B) evaporated salt (free running), and (C) salt tablets. Gives requirements for material and workmanship and details for each type; methods of inspection and tests; and packaging, labeling, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 587a; 1944. Salt; Rock and Evaporated (for Regeneration of Water Softeners). Covers one grade and two types—type I rock salt and type II evaporated salt (kiln dried). Gives requirements for composition, solubility and packing tendency, grease, fat, oil, pH value, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 24-18; 1926. Salt; Rock.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 78-23; 1943. Salt; Rock and Evaporated for Regeneration of Water Softeners.

References.—Sodium chloride (salt) as a chemical reagent, *see* 834.9; food laws, *see* 120.

154.7 VINEGAR

154.70 General Items

154.71 Vinegar

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Vinegar of Squill. Gives chemical composition, storage, preparation, and average dose.

U. S. Gov., Federal Specification Z-V-401a; 1940. Amendment 2; 1942. Vinegar. Covers three types—(I) cider vinegar, (II) distilled vinegar, and (III) malt vinegar. Gives detail requirements: methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 154.70, 120.

154.9 MISCELLANEOUS SPICES

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes curry powder. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

155. LEAVENING AGENTS

155.0 GENERAL ITEMS

155.1 BAKING POWDER

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Baking Powders and Baking Chemicals. Preparation of sample, total carbon dioxide, residual carbon dioxide, available carbon dioxide, neutralizing value, tartaric acid (free or combined), cream of tartar and free tartaric acid in tartrate powders, free tartaric acid, starch, aluminum, insoluble ash, iron and aluminum, calcium, potassium and sodium, phosphoric acid, sulfuric acid, ammonia, and arsenic.

U. S. Gov., Federal Specification EE-P-611; 1930. Amendment 2; 1940. Powder; Baking. Covers one grade and five types—(A) in which acid-reacting component is tartaric acid and/or its acid salts, (B) in which acid-reacting component is acid salts of phosphoric acid, (C) in which acid-reacting component is compounds of aluminum, and (D and E) in which acid-resisting components are compounds of aluminum and acid salts of phosphoric acid. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 155.0 and 120.

155.2 BAKING SODA

U. S. Gov., Federal Specification EE-S-571; 1930. Soda; Baking. Covers one grade. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Sodium bicarbonate as a medicinal agent and as a chemical reagent, *see* 834.5; methods of analysis, food laws, *see* 155.0, 834.5, 120.

155.3 CREAM OF TARTAR AND SUBSTITUTES

155.4 HOPS

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Hops. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

U. S. Gov., Federal Specification HHH-H-491; 1930. Hops. Covers one grade. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 120.

155.5 YEAST

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1944. Yeast. Defines yeast and irradiated yeast.

U. S. Gov., Federal Specification EE-Y-131; 1931. Yeast. Covers one grade and two types—(A) compressed yeast and (B) dry yeast. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of testing, food laws, *see* 120.

160-169 SUGAR, MOLASSES, SIRUP, HONEY, AND CONFECTIONERY

160. GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Sugars and Sugar Products. Sugars, Sirups, and Molasses. Preparation of sample, determination of moisture, solids, ash, alkalinity of ash, nitrogen, mineral adulterants in ash, determination of sucrose, sucrose and raffinose, glucose by polarimetric methods, chemical methods for determination of sucrose, invert, maltose, lactose, and dextrose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Sugar. Covers definition, characteristics, occurrence, manufacture, types and classes, grades, markets and marketing, and packing.

National Canners Assn. Bacterial Standards for Sugar, 1941. For use in non-acid canned foods. Covers sampling, preparation of sample, detection of flat, sour spores, total count, detection of thermophilic anaerobes not producing H_2S, detection of thermophilic anaerobes producing H_2S (sulfide spoilage), reporting results, total thermophilic spore count, flat sour spores, thermophilic anaerobic spores, and sulfide spoilage spores.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Sucrose (Cane-Sugar), Sample 17; and Dextrose (Glucose), Sample 41. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T115, 1918. New Baumé Scale for Sugar Solutions. Adopted by Manufacturing

Chemists Assn. of U. S., the National Bureau of Standards, and by all manufacturers of hydrometers. Scale is based on specific gravity values of Plato, 20° C., and the modulus 145. Tables show relation between degrees Brix or percent sucrose, specific gravity, and degrees Baumé.

161. SUGAR

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C19, 1924. Standard Density and Volumetric Tables. Includes tables of density of solubility of cane sugar.

161.1 SUGAR, GRANULATED

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sucrose (Saccharum Sugar). Description, solubility, specific rotation, ash, reaction, sulfate, chloride, calcium, heavy metals (insoluble salts, ultra-marine or Prussian blue), invert sugar, and storage.

U. S. Gov., Federal Specification JJJ-S-791a; 1943. Amendment 1; 1944. Sugar; Beet or Cane. Covers two types—(I) white, hard, refined (granulated, powdered, and tablet or cube) and (II) brown, soft (light, medium, and dark). Gives requirements for grade, material and workmanship, conformance to provisions of Federal Food, Drug, and Cosmetic Act, and details for each type; methods of inspection and tests; and packaging, labeling, packing, and marking for shipment.

References.—Methods of analysis, density tables, food laws, *see* 160; other sugars, *see* 161.2 to 161.7.

161.2 SUGAR, POWDERED

U. S. Gov., Federal Specification JJJ-S-791a; 1943. Amendment 1; 1944. Sugar; Beet or Cane. Covers two types—(I) white, hard, refined (granulated, powdered, and tablet or cube) and (II) brown, soft (light, medium, and dark). Gives requirements for grade, material and workmanship, conformance to provisions of Federal Food, Drug, and Cosmetic Act, and details for each type; methods of inspection and tests; and packaging, labeling, packing, and marking for shipment.

References.—Methods of analysis, food laws, density tables, *see* 160.

161.3 LOAF SUGAR

U. S. Gov., Federal Specification JJJ-S-791a; 1943. Amendment 1; 1944. Sugar; Beet or Cane. Covers two types—(I) white, hard, refined (granulated, powdered, and tablet or cube) and (II) brown, soft (light, medium, and dark). Gives requirements for grade, material and workmanship, conformance to provisions of Federal Food, Drug, and Cosmetic Act, and details for each type; methods of inspection and tests; and packaging, labeling, packing, and marking for shipment.

References.—Methods of analysis, density tables, food laws, *see* 160.

161.4 GRAPE AND CORN SUGAR

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dextrose (Glucose). Description, solubility, optical rotation, identification, color of aqueous solution, loss on drying, ash, reaction, chloride, sulfate, arsenic, heavy metals, dextrin, soluble starch, sulfites, and storage. U.S.P. products of dextrose—Injectio Dextrosi, Injectio Dextrose et Sodii Chloridi.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1112; 1941. Dextrose; Bacteriologic, Anhydrous Powder.

References.—Methods of analysis, density tables, food laws, *see* 160.

161.5 SOFT SUGAR

U. S. Gov., Federal Specification JJJ-S-791a; 1943. Amendment 1; 1944. Sugar; Beet or Cane. Covers two types—(I) white, hard, refined (granulated, powdered, and tablet or cube) and (II) brown, soft (light, medium, and dark). Gives requirements for grade, material and workmanship, conformance to provisions of Federal Food, Drug, and Cosmetic Act, and details for each type; methods of inspection and tests; and packaging, labeling, packing, and marking for shipment.

References.—Methods of analysis, food laws, density tables, *see* 160.

161.6 STARCH SUGAR

References.—Grape and corn sugar, *see* 161.4; methods of analysis, density tables, food laws, *see* 160.

161.7 LACTOSE, MILK SUGAR

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of the U. S., 1941. Milk-Sugar. Definition, analysis, and purity and identity for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Lactose (Milk Sugar). Description, solubility, optical rotation, identification, ash, reaction, heavy metals, dextrose, sucrose, starch or dextrin, water-insoluble substances, and storage.

References.—Methods of analysis, density tables, food laws, *see* 160.

161.9 SUGAR, MISCELLANEOUS

American Leather Chemists Assn. Methods of Sampling and Analysis. Includes Tannery Sugars, 1942. Gives requirements for preparation of sample, moisture, ash, dextrose and purity, reagents, procedure, total sugar, dextrose before inversion, iron, foam, scum, and melting point.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil-Sugars. Gives chemical composition and preparation.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1058; 1937. Saccharose; Reagent Grade.

162. HONEY

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1930. Honey. Preparation of sample, determination of moisture, ash, alkalinity of soluble ash, reducing sugars, sucrose, free acid, and tentative methods for polarization, determination of levulose, dextrose, dextrine, commercial glucose, commercial invert sugar, and diastase.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Honey. Covers definition, derivation and characteristics, uses, grades, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Honey (Clarified Honey, Strained Honey). Description, specific gravity, ash, reaction, chloride, sulfate, artificial honey, foreign coloring matter, azo dyes, starch or dextrins, free acid, and storage.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Extracted Honey, 1943. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade B, and off-grade; seven colors—water-white, extra white, white, extra light amber, light amber, amber, and dark; and two types—liquid and crystallized. Gives fill of container, density, clean fairly clean, damage, serious damage, turbidity, objectionable flavor or odor, and tolerance.

U. S. Gov., Federal Specification C-H-571; 1938. Honey. Covers extracted or strained honey in two grades—(A) fancy and (B) standard; with 7 colors—water-white, extra white, white, extra light amber, light amber, amber, and dark. Gives detail requirements; inspection and tests (chemical analysis in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking for shipment.

163. MOLASSES AND REFINERS SIRUP

163.1 MOLASSES, PUERTO RICO

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Molasses; Blackstrap. Covers definition, sources, shipping, uses, grades, conversion factors, and substitutes.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-21-17; 1939. Molasses Residuum, for Simulated HS.

References.—Methods of analysis. food laws, *see* 160.

163.2 MOLASSES, NEW ORLEANS

U. S. Gov., Federal Specification JJJ-M-576; 1938. Molasses; Sugar-Cane. Covers two grades—(1) first centrifugal and (2) second centrifugal. Gives detail requirements; methods of sampling, inspection, and tests (chemical analyses in accordance with methods of the Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—*See* 163.1.

163.3 REFINERS SIRUP

References.—Methods of analysis, food laws, *see* 160.

164. SIRUP

164.1 MAPLE SIRUP

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Sugars and Sugar Products. Maple Products. Preparation of sample of sirup and of sugar, determination of moisture, polarization, reducing sugar, sucrose, commercial glucose, ash, alkalinity of ash, conductivity value, and tentative methods for determination of lead number, malic acid value, metals.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Maple Sirup for Reprocessing, 1940. Covers five grades—U. S. grade AA (Fancy), U. S. grade A, U. S. grade B, U. S. grade C, and unclassified. Gives requirements for each grade and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Table Maple Sirup, 1940. Covers four grades—U. S. grade AA (fancy), U. S. grade A, U. S. grade B, and unclassified. Gives requirements for each grade, tolerances, packing, and definitions of terms.

U. S. Gov., Federal Specification JJJ-S-351a; 1931. Amendment 3; 1940. Sirup. Covers one grade and five types—(I) sugarcane; (II) blended, cane sugar, and refiners'; (III) blended, corn and refiners'; (IV) maple; and (V) sugar and maple.

References.—Food laws, *see* 160; sugar density scales, *see* 160.

164.2 CORN SIRUP AND GLUCOSE

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Liquid Glucose (Glucose). Description, solubility, identification, loss on drying, ash, acidity, sulfite, arsenic, heavy metals, starch, and storage.

References.—Methods of analysis, food laws, *see* 160; sugar density scales, *see* 160.

164.3 BLENDED SIRUP

U. S. Gov., Federal Specification JJJ-S-351a; 1931. Amendment 3; 1940. Sirup. Covers one grade and five types—(I) sugarcane; (II) blended, cane sugar and refiners'; (III) blended, corn and refiners'; (IV) maple; and (V) sugar and maple.

References.—Methods of analysis, food laws, *see* 160; sugar density scales, *see* 160; sugar and maple sirup, *see* 164.1.

164.4 CANE SIRUP

References.—Methods of analysis, food laws, *see* 160; sugar density scales, *see* 160.

164.5 SORGHUMS

References.—Methods of analysis, food laws, *see* 160; sugar density scales, *see* 160.

164.6 SUGAR SIRUP

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup (Sirup, Simple Syrup). Preparation, specific gravity, and storage.

References.—Sugar, *see* 161.1; methods of analysis, food laws, *see* 160; sugar density scales, *see* 160.

165. CONFECTIONERY

165.0 GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Confectionery. Preparation of sample, determination of moisture, ash, alkalinity of ash, nitrogen, sucrose, glucose, alcohol in sirups, tentative methods for determination of mineral adulterants in ash, starch, ether extract, coloring matter, and metals.

165.1 CANDY

U. S. Gov., Federal Specification EE-C-71; 1931. Candy. Covers four types—(A) chocolates, creams, or assorted; (B) bon bons, assorted; (C) hard candy, lemon drops; and (D) sugar candy, stick, or cut stick. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of analysis, food laws, *see* 165.0, 160; sugar, *see* 161.1; chocolate and chocolate coating, *see* 161.3.

165.2 CHEWING GUM

165.3 ICE CREAM

U. S. Gov., Federal Specification EE-I-116a; 1939. Ice Cream; Sherberts and Ices. Covers three types—(I) plain ice cream, fruit ice cream, nut ice cream, bisque ice cream; (II) French ice cream, French custard ice cream, ice custard, parfait; and (III) sherberts and ices. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Ice cream brick cartons, brick molds, *see* 954.1, 785.2.

170-179 BEVERAGES

170. GENERAL ITEMS

171. DISTILLED LIQUOR

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Distilled Liquors. Determination of specific gravity, alcohol, extract, ash, acidity, esters, aldehydes, furfural, fusel oil, sugars, methyl alcohol, and tentative methods for determination of coloring matters, caramel.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Brandy. Description, specific gravity, free acid, total solids, storage in wood, other tests, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Whisky (Whiskey). Description, specific gravity, free acid (total solids, glycerin, sugar), storage in wood, esters (acetone, other ketones, isopropyl alcohol, and tertiary butyl alcohol), alkaloids, caramel and certain coal tar dyes, formaldehyde, methanol, heavy metals, and storage.

References.—Food laws, strength definitions, *see* 170; alcohol, *see* 822.4.

173. WINES

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis; 1940. Wines. Preparation of sample, determination of specific gravity, alcohol, glycerol, extract, non-sugar solids, reducing sugars, sucrose, commercial glucose, ash, alkalinity of ash, phosphoric and sulfuric acids, chlorides, volatile acids, tartaric acid, tannin and coloring matter, protein, pentosans, preservatives.

State of California, Dept. of Public Health, Bureau of Food and Drug Inspection, 1942. Regulations Establishing Standards of Identity, Quality, Purity and Sanitation, and Governing the Labeling and Advertising of Wine in the State of California. Gives seven articles covering standards of identity for wine, prohibited practices, labeling requirements for wine, advertising of wine, sanitation, enforcement, and general provisions.

U. S. Gov., Treasury Dept. Federal Alcohol Administration. Regulations No.4 Relating to Labeling and Advertising of Wine, 1939. Gives articles covering definitions, standards of identity for wine, labeling requirements for wine, requirements for withdrawal of wine from customs custody, requirements for approval of labels of wine domestically bottled or packed, advertising of wine, general provisions, and appendixes.

References.—Food laws, strength definitions, *see* 170; alcohol, *see* 822.4.

175. FLAVORING EXTRACTS

175.1 ALMOND EXTRACT

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Almond Extract. Tentative methods. Determination of alcohol, benzaldehyde, benzoic acid, hydrocyanic acid, nitrobenzol.

175.2 CASSIA EXTRACT

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Cassia Extract. Tentative methods for determination of alcohol, oil, refractive index, and color reaction of oil with ferric chloride.

References.—Food laws, *see* 170.

175.3 PEPPERMINT EXTRACT

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Peppermint Extract. Tentative method for determination of alcohol and oil.

References.—Oil of peppermint for medical purposes, *see* 813.9.

175.4 VANILLA EXTRACT

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Vanilla Extract and Its Substitutes. Determination of specific gravity, alcohol, vanillin and coumarin, lead number, solids, ash, sucrose, and tentative methods for determination of glycerol, vanilla resins, color value, coloring matters.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Vanilla Beans. Covers definition, derivation, grades and sources, uses, marketing, containers, and substitutes.

U. S. Gov., Federal Specification EE-E-911a; 1941. Extracts, Flavoring; and Flavors, Non-Alcoholic. Includes vanilla—extra concentrated extract; 4X strength extract; extract; and imitation, artificially flavored and colored. Gives requirements on preparation and strength of extracts and amount of alcohol, required constituents of imitation extract; methods of inspection and testing (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, labeling, packing, and marking for shipment.

References.—Vanilla for medicinal purposes, *see* 819.9.

175.5 WINTERGREEN EXTRACT

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Wintergreen Extract. Tentative methods for determination of alcohol, oil, and methyl salicylate.

References.—Oil of wintergreen for medical purposes, *see* 813.9.

175.6 LEMON EXTRACT

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Lemon and Orange Extracts. Determination of specific gravity, alcohol, lemon and orange oils, aldehydes, citral, solids, ash, sucrose, methyl alcohol, and tentative methods for determination of glycerol, and coloring matters.

U. S. Gov., Federal Specification EE-E-911a; 1941. Extracts, Flavoring; and Flavors, Non-Alcoholic. Includes lemon—concentrated extract, extract; terpeneless extract; and non-alcoholic flavor. Gives requirements on preparation and strength of extracts and amount of alcohol, required constituents of imitation extract; methods of inspection and testing (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, labeling, packing, and marking for shipment.

References.—Oil of lemon for medical purposes, *see* 813.9; lemon oil, nonmedicinal, *see* 142.97.

175.7 ORANGE EXTRACT

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Lemon and Orange Extracts. Determination of specific gravity, alcohol, lemon, and orange oils, aldehydes, citral, solids, ash, sucrose, methyl alcohol, and tentative methods of determination of glycerol, and coloring matters.

U. S. Gov., Federal Specification EE-E-911a; 1941. Extracts, Flavoring; and Flavors, Non-Alcoholic. Includes orange—extract; terpeneless extract; and non-alcoholic flavor. Gives requirements on preparation and strength, percentages of alcohol, percentages of oil of orange and of cottonseed oil in non-alcoholic flavor; methods of inspection and testing (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, labeling, packing, and marking for shipment.

References.—Oil of orange for medical purposes, *see* 813.9; orange oil, nonmedicinal, *see* 142.97.

175.9 MISCELLANEOUS SPECIFICATIONS FOR FLAVORING EXTRACT

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Anise and Nutmeg Extracts. Tentative method for determination of oil.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Ginger Extract. Tentative methods for determination of alcohol, solids, identification of ginger and capsicum.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Nutmeg Extract. Tentative methods for determination of oil.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Spearmint Extract. Tentative method for determination of alcohol and of oil.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Licorice. Covers definition, characteristics and derivation, grades and types, uses, containers, and substitutes.

References.—Spices, *see* 154; oils of various spices for medicinal purposes, *see* 813.9.

176. MINERAL WATERS

176.0 GENERAL ITEMS

American Bottlers of Carbonated Beverages. Educational Bulletin 4; 1930. Gas Volume Test. Recommended practice on standard method for testing bottled carbonated beverages for gas volume with chart of values for use in making the determination.

176.1 SELTZERS

176.2 VICHY WATER

176.3 TABLE WATERS

U. S. Gov., Federal Specification EE-W-111; 1931. Water; Table, Effervescent. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

177. BITTERS, GINGER ALE, SARSAPARILLA ROOT BEER, BIRCH BEER

177.1 BITTERS

177.2 GINGER ALE

U. S. Gov., Federal Specification EE-G-391a; 1932. Ginger Ale. Covers two types—(I) dry and (II) aromatic or golden. Gives general and detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

References.—Methods of test, food laws, *see* 176.0, 170.

177.3 SARSAPARILLA

References.—Methods of test, food laws, *see* 176.0, 170.

177.4 ROOT BEER AND BIRCH BEER

177.5 CREAM SODA WATER

178. FRUIT JUICE BEVERAGES

178.0 GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Beverages (Non-Alcoholic) and Concentrates. Methods for determination of specific gravity, alcohol, acidity, esters, total solids, sucrose, reducing sugars, commercial glucose, ash, alkalinity of ash, preservatives, anthranilic acid esters, tentative methods for determination of citric acid, tartaric acid, coloring matters, and metals.

178.1 LEMON JUICE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Lemon Juice, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container, explanation of terms, and factors used in ascertaining the grade rating including color, absence of defects, and flavor.

178.2 LIME JUICE

178.3 ORANGE JUICE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Blended Grapefruit Juice and Orange Juice, 1943. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, explanation of terms, and factors used in ascertaining grade rating including color, absence of defects, and flavor.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Orange Juice, 1942. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container, explanation of terms, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and flavor.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Concentrated Orange Juice, 1943. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container, explanation of terms, determination of ascorbic acid (vitamin C), percentage of free and suspended pulp, acid, recoverable oil, and factors used in ascertaining the grade rating including color, absence of defects, and flavor.

178.4 GRAPE JUICE

U. S. Gov., Federal Specification Z-G-661; 1931. Grape Juice. Covers variety produced from the Concord type of grape. Covers detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

178.5 APPLE JUICE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Apple Juice, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade; and two styles—clarified (filtered) and unclarified (unfiltered). Gives definition, explanation of terms, can size, can dimensions, maximum capacity, maximum head space, and factors used in ascertaining the grade rating including color, absence of defects, and flavor.

178.6 GRAPEFRUIT JUICE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Blended Grapefruit Juice and Orange Juice, 1943. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, explanation of terms, and factors used in ascertaining grade rating including color, absence of defects, and flavor.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Grades of Canned Grapefruit Juice, 1941. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container, explanation of terms, and factors used in ascertaining the grade rating including color, absence of defects, and flavor.

U. S. Gov., Federal Specification Z-G-686; 1941. Grapefruit Juice; Canned. Covers two types—(I) unsweetened and (II) sweetened; and two grades—(A) fancy and (C) standard. Gives detail requirements; methods of inspection and tests (chemical analyses in accordance with methods of Assn. of Official Agricultural Chemists); and requirements for packaging, packing, and marking.

178.7 PINEAPPLE JUICE

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Tentative U. S. Standards for Grades of Canned Pineapple Juice, 1943. Covers three grades—U. S. grade A or U. S. fancy, U. S. grade C or U. S. standard, and off-grade. Gives definition, fill of container, explanation of terms, tolerance, and factors used in ascertaining the grade rating including color, absence of defects, and flavor.

178.9 MISCELLANEOUS FRUIT JUICES

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cherry Juice. Gives chemical composition, description, specific gravity, refractive index, ash, hydrogen-ion concentration, total solids, reducing sugars, volatile acids, arsenic, lead, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Raspberry Juice. Gives chemical composition, description, specific gravity, refractive index, identification, ash, hydrogen-ion concentration, total solids, reducing sugars, volatile acids, absence of coal-tar dyes, arsenic, assay, storage, and preparation.

179. MISCELLANEOUS BEVERAGE SPECIFICATIONS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Beers.

Preparation of sample, determination of specific gravity, alcohol, extract, degree of fermentation, lactic, acetic and phosphoric acids, reducing sugars, glycerol, ash, protein preservatives, and tentative methods for determination of color, dextrin, polarization, coloring matters, and metals.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Malt Beverages, Sirups and Extracts, and Brewing Materials.

200-299 VEGETABLE PRODUCTS

(Except Food, Fiber, and Wood)

200-209 RUBBER AND SIMILAR GUMS AND MANUFACTURES THEREOF

200. GENERAL ITEMS

American Society for Testing Materials, D 15-41; 1941. American Standards Assn., J1.1-1942. Methods of Sample Preparation for Physical Testing of Rubber Products. Apply to soft vulcanized rubber compounds such as are used for the lining and cover of hose and belting, for carcass and tread tires, and for a wide variety of molded or extruded rubber products. They are not applicable without modification to material ordinarily classed as hard rubber. Place of test, sampling, preparing samples of vulcanized rubber, age and condition of samples, temperature of test, separation of rubber, buffing, methods of testing, and retests.

American Society for Testing Materials, D 297-43T; 1943. Tentative Methods of Chemical Analysis of Rubber Products. These methods are classified into five separate procedures—(A) complete procedure, (B) rubber solvent method, (C) short procedure, (D) direct determination of rubber hydrocarbon, and (E) copper and manganese determination in crude rubber. Gives description of terms, reagents, blank determinations, check determinations, preparation of samples, preliminary examination of sample, and details for the five procedures listed above.

American Society for Testing Materials, D 314-39; 1939. Method of Test for Hardness of Rubber. For common grade of rubber such as tire treads, most automotive mechanical rubber parts, etc., but not for extremely hard or extremely soft rubbers, by measurement of indentation resistance when subjected to a definite pressure by a standard spherical surface. Includes A.S.T.M. hardness number, apparatus, test specimen, and procedure.

American Society for Testing Materials, D 394-40; 1940. Methods of Test for Abrasion Resistance of Rubber Compounds. For soft rubber compounds such as gum stocks, boot and shoe stocks, tread stocks, etc., by use of du Pont, National Bureau of Standards, and U. S. Rubber Co. abrader machines. Gives comparison standards, preparation of sample, method of procedure, and calculations.

American Society for Testing Materials, D 395-40T; 1940. Tentative Methods of Test for Compression Set of Vulcanized Rubber. For vulcanized rubber subjected to compressive stresses or shear such as machinery mountings and vibration dampers. For determination of set under constant load, and for constant deflection, description of apparatus, test specimen, heat treatment, recovery period, and report

American Society for Testing Materials, D 412-41; 1941. American Standards Assn., J2.1-1942. Methods of Tension Testing of Vulcanized Rubber. For determining stress-strain properties, tensile strength, ultimate elongation, and permanent set of soft vulcanized rubber such as tire carcass and tread compounds or most mechanical rubber goods, but not for hard rubber. Description of terms, tension test apparatus, calibration of tension testing machine, set test apparatus, die for test specimens, test specimens, number of test specimens, procedure, calculations, and report.

American Society for Testing Materials, D 413-39; 1939. American Standards Assn., J3.1-1942. Methods of Test for Adhesion of Vulcanized Rubber (Friction Test). For determination of the strength of adhesion between plies of fabric bonded with rubber or rubber attached to another material. Includes dead weight and machine methods, test specimen, description of apparatus, and procedure.

American Society for Testing Materials, D 429-39; 1939. Method of Test for Adhesion of Vulcanized Rubber to Metal. For use where rubber part is assembled between two parallel metal plates, but not for metal on one side only. Description of mold for test specimen, apparatus, laboratory tests, and tests for production parts.

American Society for Testing Materials, D 430-40; 1940. Methods of Dynamic Testing for Ply Separation and Cracking of Rubber Products. For comparative ability of soft rubber compounds to resist fatigue, such as tires, belts, footwear, and various molded goods. For ply separation by use of Scott flexing machine, and for cracking produced either by extension or bending by use of De Mattia flexing machine, or by use of du Pont flexing machine. Procedure for tires, belts, test specimen, and report.

American Society for Testing Materials, D 454-41; 1941. Method of Air Pressure Heat Test of Vulcanized Rubber. For accelerated aging test of rubber compounds designed for high-temperature service. Type of test, general methods, apparatus, test specimens, number of tests, tests of original specimens, procedure and physical test of exposed specimens, and calculations and report.

American Society for Testing Materials, D 471-44T; 1944. Tentative Methods of Test for Changes in Properties of Rubber and Rubber-Like Materials in Liquids. Intended for use in estimating the comparative ability of rubber and rubber-like compositions to withstand the effect of liquids. For intercomparisons between compounds rather than for an estimate of service performance of manufactured products. Gives types of test, test conditions, preparation of sample, and details for method A (general procedures) and method B (linear measurement method for increase in volume).

American Society for Testing Materials, D 518-44; 1944. Method of Test for Resistance to Light Checking and Cracking of Rubber Compounds. For estimating comparative resistance to sunlight and weather of soft rubber compounds, but not for hard rubber. Description of specimen, apparatus, and methods of procedures for exposed stressed straight specimen and for looped specimen.

American Society for Testing Materials, D 530-44T; 1944. Tentative Methods of Testing Hard Rubber Products. Includes chemical, physical, and electrical tests of vulcanized compositions having a ratio of combined sulfur to rubber over 15 percent. Chemical analysis using A.S.T.M. method D 297, analysis of ash, procedures for physical tests for tensile strength and elongation, impact resistance, hardness, flexural strength, cold flow, and softening point; and for dielectric strength, power factor, and surface and volume resistivity.

American Society for Testing Materials, D 531-41; 1941. Method of Test for Indentation of Rubber by Means of the Pusey and Jones Plastometer. For measure of the depth of indentation, expressed in hundredths of a millimeter, of an 1/8 inch ball loaded 1 kilogram, allowing plastic flow adjacent to the indentor. Not for determination of hardness. Describes apparatus, preparation of specimen, and test procedure.

American Society for Testing Materials, D 552-44T; 1944. Tentative Methods of Testing Cellular Rubber Products. Covers procedures for testing cellular rubber products in which the base material used in manufacture may be natural rubber, reclaimed rubber, synthetic rubber, or rubber-like materials, alone or in combination. Cellular rubbers may be vulcanized either to soft or to hard (ebonite) rubber. Gives general methods, sampling, standard test slabs, measurement of finished products, apparent density, chemical analysis, tensile strength and elongation, accelerated aging tests, compression-deflection tests, compression set under constant deflection, and flexing test.

American Society for Testing Materials, D572-42; 1942. American Standards Assn., J 4.1-1943. Method of Test for Accelerated Aging of Vulcanized Rubber by the Oxygen-Pressure Method. For use in estimating relative resistance of vulcanized rubber to age deterioration. Nature of test, general methods, apparatus, test specimens, number of test specimens, tests for unaged specimen, procedure for accelerated aging, physical tests of aged specimen, calculations, and reports, section 4(b) and section 8(b), tentatively revised 1941.

American Society for Testing Materials, D573-42; 1942. American Standards Assn., J 5.1-1942. Method of Test for Accelerated Aging of Vulcanized Rubber by the Oven Method. Intended for use in estimating the relative resistance of vulcanized rubber to age deterioration. Nature of test, general methods, apparatus, test specimens, number of test specimens, tests of unaged specimens, procedure for accelerated aging, physical tests of aged specimens, calculations, and report.

American Society for Testing Materials, D575-40T; 1940. Tentative Methods of Test for Compression-Deflection Characteristics of Vulcanized Rubber. Covers tests at specified deflection and at specified load, requirements for compression testing machine, test specimen, preparation of specimen, test conditions, nature of tests, procedures, and report.

American Society for Testing Materials, D599-40T; 1940. Tentative Method of Test for Physical State of Cure of Vulcanized Rubber (T-50 Test). Limited to rubber compounds of relatively high elongation for controlling uniformity of cure, and for correlation of combined sulfur, by stretching, freezing, and gradual warming. Description of test apparatus, test specimen, and methods of procedure.

American Society for Testing Materials, D 623-41T; 1941. Tentative Methods of Test for Compression Fatigue of Vulcanized Rubber. For use in comparing the rate of heat generation and the fatigue characteristics of vulcanized rubber compounds that may be subjected in use to dynamic compression strains. Types of test, preparation of sample; Goodrich, Firestone, and St. Joe flexometer tests; and report.

American Society for Testing Materials, D 624-44; 1944. Method of Test for Tear Resistance of Vulcanized Rubber. A procedure which is widely used for determining tear resistance of the usual grades of soft vulcanized rubber such as tire tread, carcass, and inner tube compounds, or those used in most mechanical rubber goods. It does not apply to the testing of material ordinarily classed as hard rubber. Apparatus, calibration of apparatus, preparation of sample, die for test specimens, test specimens, number of test specimens, procedure, calculation, and report.

American Society for Testing Materials, D 640-44; 1944. Methods of Sampling and Testing Latices of Natural Rubber and Synthetic Rubbers. Sampling and measuring variability in composition of normal and concentrated rubber latex and synthetic rubber latices. Sampling latex in drums and tank cars; total solids, dry rubber content, preparation of sample for chemical analysis, and report.

American Society for Testing Materials, D 676-44T; 1944. Tentative Method of Test for Indentation of Rubber by Means of the Durometer. Covers the procedure for determining the indentation of rubber by means of the durometer having a point made of hardened steel.

American Society for Testing Materials, D735-43T; 1943. Prepared in cooperation with the Society of Automotive Engineers. Tentative Specifications for Rubber and Synthetic Rubber Compounds for Automotive and Aeronautical Applications. Covers vulcanized compounds of natural rubber, reclaimed rubber, synthetic rubber, or rubber-like materials, alone or in combination, which are intended for use in manufacturing products for automotive and aeronautical applications. Gives types of compounds, classes and grades of compounds, composition and manufacture, color, physical properties, sampling, methods of testing, and inspection and rejection.

American Society for Testing Materials, D736-43T; 1943. Tentative Method of Test for Low-Temperature Brittleness of Rubber and Rubber-Like Materials. Intended to determine the ability of compounds made from rubber or rubber-like materials to resist the effect of low temperatures in causing them to become brittle so as to fracture or crack when bent. Covers apparatus, test specimens, procedure, results, and report.

American Society for Testing Materials, D 749-43T; 1943. Tentative Method of Calibrating a Light Source Used for Accelerating the Deterioration of Rubber. Intended primarily for use in measuring the intensity of radiation from the light source and may be used for measuring and integrating the intensity or total exposure from other light sources which are intermittent or variable in intensity, such as sunlight. Gives nature of test, apparatus, reagents, procedure, and calculations.

American Society for Testing Materials, D 750-43T; 1943. Tentative Method of Test for Resistance to Accelerated Light Aging of Rubber Compounds. For estimating the comparative resistance of soft vulcanized rubber compounds to deterioration when exposed to light but not intended to cover materials ordinarily classed as hard or semihard rubber. Gives nature of test, apparatus, calibration of radiation, test, specimens, precautions, procedure, and report.

American Society for Testing Materials, D 798-44T; 1944. Tentative Specifications for Cellular Rubber Products. Gives scope, description of terms, manufacture, types of cellular rubbers, classes and grades of cellular rubbers, material and workmanship, color, physical properties, sampling, methods of testing, tolerances on dimensions, packing and marking, and inspection and rejection.

American Society for Testing Materials, D 813-44T; 1944. Tentative Method of Test for Resistance of Vulcanized rubber or Synthetic Elastomers to Crack Growth. Gives scope, De Mattia flexing machine, test specimens, number of test specimens, preparation of specimen, clamping specimens in machine, adjustment of machine, procedure, and report.

American Society for Testing Materials, D 814-44T; 1944. Tentative Method of Test for Permeability of Vulcanized Rubber or Synthetic Elastomers to Volatile Liquids. Gives scope, apparatus, test specimens, procedure, and calculation and report.

American Society for Testing Materials, D 816-44T; 1944. Tentative Methods of Testing Rubber Adhesives. Gives scope, classes of tests, materials for bonded specimens, sampling, test conditions, adhesion tests, bonding range, softening point, cold flow, viscosity, stability, cold brittleness, weight per gallon, plastic deformation, and report.

American Society for Testing Materials, ES 6a; 1943. Emergency Specifications for GR-S Synthetic Rubber Sheath Compound for Electrical Insulated Cords and Cables. Covers a durable, vulcanized synthetic rubber compound suitable for use as the outside covering or sheath on insulated electric cords and cables. Gives requirements for character of sheath, methods of testing, physical requirements, sampling for original physical tests, sampling for accelerated aging tests, test specimens, and rejections.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Rubber Goods, General Instructions on Standard Methods of Tests. Emergency Specifications E-M-607-44 annuls Specification M-607-41. All inspection and tests of rubber goods shall be made in accordance with the standard methods of the A.S.T.M.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Rubber, Guayule. Covers definition, derivation and characteristics, uses, grades, containers, and substitutes.

Society of Automotive Engineers. Aeronautical Material Specification 2810; 1944. Identification of Natural and Synthetic Rubber Materials. For the identification of sheets, extrusions and moldings made of synthetic rubber, synthetic rubber cork composition, reclaimed rubber, and natural rubber stock. Gives detail requirements and code letters.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C38; 1915. Testing of Rubber Goods. Describes National Bureau of Standards procedure for testing mechanical rubber goods, including thickness measurement, test for set, tensile strength, test for adhesion of plies in rubber line hose and rubber belting, and methods of chemical analysis.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C427; 1940. Synthetic Rubbers. A Review of Their Compositions, Properties, and Uses. This circular classifies 29 commercial varieties of synthetic rubber. Brief discussions are presented concerning the raw materials used, the chemical reactions of manufacture, and the general conditions of polymerization of condensation for the various types of rubber. Published data on the different types are summarized in comparative tables of values of density, refractive index, identity period along the fiber axis, swelling in liquids, tensile strength, and permeability. The reported values of dielectric constant, power factor, and resistivity are also given.

U. S. Gov., Federal Specification ZZ-R-601a; 1940. Rubber Goods; General Specifications (Methods of Physical Tests and Chemical Analyses). Gives general physical and chemical methods for testing soft rubber goods for conformance with requirements of Federal specifications. It does not include the special test methods to certain materials which are described in appropriate specifications nor does it include all of the test methods for soft rubber goods used in the industry.

References.—Waterproofing compounds for fabrics, *see* 849.6; test methods for cotton fabrics, *see* 300.4.

201. RUBBER UNMANUFACTURED

U. S. Gov., U. S. Army Ordnance Dept. Specification 20-116; 1943. Rubber and Synthetic Rubber for General Mechanical, Aeronautical, and Automotive Application, Except Tire.

201.0 GENERAL ITEMS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Rubber. Covers definition, constants, solubility, occurrence, purity and impurities, grades, substitutes, markets and trading, containers or packaging, ordering instructions, and uses.

Society of Automotive Engineers, 1944 Handbook. Section 4—Fabricated Materials. Includes SAE Standard Classifications and Physical Requirements for Rubber Compounds, Revised 1944. These specifications include vulcanized compounds of natural rubber, reclaimed rubber, synthetic rubber or rubber-like materials, and does not include compounds for tires, inner tuber, sponge rubber, and hard rubber. Gives scope, types of compounds, classes and grades of compounds, composition and manufacture, color, physical requirements, sampling, and methods of test.

201.1 CRUDE RUBBER

Rubber Manufacturers Assn., Inc. Crude Rubber Type Descriptions and Packing Specifications for Crude Rubber, 1938. Gives requirements for various qualities of ribbed smoked sheets, thick latex crepes, thin latex crepes, thick brown crepes, thin brown crepes, remilled thick crepes, and remilled thin crepes; and crude rubber packing specifications for the various types of rubber.

Society of Automotive Engineers. Aeronautical Material Specification 3211; 1942. Rubber or Synthetic Rubber Compounds, Coolant-Resistant (55-65). For sheet, strip, tubing, molded shapes, or as ordered. Gives requirements for application, quality, requirements, samples, tolerances, reports, identification, packing and marking, approval, and rejections.

U. S. Gov., Army Air Forces Specification 26568 (1); 1940. Sheet; Latex (Uncured).

U. S. Gov., Army-Navy Aeronautical Specification AN-R-8; 1942. Rubber; Anodic.

201.2 SCRAP AND RECLAIMED RUBBER

National Assn. of Waste Material Dealers, Inc., Classification for Scrap Rubber, 1938. Definitions for 28 classes with code word and number, including rubber shoes, hose, tires, tubes, etc., and trade customs. Adopted by the Scrap Rubber Institute.

Rubber Reclaimers Assn., Inc. Scrap Rubber Specifications and Packing, 1934. Definitions for standard grades of scrap rubber including—(1) automobile tires, (2) truck tires, (3) automobile tubes, (4) truck tubes, (5) solid tires, (6) bicycle tires, (7) shoes, (8) hose, and (9) special; subdivisions of each class, and trade customs. Approved by the National Assn. of Waste Material Dealers, Inc.

201.3 SPONGE RUBBER

U. S. Gov., Army Air Forces. Specification 26578-A; 1944. Rubber; Sponge (Reclaim and Synthetic).

201.9 RUBBER, SYNTHETIC

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Rubber; Synthetic. Covers definition, properties, marketing, uses (general), and forms and containers.

Society of Automotive Engineers. Aeronautical Material Specification 3197A; 1944. Synthetic Rubber Sponge (Soft). For sheet, strip, molded shapes, or as ordered. Covers application, quality, requirements, samples, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3198A; 1944. Synthetic Rubber Sponge (Medium). For sheet, strip, molded shapes, or as ordered. Covers application, quality, requirements, samples, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3199A; 1944. Synthetic Rubber Sponge (Firm). For sheet, strip, molded shapes, or as ordered. Gives requirements for application, quality, requirements, samples, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3200A; 1943. Synthetic Rubber, Hydraulic Fluid (Petroleum Base) Resistant (55-65). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for seals, gaskets, and similar parts used in aircraft in contact with petroleum base hydraulic fluids. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejection.

Society of Automotive Engineers. Aeronautical Material specification 3201A; 1943. Synthetic Rubber; Dry Heat Resistant (35-45). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for packings, bushings, grommets, and seals where resistance to dry heat is of prime importance. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 3202A; 1943. Synthetic Rubber; Dry Heat Resistant (55-65). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for packings, bushings, grommets, and seals where resistance to dry heat is of prime importance. Covers quality, physical requirements, samples, tolerance, reports, identification, packing and marking, code letters, approval, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 3204A; 1943. Synthetic Rubber (Low-Temperature Resistant) (25-35). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for sleeves, fairings, grommets, and window channels. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 3205A; 1943. Synthetic Rubber; Low-Temperature Resistant (45-55). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for sleeves, fairings, grommets, and window channels. Gives quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3206A; 1943. Synthetic Rubber; E. P. Lubricant Resistant (65-75). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for seals in gear box installations where extreme pressure lubricants are used. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3207B; 1944. Synthetic Rubber; Weather Resistant-Chloroprene Type (25-35). For sheet, strip, molded shapes, or as ordered. Shall be suitable for window channels and weather seals. Covers quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3208B; 1944. Synthetic Rubber; Weather Resistant-Chloroprene Type (45-55). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for window channels, bumper pads, and weather seals and strips. Covers quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections. Similar specification, Army Air Forces 26554, type II, grade B.

Society of Automotive Engineers. Aeronautical Material Specification 3209B; 1944. Synthetic Rubber; Weather Resistant-Chloroprene Type (65-75). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for bumper pads, chafing strips, and weather seals. Covers quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections. Similar specification, Army Air Forces 26554, type II, grade D.

Society of Automotive Engineers. Aeronautical Material Specification 3211; 1942. Rubber or Synthetic Rubber Compounds; Coolant-Resistant (55-65). For sheet, strip, tubing, molded shapes, or as ordered. Gives requirements for application, quality, requirements, samples, tolerances, reports, identification, packing and marking, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3212B; 1944. Synthetic Rubber; Aromatic Fuel Resistant (55-65). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for gaskets, diaphragms, bushings, grommets, sleeves, seals, and packings. Covers quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3213A; 1943. Synthetic Rubber; Aromatic Fuel Resistant (75-85). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for gaskets, diaphragms, bushings, grommets, sleeves, seals, and packings. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3214A; 1944. Synthetic Rubber; Aromatic Fuel Resistant (35-45). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Gives requirements for application, quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3215A; 1943. Synthetic Rubber; Aromatic Fuel Resistant (65-75). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for gaskets, diaphragms, bushings, grommets, sleeves, seals, and packings. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3220; 1940. Synthetic Rubber. This compound shall be suitable for packing and sealing joints which come in contact with gasoline, hot lubricating oils, and ethylene glycol. Gives detailed requirements as to quality, methods of test, and methods of approval and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 3221A; 1944. Synthetic Rubber; Rapid Full Swelling (45-55). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Gives requirements for application, quality, requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3222A; 1944. Synthetic Rubber; Hot Oil Resistant-High Swell (45-55). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Gives requirements for application, quality, requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3223A; 1943. Synthetic Rubber; Hot Oil and Coolant Resistant-High Swell (55-65). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for seals. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code numbers, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3226A; 1943. Synthetic Rubber; Hot Oil and Coolant Resistant-Low Swell (45-55). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for oil and coolant line hose, packings, bushings, grommets, and seals. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3227A; 1943. Synthetic Rubber; Hot Oil and Coolant Resistant-Low Swell (55-65). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for oil and coolant line hose, packings, bushings, grommets, and seals. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3228A; 1943. Synthetic Rubber; Hot Oil and Coolent Resistant-Low Swell (65-75). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for packings, bushings, and grommets. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3229A; 1943. Synthetic Rubber; Hot Oil Resistant-Low Swell (75-85). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Shall be suitable for packings, bushings, and grommets. Covers quality, physical requirements, samples, tolerances, reports, identification, packing and marking, code letters, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3240; 1944. Synthetic Rubber; Weather Resistant—Chloroprene Type (35-45). For sheet, strip, tubing, extrusions, molded shapes, or as ordered. Gives requirements for application, quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections. Similar specification, Army Air Forces 26554, type II, grade A.

Society of Automotive Engineers. Aeronautical Specification 3250; 1944. Synthetic Rubber and Cork Composition; General Purpose (35-45). For sheet, strip, molded shapes, or as ordered. Gives requirements for application, quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3251; 1944. Synthetic Rubber and Cork Composition; General Purpose (45-55). For sheet, strip, molded shapes, or as ordered. Gives requirements for application, quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3252; 1944. Synthetic Rubber and Cork Composition; General Purpose (55-65). For sheet, strip, molded shapes, or as ordered. Gives requirements for application, quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

U. S. Gov., Army Air Forces. Specification 26583; 1942. Rubber; Synthetic, Molded.

U. S. Gov., Army Air Forces. Specification 26588; 1942. Rubber; Synthetic, Molded, or Extruded Aromatic Resistant.

U. S. Gov., Army Air Forces. Specification 26600; 1944. Rubber; Synthetic, Molded, Electrical Resistant.

U. S. Gov., Navy Dept. Specification 33R5; 1944. Rubber (Synthetic) and Cement for Lining Ferrous Pipe and Fittings (for Salt-Water Lines).

U. S. Gov., Navy Dept. Specification 33R6b; 1944. Rubber (Synthetic), Composition (for Covering Solid Shafts).

202. HOSE (RUBBER, COTTON, AND LINEN)

202.0 GENERAL ITEMS

American Society for Testing Materials, D 571-44T; 1944. Tentative Methods of Testing Automotive Hydraulic Brake Hose. Covers 1/8 in. assemblies of hose and end fittings as used in the automotive industry; requirements for selection of specimen, test conditions, expansion, bursting strength, fatigue life (whip test) and tensile strength tests, and description of apparatus necessary.

Rubber Manufacturers Assn., Inc. Specification Data Book, Section II. Hose. Includes—(A) glossary of hose terms and (B) hose tolerances.

Rubber Manufacturers Assn., Inc. Specification Data Book, Section III. Methods of Test. Recommends American Society for Testing Materials test methods for use in the testing of belting and hose.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); American National hose coupling and fire-hose coupling threads; and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

202.1 AIR HOSE

202.10 General Items

American Society for Testing Materials, D622-44T; 1944. Tentative Methods of Testing Automotive Air Brake and Vacuum Brake Hose. For use in testing the conventional types of hose employed for the operation of air brake and vacuum brake systems either on a single motor vehicle or as connecting or transmission lines in a combination of vehicles. General methods, sampling, test conditions, air pressure test, bursting test, aging test, tensile strength test, gasoline immersion swelling test, bend test, vacuum test, deformation test, and report.

U. S. Gov., Army Air Forces. Specification 26576C-1; 1944. Hose Assembly; High Pressure, for breathing Oxygen.

U. S. Gov., Army Air Forces. Specification 26579-C; 1945. Hose Assembly; Low Pressure (for Breathing Oxygen).

202.11 Air Brake and Signal Hose

American Transit Assn. Standard Specification for Air Brake Hose, E18-37; 1937. This specification covers the manufacture of hose, physical properties and tests, standard sizes and dimensions, workmanship and finish, marking, and inspection and rejection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Air Brake Hose Coupling, Standard. Dimensional drawing of coupling and marking.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Air Brake hose Coupling Gages for Gaging Guard Arm and Lips on Used Couplings at Hose Mounting Stations. Recommended Practice. Covers two sizes of gages with dimensional drawings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Air Brake Hose Coupling Packing Ring Gage; Standard. Dimensional drawings of gage and instructions for use.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Air Brake Hose Nipple; Standard. Shows detailed dimensional drawing of hose nipple.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Hose; Air-Brake and Train Air-Signal, M-601-38, 1938. Rubber hose with cotton duck reinforcement for train service. Requires 4-ply woven duck, rubber end caps, tension, friction and hydrostatic test, sizes, thickness of tube and cover, and labeling.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Dummy Hose Couplings. Dimensional drawings of brake pipe hose dummy coupling and signal hose dummy coupling.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Hose; Air-Brake and Train Air-Signal. Emergency Specification E-M-601-44;

1944. These emergency specifications are in accordance with the requirements of Supplementary Order R-1, latest revision, of the War Production Board, to restrict the use of rubber.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Gages for Gaging New Air Brake Hose Couplings, Standard. Covers dimensional drawings and purposes of twelve types of gages.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. SAE Standard Air Brake Hose (adopted 1942). Two types—(A) hose having synthetic oil-resisting organic material, (B) hose having a rubber tube; manufacture, hose identification, retests and rejection, sizes (5/8 to 1-3/8 outside diameters), samplex for tests, and test requirements.

U. S. Gov., Army Air Forces. Specification 40331; 1940. Coupling Assembly Air-Hose.

U. S. Gov., Navy Dept. Specification 33C4e; 1942. Couplings and Fittings; Air-Hose.

References.—Methods of testing, *see* 200; hose duck, *see* 202.0.

202.12 Pneumatic Tool Hose

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Hose; Air, Gas and Oxygen. Wrapped and Braided. Emergency Specification E-M-603-44; 1944. These emergency specifications are in accordance with the requirements of Supplementary Order R-1, latest revision, of the War Production Board, to restrict the use of rubber.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Hose; Air, Gas and Oxygen, Wrapped and Braided. Specifications M-603-41; 1941. Covers both wrapped canvas and braided air hose for use with pneumatic drills, hammers, hoists, vacuum cleaning outfits, and oxyacetylene apparatus, etc. Gives manufacture, physical properties and tests, dimensions and tolerances, workmanship and finish, marking, and inspection and rejection.

U. S. Gov., Federal Specification ZZ-H-496; 1933. Amendment 1; 1941. Hose; Pneumatic, Braided. Gives requirements for construction, tube, cover, cotton reinforcement length, couplings, and physical test requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-496, Jan. 1943 (issued by Procurement Div., Treasury Dept., U. S. Gov.). Gives requirements for permitting use of butadiene or chloroprene synthetic rubber. Covers construction, length, size, thickness, strength, and chemical requirements.

U. S. Gov., Federal Specification ZZ-H-499a; 1944. Hose; Pneumatic, Wrapped. Covers a single grade of the type known as "wrapped." Gives requirements for construction, tube and cover, fabric, couplings, physical requirements, and brands; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33H7c; 1944. Hose; Cutting and Welding (Acetylene-Hydrogen, Oxygen-Air).

U. S. Gov., Navy Dept. Specification 33H12c; 1944. Hose; Vacuum.

U. S. Gov., Navy Dept. Specification 33H25; 1944. Hose; Pneumatic (Braided or Wrapped).

U. S. Gov., U. S. Maritime Commission. Specification 33-MC-1; 1941. Hose; Pneumatic, Wrapped. There shall be but one type and grade. Hose shall consist of a rubber tube, fabric plies or layers, and a rubber cover, and shall be of the wrapped construction. Gives requirements for materials, workmanship, size, tolerances, thickness, fabric, hydrostatic test pressure, burst strength, friction, tensile strength, ultimate elongation, inspection, and method of tests.

References.—Methods of testing, *see* 200; standard sizes, hose duck, *see* 202.0.

202.13 Divers' Hose

U. S. Gov., Navy Dept. Specification 33H9b; 1945. Hose; Air, Diving-Apparatus.

References.—Methods of testing, *see* 200; standard sizes, hose duck, *see* 202.0.

202.2 CHEMICAL AND OIL HOSE

202.21 Chemical Hose

Underwriters' Laboratories, Inc. Emergency Alternate Specification for Chemical Engine Hose, Subject 92, EAS, 1944. To provide a serviceable hose that will perform according to the requirements of a fire emergency for several years while assisting in the conservation of crude rubber. Covers types and grade, sizes, material and workmanship, construction, length, couplings, strength and twist, physical requirements, color, and methods of sampling for burst, physical, and detail tests; examination, inspection, and test methods; and description of label service.

Underwriters' Laboratories, Inc. Standard for Chemical Engine Hose, Subject 92, 1939. Applies to chemical engine hose for use with chemical fire extinguishers and chemical fire engines. Gives hose in general, rubber parts, cotton reinforcements, attachment of fittings, hydrostatic pressure tests, and tests on rubber parts.

U. S. Gov., Federal Specification ZZ-H-421a; 1938. Amendment 1; 1941. Hose; Chemical. Covers one grade and two types—(A) wrapped and (B) braided. Gives requirements for construction, tube and cover, cotton reinforcements, length, couplings, hydrostatic test, and physical requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-421a; 1943, changes requirements for tube and cover compounds, branding, physical tests, and color.

U. S. Gov., Navy Dept. Specification 58H1a; 1944. Hose; Fire-Extinguisher (Portable, 15-lb., Carbon-Dioxide).

U. S. Gov., Navy Dept. Specification 33H3c; 1944. Hose; Fire-Extinguisher, Twin.

References.—Methods of testing, *see* 200; hose duck; *see* 202.0.

202.22 Oil Hose

U. S. Gov., Army Air Forces. Specification 28561; 1939. Hose; Heat Resisting, Gas and Oil (Single Ply).

U. S. Gov., Army Air Forces. Specification 26566 (2); 1940. Tubing; Extruded, Neoprene (for Oil, Fluid, and Hydraulic Lines).

U. S. Gov., Army Air Forces. Specification 26591 (1); 1944. Hose; Portable, Gasoline and Oil.

U. S. Gov., Army Air Forces. Specification 26597A; 1944. Hose; Aircraft Flame-Resistant.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-26-2; 1944. Hose; Oil and Coolant Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-ZZ-H-456a-6; 1944. Hose; Synthetic, Aromatic-Resistant.

U. S. Gov., Federal Specification ZZ-H-481b; 1939. Amendment 1, 1941. Hose; Oil-Suction and Discharge. Gives requirements for construction, cotton duck, wire reinforcement, rubber filling strip, rubber layer, cover, nipples, flanges, couplings, and physical requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-481b, Jan. 1943 (issued by Procurement Div., Treasury Dept., U. S. Gov.). Gives three types—type A, utilizing polymerized chloroprene as the basic filler; type B, utilizing a condensation product of an organic dihalide and an inorganic polysulphide as the basic filler; and type C, utilizing a copolymer product of butadiene. Covers requirements and tests for these types.

U. S. Gov., Navy Dept. Specification 33H4f; 1944. Hose; Oil-and-Gasoline-Suction-and-Discharge, Synthetic-Rubber, Wire-Stiffened.

U. S. Gov., Navy Dept. Specification 33H18a; 1944. Hose; Floater, Nonmetallic.

U. S. Gov., Navy Dept. Specification 33H20b; 1944. Hose; Oil-Gasoline-Discharge, Smooth-Bore, Light-Weight.

U. S. Gov., Navy Dept. Specification 33H21a; 1944. Hose; Oil-and-Gasoline-Suction-and-Discharge, Smooth-Bore, Light-Weight, Wire-Stiffened.

U. S. Gov., Navy Dept. Specification 33H23a; 1944. Hose; Oil-and-Gasoline-Suction-and-Discharge, Smooth-Bore, Light-Weight (Circular Woven Fabric, Wire Inserted).

References.—Methods of testing, *see* 200; standard sizes, hose duck, *see* 202.0.

202.3 GAS AND GASOLINE HOSE

202.31 Gas Hose

American Gas Assn. American Standards Assn., Z21-2-1938. Listing Requirements for Flexible Gas Tubing. Performance requirements and methods of test for leakage, capacity, strength, flexibility, resistance to heat and freezing, elasticity and gripping power of rubber slip ends, drawing of standard hose and nozzle.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Hose; Air, Gas and Oxygen, Wrapped and Braided, M-603-41; 1941. Air hose for not more than 125 lb. pressure, for operation of pneumatic tools, also hose for vacuum cleaning outfits, and gas welding apparatus. Construction details, test requirements, sizes, armoring, tolerances, and labeling.

U. S. Gov., Federal Specification ZZ-H-461a; 1933. Hose; Gas (Acetylene, Air, Hydrogen, and Oxygen). Covers the "wrapped" or "braided" type and a single grade. Gives requirements for material, construction, tube, cover, reinforcements, couplings, physical requirements, brand, and color; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-461a; 1943, changes requirements for brand, color, physical requirements, and rubber and synthetic rubber compounds.

U. S. Gov., Navy Dept. Specification 33H7c; 1944. Hose; Cutting and Welding (Acetylene-Hydrogen, Oxygen-Air).

U. S. Gov., U. S. Army Signal Corps. Specification 83-2A; 1941. Coupling ML-49, Hose Coupling for Hydrogen-Gas Cylinders.

References.—Methods of testing, *see* 200; hose duck, *see* 202.0.

202.32 Gasoline Hose

Underwriters' Laboratories, Inc. Standard for 3/4, 1, and 1 1/4 Inch Hose for Conducting Gasoline, 1937. Applies to short lengths of flexible hose in three types of fabrication; construction details as to inner rubber tube or flexible metal tube, reinforcement, cotton or rubber jacket. Bonding to dissipate static, marking, zinc coating, bending test, hydrostatic test, swelling and crushing tests, etc.

U. S. Gov., Army Air Forces. Specification 26551-G (1); 1943. Hose; Gasoline, Nonmetallic.

U. S. Gov., Army Air Forces. Specification 26561; 1939. Hose; Heat Resisting, Gas and Oil (Single Ply).

U. S. Gov., Army Air Forces. Specification 26567-C; 1943. Hose; Gasoline (Thin-Wall).

U. S. Gov., Army Air Forces. Specification 26591 (1); 1944. Hose; Portable, Gasoline and Oil.

U. S. Gov., Army Air Forces. Specification 26597A; 1944. Hose; Aircraft, Flame-Resistant.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-27; 1944. Hose; Self-Sealing, Fuel, Aromatic Resistant.

U. S. Gov., Army-Navy Aeronautical Specification AN-ZZ-H-456a—6; 1944. Hose; Synthetic, Aromatic Resistant.

U. S. Gov., Federal Specification ZZ-H-466b; 1935. Amendment 3; 1943. Hose; Gasoline, Rubber-Metal. Covers one grade. Gives requirements for construction, flexible metal tube, rubber tube, cotton jacket, resistance to gasoline, physical test requirements, couplings, brands, and lengths; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-H-471; 1940. Hose; Gasoline, Wire-Stiffened. Covers one type and grade. Gives requirements for construction, tube, cover, adhesion, resistance to gasoline, swelling, cotton jacket, wire reinforcement, couplings, coupling threads, branding, physical properties, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-471; 1943. Changes requirements for types, couplings, construction, dimensions, wire reinforcement, branding, strength, swelling, adhesion, and physical properties.

U. S. Gov., Navy Dept. Specification 33H2f; 1944. Hose; Gasoline, Nonmetallic.

U. S. Gov., Navy Dept. Specification 33H4f; 1944. Hose; Oil-and-Gasoline-Suction-and-Discharge, Synthetic-Rubber, Wire-Stiffened.

U. S. Gov., Navy Dept. Specification 33H8b; 1944. Hose; Gasoline, Synthetic Rubber (Circular Woven Fabric Wire-Inserted).

U. S. Gov., Navy Dept. Specification 33H20b; 1944. Hose; Oil-Gasoline-Discharge, Smooth-Bore, Light-Weight.

U. S. Gov., Navy Dept. Specification 33H21a; 1944. Hose; Oil-and-Gasoline-Suction-and-Discharge, Smooth-Bore, Light-Weight, Wire-Stiffened.

U. S. Gov., Navy Dept. Specification 33H23a; 1944. Hose; Oil-and-Gasoline-Suction-and-Discharge, Smooth-Bore, Light-Weight (Circular Woven Fabric, Wire-Inserted).

U. S. Gov., Navy Dept. Specification 33H31; 1944. Hose; Gasoline, Synthetic-Rubber (Wire-Stiffened).

U. S. Gov., U. S. Army, Army Air Forces. Specification 20-123; 1944. Hose; Fuel Jettison.

References.—Methods of testing, *see* 200; hose duck, *see* 202.0.

202.4 WATER HOSE, STEAM HOSE

202.40 General Items

American Society for Testing Materials, D 380-40T; 1940. Tentative Methods of Testing Rubber Hose. Included natural rubber and synthetic compounds, sampling, measurements, test conditions, tensile strength and elongation, premanent set, adhesion, hydrostatic, steam, and immersion tests for swell and deterioration of hose used for petroleum products, with other tests in accordance with A.S.T.M. methods—D 15 for preparation of sample, D 412 for tension, D 572 for aging, and D 413 for adhesion.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-28; 1944. Hose Assemblies; High-Pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-ZZ-H-626a-1; 1944. Hose Assemblies; Low-Pressure.

202.41 Fire Hose

American Hospital Assn., 22-13. Rubber-Lined Cotton Fire Hose. Covers one grade. Based on U. S. Gov. Federal Specification ZZ-H-451a for Rubber-Lined Cotton Fire Hose (referred to below), WW-C-621a for Cotton (Rubber-Lined) and Linen (Unlined) Hose Couplings, and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

American Hospital Assn., 22-16. Unlined Linen Fire Hose. Covers one type and one grade. Based on U. S. Gov. Federal Specifications JJ-H-571 for Unlined Linen Fire Hose (referred to below) and WW-C-621a for Cotton (Rubber-Lined) and Linen (Unlined) Hose Couplings.

American Society for Testing Materials, D 296-38; 1938. American Standards Assn., L3.1-1941. Cotton Rubber-Lined Fire Hose for Public and Private Fire Department Use. Includes 1 1/2 to 3 1/2-in. single, double, or triple jacketed hose, quality of seamless cotton fabric, rubber-lining thicknesses, chemical composition, tensile properties and life test requirements; friction, hydrostatic, kink, and bursting strength tests; sizes, flexibility, and workmanship.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Care of Fire Hose. Suggestions for the selection, maintenance, and use of fire hose. Covers cotton rubber-lined hose, linen hose for use in buildings, rubber hose, use of hose for other than fire purposes, rack for washing and drying hose, and care of nozzles, couplings, etc.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Cotton Rubber-Lined Fire Hose. Standard specifications for cotton rubber-lined fire hose for public and private fire department use. Covers sizes, cotton fabric, rubber lining, chemical composition, tensile properties at 60 days, tensile properties at one year, life test, friction test, hydrostatic pressure tests, bursting strength tests, kink tests, place of hydrostatic tests, diameter, length, flexibility, workmanship, marking, sampling, and methods of testing.

Underwriters' Laboratories, Inc. Emergency Alternate Specification for Cotton, Rubber-Lined Fire Hose, Subject 19, EAS, 1942. Applies to the trade sizes of 1 1/2, 2 1/2, 3, and 3 1/2-in. single or double-jacketed cotton, rubber-lined fire hose for use in public or private fire departments. Single-jacketed for use at hydrants, standpipes, and similar places, double-jacketed for use on pumping engines and in places where service conditions require the additional protection against wear. Gives manufacture, hydrostatic pressure tests, diameter and length, physical properties and tests, accelerated aging tests, and inspection and test procedure.

Underwriters' Laboratories, Inc. Standard for Cotton Rubber-Lined Fire Hose for Public and Private Department Use, Subject 19; 1941. Applies to the standard sizes of 1 1/2, 2, 2 1/2, 3, and 3 1/2-in. single, double, or triple-jacketed cotton, rubber-lined fire hose for use in public or private fire departments. Gives manufacture, hydrostatic pressure tests, physical properties and tests, and chemical tests for cotton-jacketed rubber-lined fire hose; physical tests for rubber-covered cotton-jacketed rubber-lined fire hose; tests of rubber parts; and factory inspection and tests.

Underwriters' Laboratories, Inc. Standard for Unlined Fire Hose (Flax Line), 1930. Covers hose without rubber lining for use inside of buildings, grade of flax fibers, quality of yarn, chemical and physical tests, markings, standard hose sizes, diagrams of test equipment.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-182-1. Hose; 1 1/2-in., CJRL.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-182-2. Hose; 1-in., CJRL.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-183. Hose; 1 1/2-in., linen.

U. S. Gov., Federal Specification JJ-H-571; 1933. Hose; Fire, Linen, Unlined. Covers one type and one grade. Gives requirements for flax, fabric, interior of hose, diameter, construction, yarn, tests, length, branding, identification, and couplings; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-JJ-H-571; 1942, (issued by Procurement Div., Treasure Dept., U. S. Gov.) changes requirements to comply with Underwriters' Laboratories Standard and Emergency Alternate Specification for Unlined Fire Hose and requires Underwriters' label.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes requirements for fire-hose rack and hose. Covers malleable iron, steel, or brass rack suitable for hanging 1 1/2-in. diameter linen hose in vertical loops on pins or supports. Requirements given for valves, hose, and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for metals and finishes, standard materials, and illustrations, selections, and air gaps.

U. S. Gov., Federal Specification ZZ-H-451a; 1941. Amendment 2; 1944. Hose; Fire, Cotton, Rubber-Lined. For rubber and/or synthetic rubber lining. Gives requirements for construction, rubber and/or synthetic rubber lining, cotton jacket, couplings, finished hose, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33H16; 1940. Hose; Fire, Cotton, Linen-lined, 2 1/2-in.

References.—Methods of testing, *see* 200; standard sizes, *see* 202.0; fire hose fittings, *see* 974.2; chemical fire hose, *see* 202.21; hose duck, *see* 202.0.

202.42 Garden and Ordinary Cold Water Hose

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Emergency Specification E-M-604-44. Hose; Cold Water, Wrapped and Braided. These emergency specifications are in accordance with the requirements of Supplementary Order R-1, latest revision, of the War Production Board, to restrict the use of rubber.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Hose; Cold Water, Wrapped and Braided. Specifications M-604-38; 1938. For both wrapped canvas and braided fabric hose. Gives manufacture, physical properties and tests, dimensions and tolerances, workmanship and finish, marking, and inspection and rejection.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C327; 1927. Selection and Care of Garden Hose. Describes manufacture of three types—wrapped, braided, and cotton rubber lined—with simple methods of inspection and making kink test.

U. S. Gov., Federal Specification ZZ-H-521; 1931. Amendment 3; 1941. Hose; Spray. Covers the "wrapped" type and a single grade. Gives requirements for construction, tube, cover, cotton duck, couplings, and physical test requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-521; Feb. 1943 (issued by Procurement Div., Treasury Dept., U. S. Gov.). Alternate for Federal Specification ZZ-H-521. Changes include elimination of use of new rubber, physical requirements, tensile strength, elongation, and cotton fabric.

U. S. Gov., Federal Specification ZZ-H-601; 1931. Hose; Water, Braided. Covers the "braided" type and a single grade. Gives requirements for construction, tube, cover, cotton reenforcement, length, couplings, and physical test requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-601; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for materials, construction, physical tests, and chemical composition.

U. S. Gov., Federal Specification ZZ-H-611: 1930. Amendment 3; 1941. Hose; Water, Wrapped. Covers water and wash-deck hose of a single grade and type. Gives requirements for construction, tube, cover, cotton duck, couplings, and physical test requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-611; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for construction, physical tests, and chemical requirements.

U. S. Gov., Navy Dept. Specification 33H27; 1944. Hose; Water, Wrapped and Braided.

References.—Methods of testing, *see* 200; standard sizes, *see* 202.0; tender and tank hose, *see* 202.45; suction hose, *see* 202.46; hose duck, *see* 202.0.

202.43 Radiator Hose

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. SAE Standard Coolant System Hoses, Adopted 1944. Intended as a guide in the selection of suitable materials for use in military types of vehicles and are divided into two types; namely, for severe, heavy duty service such as combat vehicles, and for non-combat vehicles. Gives scope, construction, physical tests, and physical test procedures for each type.

U. S. Gov., Army Air Forces. Specification 26566 (2); 1940. Tubing; Extruded, Neoprene (for Oil, Fluid, and Hydraulic Lines).

U. S. Gov., Army-Navy Aeronautical Specification AN-H-26-2; 1944. Hose; Oil and Coolant Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-ZZ-H-456a-6; 1944. Hose; Synthetic, Aromatic Resistant.

U. S. Gov., Federal Specification ZZ-H-511; 1938. Hose; Radiator (for) Motor Vehicles. Covers the "wrapped" type and a single grade. Gives requirements for construction, tube, cover, cotton duck, boiling test, and physical test requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-511; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for materials, sizes, physical characteristics, and chemical compositions.

U. S. Gov., U. S. Army, Army Air Forces. Specification 20-35; 1926. Hose; Radiator, Wire-Reinforced Type.

202.44 Steam and Hot Water Hose

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Emergency Specification E-M-605-44. Hose; Steam and Hot Water. These emergency specifications are in accordance with the requirements of Supplementary Order R-1, latest revision, of the War Production Board, to restrict the use of rubber.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Hose; Steam and Hot Water. Specification M-605-38; 1938. Covers hose for conveying steam or hot water. Gives requirements for manufacture, physical properties and tests, dimensions and tolerances, workmanship and finish, marking, and inspection and rejection.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes recommendation for size of steam hose for use on spotting board in spotting department.

U. S. Gov., Federal Specification ZZ-H-541; 1931. Amendment 3; 1944. Hose; Steam. Covers the "wrapped" type and a single grade. Gives requirements for construction, tube, cover, cotton duck, couplings, physical requirements, and brands; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing, *see* 200; standard sizes, *see* 202.0; radiator hose, *see* 202.43; hose duck, *see* 202.0; general requirements for metals, *see* 600.1.

202.45 Tender and Tank Hose

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1944. Emergency Specification E-M-606-44. Hose; Tender Tank. These emergency specifications are in accordance with the requirements of Supplementary Order R-1, latest revision, of the War Production Board, to restrict the use of rubber.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual Standard and Recommended Practice, 1944. Hose; Tender Tank. Specification M-606-38; 1938. Covers non-collapsible corrugated suction hose for water connection between locomotives and tender tanks. Gives manufacture, physical properties and tests, dimensions and tolerances, workmanship and finish, marking, and inspection and rejection.

U. S. Gov., Federal Specification ZZ-H-581; 1934. Hose; Tender, Corrugated, Locomotive. Covers one type and one grade. Gives requirements for construction, tube, cover, layer, cotton duck, wire reinforcement, brand, dimensions, and physical requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-581; 1943, changes requirements for construction, physical rubber layer, cotton duck, dimensions, physical requirements, and sampling.

References.—Methods of testing, *see* 200; hose duck, *see* 202.0.

202.46 Suction Hose

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 332. Strainer; Suction Hose.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-184. Hose; Suction.

U. S. Gov., Federal Specification ZZ-H-561b; 1939. Amendment 2; 1944. Hose; Suction, Water, Smooth-Bore. Covers one grade; two types—(I) wrapped fabric construction and (II) woven wire filler construction; and four classes utilizing various synthetic compounds. Gives requirements for construction, tube and cover, cotton duck, wire reinforcements, rubber filling strip, soft ends, couplings, nipples, clamps, flanges, strainers, physical requirements, compounds, brands, and vacuum test; methods of sampling, inspection, and tests; requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33H5d; 1944. Hose; Suction, Water, Smooth-Bore.

U. S. Gov., Navy Dept. Specification 33H21a; 1944. Hose; Oil-and-Gasoline-Suction-and-Discharge, Smooth-Bore, Light-Weight, Wire-Stiffened.

U. S. Gov., Navy Dept. Specification 33H23a; 1944. Hose; Oil-and-Gasoline-Suction-and-Discharge, Smooth-Bore, Light-Weight (Circular Woven Fabric, Wire-Inserted).

References.—Oil suction hose, *see* 202.22; standard sizes, *see* 202.0; methods of testing rubber goods, *see* 200; hose duck, *see* 202.0.

202.5 METALLIC HOSE

References.—Flexible metallic hose, *see* 607.7.

202.9 MISCELLANEOUS SPECIFICATIONS FOR HOSE

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. SAE Standard Assembly Specification for 1/8-Inch Hydraulic Brake Hose (adopted 1942). Scope, manufacture, end connections, hose identification, retests and rejection, samples for test, and test requirements.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. SAE Standard Vacuum Brake Hose (adopted 1942). Scope, manufacture, hose identification, retests and rejection, sizes (23/32 to 1 5/8 outside diameters), samples for test, and test requirements.

U. S. Gov., Army Air Forces. Specification 26601; 1944. Hose; Inflatable Shoe Ice-Elimination System.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-6a-1; 1943. Hose; Three Braided Hydraulic.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-24a; 1944. Hose; Medium High-Pressure Hydraulic.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-185. Hose; High-Pressure, 3/4-Inch, Rubber.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-186-1. Hose; Back Pack Pump, 3/8-Inch, Rubber.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-186-2. Hose; Back Pack Pump, 1/2-Inch, Rubber.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-186-3. Hose; Back Pack Pump, Wire-Insert.

U. S. Gov., Navy Dept. Specification 33F4a; 1941. Fittings; Hose, Salvage, Air 1 1/4-Inch.

U. S. Gov., Navy Dept. Specification 33H11b; 1941. Hose; Ships' Sewage Disposal, Rubber.

U. S. Gov., Navy Dept. Specification 33H14; 1944. Hose; Rubber (Synthetic), Wire-Reinforced (for Submarine Rescue Chamber).

U. S. Gov., Navy Dept. Specification 33H19b; 1944. Hose; Paint-or-Dope-Spray.

U. S. Gov., Navy Dept. Specification 33H26; 1944. Hose; Smooth-Bore (Electrically Heated) (for Plastic Paint).

U. S. Gov., Navy Dept. Specification 33H29a; 1945. Hose; Fuel, Armored.

U. S. Gov., Navy Dept. Specification 34F3c; 1936. Fittings; Hose (Water, Steam, and Oil) (Other Than Flexible Metallic).

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Clamps; Hose.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Nozzles; Hose.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-31C; 1942. Hose; Gas Mask, 27-inch.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-31D; 1941. Hose; M1, Gas Mask.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-106; 1941. Hose; Elbow.

U. S. Gov., U. S. Maritime Commission. Specification 33-MC-2; 1942. Couplings and Clamps; Pneumatic Hose. There shall be but one grade and there are seven types. Gives requirements for sizes, materials, workmanship, details, sampling, inspection, method of test, and drawings.

References.—Methods of testing, *see* 200; hose duck, *see* 202.0; dredging sleeves, *see* 209.1.

203. RUBBER FOOTWEAR, GLOVES, AND CLOTHING

U. S. Gov., Federal Specification BBB-C-606; 1941. Coats and Trousers; Rubber-Coated (Foul-Weather Clothing). Covers two types: (I) Coats (four classes)—(A) short (jackets), (B) three-quarter length, (C) workman's, and (D) police, standard weight; and (II) trousers and overalls. Gives detail requirements; sizes; and methods of sampling, inspection, and tests. Emergency Alternate Federal Specification E-BBB-C-606; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes title to read "Coats and Trousers; Rubber or Synthetic Resin-Coated (Foul-Weather Clothing)" and eliminates the use of new rubber or latex.

203.1 RUBBER BOOTS, SHOES, AND HEELS

203.11 Rubber Boots

U. S. Gov., Federal Specification ZZ-B-551a; 1936. Boots; Rubber, Hip. Covers one grade. Gives requirements for chemical composition, tensile strength, ultimate elongation, resistance to abrasion, lasts, and measurements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-B-551A; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for the rubber compounds, lasts, and measurements.

U. S. Gov., Federal Specification ZZ-B-556; 1936. Amendment 1; 1942. Boots; Rubber, Short, Heavy. Covers one grade. Gives chemical requirements, tensile strength, ultimate elongation, resistance to abrasion, lasts, measurements, leg form, vamp form, and workmanship; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-B-556A; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for rubber compounds, resistance to abrasions, girth, leg form, vamp form, and workmanship.

U. S. Gov., Federal Specification ZZ-B-561; 1933. Boots; Rubber, Short, Light. Covers one grade. Gives chemical requirements, tensile strength, ultimate elongation, resistance to abrasion, lasts, measurements, leg form, counter form, and stiffening counter; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing rubber goods, *see* 200.

203.12 Rubber Shoes

U. S. Gov., Federal Specification ZZ-O-841; 1935. Amendment 3; 1944. Overshoes; Rubber. Covers a single grade of the type known as "storm rubbers"; black, lightweight, and made to fit without fastening. Gives requirements for synthetic and natural rubber, uppers, insole, outsole and heel, binder sole, counter and heel piece, friction or gum toe cap, gum bind, sizes, weight, height at back, weight, finish, foxing strip, and maximum crude rubber content; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 72A2b; 1942. Arctics; Cashmerette, Four-Buckle.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3118; 1941. Shoes; Pilot's Type A-9.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 20-6A; 1931. Overshoe; Arctic, Cloth Top.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 20-112; 1940. Overshoe; Arctic, Army Nurses'.

References.—Leather shoes, *see* 067.1.

203.13 Rubber Heels

U. S. Gov., Federal Specification ZZ-H-141; 1934. Heels; Rubber. Covers one grade. Gives requirements for color, shape, size, thickness, nail holes, hardness, resistance to abrasion, and accelerated aging test; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-H-141; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) covers four grades in lieu of one—HC, HD, HE, and HL and gives physical, chemical, and other requirements for same.

203.2 RUBBER GLOVES

American Society for Testing Materials, D120-40; 1940. American Standards Assn., C59.12-1942. Electrical Gloves (Voltage Rating of Gloves, 3000 Volts). For gloves without external protection, and with leather or other protection. Covers manufacture, voltage and leakage tests, tensile strength, elongation, and set tests before and after aging, size, length and thickness of material, and test apparatus.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-69; 1937. Rubber Gloves for Employes of the Communication Plant. Includes gloves both with and without external protection of horsehide leather or other material, gauntlet type, in three sizes. Requirements as to quality, dimensions, high voltage, tensile, leakage, tests in accordance with procedure of the American Society for Testing Materials method D-15.

U. S. Gov., Federal Specification ZZ-G-401; 1934. Gloves; Rubber (for) Electrical Workers (for Use in Connection With Apparatus or Circuits Not Exceeding

3,000 Volts to Ground). Covers the reversible seamless type, one grade, and two classes—(A) gloves intended for use without external protection and (B) gloves intended for use with external protection of leather or other material. Gives requirements for design, size, length, thickness, tensile strength, and ultimate elongation; accelerated aging, voltage, and leakage tests; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 37G2c; 1941. Gloves; Rubber (Natural and Synthetic).

U. S. Gov., Navy Dept. Specification 37G3a; 1941. Gloves; Rubber, Electrical Workers' (for use in connection with apparatus or circuits not exceeding 3,000 volts to ground).

U. S. Gov., Navy Dept. Specification 37G14a; 1944. Gloves; Canton-Flannel, Latex-Covered.

U. S. Gov., Treasury Dept., Procurement Div., 323A; 1942. Gloves; Rubber, Acid. Shall be on one type and grade, seamless, and with extra-long gauntlets; shaped to conform to hand, with fingers properly proportioned and shall be made entirely of rubber compound without friction or backing or any kind. Gives dimensions, chemical requirements, physical requirements and marking of gloves; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Surgeon's rubber gloves, *see* 204.52; methods of testing, *see* 200.

203.3 RUBBER HATS

References.—Cloth hats, *see* 395.2.

203.4 RAINCOAT

U. S. Gov., Marine Corps Specification, revised 1944. Coat; Rain, Synthetic Resin Filler.

References.—Waterproof clothing, *see* 392.5; cotton fabrics for rubber coating, *see* 304.71.

203.5 RUBBER APRON

U. S. Gov., U. S. Army, Signal Corps. Specification 20-94A; 1933. Apron; Type MC-111, Rubber, for storage Battery Room.

References.—Surgeon's aprons, *see* 204.51; cotton aprons, *see* 311.92.

203.9 MISCELLANEOUS RUBBER WEARING APPAREL

U. S. Gov., Federal Specification ZZ-P-41; 1937. Pads; Finger, Rubber, (for) Office Use. Covers a single grade and two types—(I) perforated and (II) without perforations. Gives requirements for design, dimensions, accelerated aging test, tensile strength, and ultimate elongation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-P-41; 1942, requires pads to be made entirely of reclaimed rubber and changes physical tests.

204. DRUGGISTS' RUBBER SUNDRIES

204.1 BANDAGES AND PLASTERS

204.11 Rubber Bandages

American Hospital Assn., 61-4. Rubber Bandages. Covers one type. Based on U. S. Gov. Federal Specification ZZ-B-101, and Errata 3, for Rubber Bandages, referred to below.

U. S. Gov., Federal Specification ZZ-B-101; 1931. Amendment 1; 1944. Bandages; Rubber and Synthetic Rubber. Gives requirements for dimensions, reinforcing strip, tying tapes, synthetical rubber, tensile strength; ultimate elongation, accelerated aging tests, and sterilization; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, *see* 200. Other surgical dressings, *see* 398.

204.12 Plasters

American Hospital Assn., 13-19. Surgical Adhesive Plaster. Covers one grade. Based on U. S. Gov. Federal Specifications U-P-401 for Surgical Adhesive Plaster (referred to below) and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles, and U. S. Gov., Dept. of Commerce, National Bureau of Standards Simplified Practice Recommendation R85-37 for Adhesive Plaster.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Adhesive Plaster (Adhesive Tape). Description, dimensions, tensile strength, adhesive strength, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sterile Adhesive Plaster (Sterile Adhesive Tape). Description, sterility, other requirements, and storage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 85-43; 1943. Adhesive Plaster. This recommendation establishes a schecule of stock widths and lengths of adhesive plaster on spools and in rolls.

U. S. Gov., Federal Specification U-P-401a; 1944. Plaster; Adhesive, Surgical. Covers one grade in two types—(I) standard base fabric, nonwater-repellent, and (II) water-repellent base fabric. Gives requirements for material and workmanship, continuous lengths, dimensions in rolls on spools and 12 in. rolls on cores, tolerance, backing, facing, adhesive quality, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 53T7; 1941. Tape; Cellulose, Adhesive-back.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 6-50B; 1932. Fabric; Adhesive.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-81C; 1943. Tape; Adhesive, Colored and White.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-104A; 1941. Plaster; Adhesive, Non-Surgical.

References.—*See* references under 204.11.

204.13 Tourniquets

American Hospital Assn., 10-67. Tubular Rubber Tourniquets. Covers one type and one grade. Based on U. S. Gov. Federal Specifications ZZ-T-606.

U. S. Gov., Federal Specification ZZ-T-606; 1934. Amendment 1; 1944. Tourniquets; Rubber, Tubular. Covers one type and grade. Gives requirements for natural rubber and synthetic rubber, design, dimensions, tensile strength, ultimate elongation, and accelerated aging test; methods of sampling,

inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Department. Specification 10-2830A; 1942. Tourniquet; Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2857A; 1941. Tourniquet; Esmarch.

204.2 BAGS, BOTTLES, AND CUSHIONS OF RUBBER

204.21 Bags, Ice

American Hospital Assn., 70-16. Helmet-Shaped Ice-Bags. Covers one type. Based on U. S. Gov. Federal Specifications ZZ-I-111 and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; and ZZ-S-311a for Rubber Sheeting.

American Hospital Assn., 70-19. Rubber Ice-Bags. Covers one type. Based on U. S. Gov. Federal Specifications ZZ-I-121 and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

U. S. Gov., Federal Specification ZZ-I-111; 1930. Amendment 1; 1944. Ice-Bags; Helmet-Shaped. Covers a single type, made from a cotton fabric coated on both sides with a synthetic rubber compound or a suitable compound of natural rubber and synthetic rubber. Gives requirements for synthetic rubber, design, fittings, and branding; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-I-121; 1939. Amendment 1; 1944. Ice-Bags; Rubber. Covers a single type, made of rubber, walls reinforced at seams and throat. Gives requirements for material and workmanship, shape, construction, dimensions, thickness, rubber content, tensile strength, ultimate elongation, resistance to hot air, pressure test, branding, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4; rubber sheeting, *see* 204.33.

204.22 Bags, Obstetrical

204.23 Bags and Bottles, Water

American Hospital Assn., 61-10. Cloth-Inserted Hot-Water Bottles. Covers oblong shape with rounded corners. Based on U. S. Gov. Federal Specifications ZZ-B-581 for Cloth-Inserted Hot-Water Bottles (referred to below), ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods, CCC-T-191a for General Specifications Test Methods Textiles, and ZZ-S-311a for Rubber Sheeting.

American Hospital Assn., 61-13. Rubber Hot-Water Bottles. Covers 2 types. Based on U. S. Gov. Federal Specifications ZZ-B-586a for Rubber Hot-Water Bottles (referred to below) and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-33. Bag; Rubber-Insert.

U. S. Gov., Federal Specification ZZ-B-581a; 1944. Bottles; Hot Water, Cloth-Inserted. Covers the oblong shape with rounded corners in 2 qt. and 3 qt. capacities and two types—(B) synthetic rubber coated and (C) synthetic resin coated; made of double-coated rubber sheeting reinforced at seams or edges and throat. Gives requirements for material, workmanship, thickness, synthetic rubber, synthetic resin coating, rubber, sheeting, pressure test, resistance to hot water, fittings, and branding; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification ZZ-B-586a; 1935. Amendment 1; 1944. Bottles; Hot-Water, Rubber. Covers two types—(A) threaded stopper and (B) stopperless. Gives requirements for material, shape, capacity, thickness, color, branding, design, tensile strength, ultimate elongation, and resistance to inspection; methods of sampling, inspection and tests; and packaging, packing, and marking.

References.—Methods of testing rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4; rubber sheeting, *see* 204.33.

204.24 Rubber Basin

U. S. Gov., Navy Dept. Specification 57B19; 1941. Basins; Hand, Rubber.

204.25 Rubber Cushions and Pillows

American Hospital Assn., 1-34. Rubber Pillow Cases. Covers a single type and a single grade. Based on U. S. Gov. Federal Specifications ZZ-P-361 for Rubber Pillowcases (referred to below), ZZ-R-601a for Rubber Goods; General Specifications, Methods of Physical Tests and Chemical Analysis, ZZ-S-311a for Rubber Sheeting, and CCC-T-191a for Textiles; General Specifications, Test Methods.

American Hospital Assn., 49-10. Sponge-Rubber Chair Cushions. Based on U. S. Gov. Federal Specification ZZ-C-766 for Sponge-Rubber Chair Cushions (referred to below), ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods, and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 70-7. Cloth-Inserted Ring Cushions. Covers one type. Based on U. S. Gov. Federal Specifications ZZ-C-791 and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods; CCC-T-191a for General Specifications, Test Methods, Textiles; and ZZ-S-311a for Rubber Sheeting.

American Hospital Assn., 70-10. Rubber Ring Cushions. Covers one type and one grade. Based on U. S. Gov. Federal Specifications ZZ-C-796.

U. S. Gov., Federal Specification ZZ-C-766; 1940. Cushions; Chair, Sponge-Rubber. Covers three types—(I) molded form, with molded angular or cylindrical cavities, covered with fabric; (II) covered with fabric (without cavities); and (III) covered by felt or rattan on one side. Gives requirements for fabric, compressibility, and density of rubber; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-C-766; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substitutes one type in two grades—(A) all wool and (B) wool and cotton mixture; and gives requirements for same.

U. S. Gov., Federal Specification ZZ-C-791; 1930. Amendment 1; 1944. Cushions; Ring, Cloth-Inserted.

Covers one type. Gives requirements for material, design, dimensions, thickness of wall, finished sheeting, inflation, and branding; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-C-796; 1930. Amendment 1; 1944. Cushions; Ring, Rubber Synthetic. Covers one type and grade. Gives requirements for material and workmanship, design, dimensions, thickness of wall, synthetic rubber, tensile strength, ultimate elongation, resistance to hot air, inflation, and branding; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-C-811; 1938. Cushion (Underlay); Carpet and Rug, Sponge-Rubber. Covers one grade, in either strip form or of definite dimensions; and two types—(I) without woven fabric cover or insert and (II) with woven fabric cover or insert. Gives requirements for dimensions, thickness, width, length, weight, compressibility, and aging; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-C-811; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for materials.

U. S. Gov., Federal Specification ZZ-P-351; 1933. Amendment 1; 1944. Pillows; Air, Rubber. Covers one type, rectangular in shape, with one or more partitions in the air space; made of cotton sheeting coated on one side with natural rubber, or synthetic rubber, or a mixture of natural and synthetic rubber. Gives requirements for design, valve, finished sheeting, and inflation; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-P-361; 1933. Amendment 1; 1944. Pillowcases; Rubber. Covers single types and grade made from single-coated rubber sheeting. Coating shall be natural rubber, or synthetic rubber, or a mixture of natural rubber and synthetic rubber. Gives requirements for design, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4; rubber sheeting, *see* 204.33.

204.26 Fountain Syringes

American Hospital Assn., 10-49. Cloth-Inserted Fountain Syringes. Covers the rapid-flow type. Based on U. S. Gov. Federal Specifications ZZ-S-901 for Cloth-Inserted Fountain Syringes, ZZ-R-601a for Methods of Physical Tests and Chemical Analysis of Rubber Goods; CCC-T-191a for General Test Methods for Textiles, and ZZ-S-311a for Rubber Sheeting.

American Hospital Assn., 10-52. Rubber Fountain Syringes. Covers the rapid-flow type. Based on U. S. Gov. Federal Specification ZZ-S-916.

U. S. Gov., Federal Specification ZZ-S-901; 1930. Amendment 1; 1944. Syringes; Fountain, Cloth-Inserted. Covers the rapid flow type made with double-coated maroon sheeting, reinforced at seams and edges. Gives requirements for capacity, suspension tab, accessories, branding, finished sheeting, resistance to hot water, tubing, rubber content, tensile strength, and resistance to hot air; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-S-916; 1930. Amendment 1; 1944. Syringes; Fountain, Rubber. Covers the rapid flow type made with synthetic rubber or a suitable mixture of natural rubber and synthetic rubber walls reinforced at seams and edges. Gives requirements for capacity, thickness of wall, suspension tab, accessories, tensile strength, ultimate elongation, and physical properties; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 57S21; 1941. Syringes; Bulb, Rubber (self-injecting, continuous-flow, complete with one hard rubber rectal tube).

References.—Methods of testing rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4; rubber sheeting, *see* 204.33; syringes and needles, *see* 915.27.

204.27 Politzer Bags

U. S. Gov., Federal Specification ZZ-B-71b; 1944. Bags; Politzer. Covers two types—(I) valveless and (II) valve; and two classes—(A) rubber or synthetic rubber bag and tubing and (B) chloroprene polymer type bag and tubing. Gives requirements for material and workmanship, design, dimensions, tensile strength, ultimate elongation, resistance to hot air, branding, and valve; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of testing rubber goods, *see* 200.

204.29 Miscellaneous Bags

U. S. Gov., Navy Dept. Specification 57B21; 1941. Bags; Kidney-Compression, Rubber.

204.3 BLANKETS, CLOTH, AND SHEETING

204.31 Rubber Blankets

American Hospital Assn., 61-7. Rubber Blankets. Covers one grade, two types, and two classes in each type. Based on U. S. Gov. Federal Specifications ZZ-B-426 for Rubber Blankets (referred to below), ZZ-S-311a for Rubber Sheeting, ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods, and CCC-T-191a for General Specifications Test Methods Textiles.

U. S. Gov., Federal Specification ZZ-B-426; 1939. Blankets; Rubber. Covers one grade and two types—(I) seamless and (II) one middle longitudinal seam, single coated and double coated. Gives requirements for color, rubber content, mechanical properties, stock, and size; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-B-426; 1943, substitutes synthetic resin for rubber and suitable material for aluminum grommets.

204.32 Rubber Cloth

References.—Rubber sheeting, *see* 204.33.

204.33 Rubber Sheeting

American Hospital Assn., 61-172. Rubber Sheeting. Covers two types in two grades each type. Based on U. S. Gov. Federal Specifications ZZ-S-311a for Rubber

Sheeting (referred to below), ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods, and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS38-32; 1932. Hospital Rubber Sheeting. This standard covers types and colors, material and workmanship, general and detailed requirements for hospital rubber sheeting. It includes also methods of sampling, inspection, and tests. Initiated by the American Hospital Assn. and the Rubber Manufacturers Assn.

U. S. Gov., Federal Specification ZZ-S-311a; 1939. Amendment 1; 1944. Sheeting; Rubber. Covers two grades—(B) standard grade rubber and/or synthetic rubber coated and (C) synthetic resin coated; and shall be double-coated. Gives requirements for material and workmanship, synthetic rubber, synthetic resin, construction, dimensions, mechanical properties, rubber, accelerated aging, sterilization in steam, resistance to phenol, resistance to alcohol, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of testing rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4.

204.4 DENTAL RUBBER GOODS

American Dental Assn. Specification No. 10; 1940. Denture Rubber. Technical requirements are similar to those of U. S. Gov. Federal Specification ZZ-R-696, Rubber; Denture.

American Hospital Assn., 61-22. Rubber Dams. Covers one grade. Based on U. S. Gov. Federal Specifications ZZ-D-51 for Rubber Dams (referred to below) and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practive Recommendation R138-32; 1932. Dental Rubber (Base and Veneering). This recommendation establishes a simplified schedule of colors and packaging of dental rubber. Initiated by the American Dental Trade Assn.

U. S. Gov., Federal Specification ZZ-D-51; 1931. Amendment 2; 1944. Dams; Rubber. Covers one grade. Gives requirements for natural rubber and synthetic rubber, workmanship, thickness, width, length, tensile strength, ultimate elongation, accelerated aging test, and sterilization test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-R-696; 1940. Amendment 1; 1940. Rubber; Denture. Covers three types, one grade and class—(I) base rubber, (II) general purpose rubber, and (III) veneer rubber. Gives requirements for adhesion to mold, size, satisfactory working qualities, unvulcanized compound, plasticity, instructions for vulcanization, color, and porosity; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, *see* 200; other dental goods, *see* 915.1.

204.5 SURGEONS' GOODS

204.51 Rubber Aprons

American Hospital Assn., 61-1. Surgeons' Rubber Aprons. Covers two types. Based on U. S. Gov. Federal Specifications ZZ-A-611 for Surgeons' Rubber Aprons (referred to below), ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods, CCC-T-191a for General Specifications Test Methods Textiles, and ZZ-S-311a for Rubber Sheeting.

U. S. Gov., Federal Specification ZZ-A-611a; 1944. Aprons; Surgeons' (Synthetic Rubber and Resin-Coated). Covers cotton fabric aprons coated on one or both sides with synthetic rubber or synthetic resin in three types—(I) single coated (synthetic rubber), (II) double coated (synthetic rubber), and (III) double coated (synthetic resin). Gives requirements for construction, marking, physical requirements, synthetic rubber, synthetic resin, accelerated aging, sterilization in steam, resistance to phenol, resistance to mineral oil, and resistance to alcohol; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-X-166a; 1942. Aprons; X-Ray, Protective, Lead-Impregnated Rubber.

References.—Methods of testing rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4; rubber sheeting, *see* 204.33; cotton fabrics for rubber coating, *see* 304.71.

204.52 Rubber Gloves and Finger Cots

American Hospital Assn., 61-19. Rubber Finger Cots. Covers one grade. Based on U. S. Gov. Federal Specification ZZ-C-571 for Rubber Finger Cots (referred to below) and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

American Hospital Assn., 61-25. Rubber Autopsy Gloves. Covers one type, one grade, and one size. Based on U. S. Army Specifications 10-2654 for Rubber Autopsy Gloves (referred to below) and 100-2D for Marking Shipments and U. S. Gov. Federal Specification ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

American Hospital Assn., 61-28. Surgeons' Rubber Gloves. Covers 2 grades. Based on U. S. Gov. Federal Specifications ZZ-G-421a for Surgeons' Rubber Gloves (referred to below) and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS40-32; 1932. Surgeons' Rubber Gloves. This standard covers minimum requirements for material and workmanship of surgeons' rubber gloves, It gives measurements and weights for eight sizes of gloves. Method of marking gloves, with the name or trade-name of the manufacturer or supplier, is also indicated. Initiated by the American Hospital Assn. and the Rubber Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS41-32; 1932. Surgeons' Latex Gloves. This standard covers minimum requirements for material and workmanship of surgeons' latex gloves. It gives measurements and weights for eight sizes of gloves. Method of marking gloves, with the name or trade-name of the manufacturer or supplier, is also indicated. Initiated by the American Hospital Assn. and the Rubber Manufacturers Assn.

U. S. Gov., Federal Specification ZZ-C-571; 1931. Cots; Finger, Rubber. Covers a single grade. Gives requirements for dimensions, weight, rubber content, tensile strength, ultimate elongation, and accelerated aging and sterilization tests; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-G-421a; 1940. Amendment 2; 1944. Gloves; Rubber, Surgeons. Covers two grades—(A) intended for use when minimum weight, maximum strength, and best aging quality are required, and (B) intended for use when the requirements for a grade A glove are not essential. Gives material and workmanship, rolled edge, trade mark, physical requirements, acceleraged aging requirements, sterilization requirements, dimensions, weight, and thickness; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2654; 1939. Glove; Autopsy, Rubber.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2685; 1939. Gloves; Rubber, Gauntlet, Cloth-Lined, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2902; 1939. Pouch for Gloves; Rubber.

References.—Other rubber gloves, *see* 203.2; methods of testing rubber goods, *see* 200.

204.53 Rubber Pads

American Hospital Assn., 52-7. Kelly Surgical-Operating Pads. Covers one grade reversible type. Based on U. S. Gov. Federal Specifications ZZ-P-51 for Surgical-Operating Pads (referred to below; ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods; ZZ-S-311a for Rubber Sheeting; ZZ-T-831b for Rubber Tubing; CCC-T-191a for General Specifications, Test Methods, Textiles; and KK-L-291 for Upholstery Leather.

American Hospital Assn., 52-10. Operating and Examining Table Pad. Covers 2 types. Based on U. S. Gov., War Dept., Specification 10-2606 for Operating and Examining Table Pad (referred to below); U. S. Gov. Federal Specifications V-T-276b for Cotton Thread; ZZ-S-311a for Rubber Sheeting; CCC-S-271 for Wide Bleached Cotton Sheeting; CCC-T-191a for General Specifications, Test Methods, Textiles; and DDD-T-86 for Bleached, Dyed, or Grey General-Use Cotton Tape.

U. S. Gov., Federal Specification ZZ-P-51; 1933. Amendment 2; 1944. Pads; Surgical-Operating. Covers a single grade, reversible type, made from sheeting coated on both sides with natural rubber, synthetic rubber, or a suitable mixture of natural rubber and synthetic rubber. Gives requirements for construction, fittings, finished sheeting, pressure test and brand; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4; rubber sheeting, *see* 204.33.

204.54 Stomach and Colon Tubes

American Hospital Assn., 10-73. Colon Tubes. Covers one type. Based on U. S. Gov. Federal Specifications ZZ-T-751.

American Hospital Assn., 10-76. Lavage and Stomach Tubes. Covers one type and one grade consisting of tube and funnel. Based on U. S. Gov. Federal Specifications ZZ-T-791.

U. S. Gov., Federal Specification ZZ-T-751; 1930. Amendment 1; 1944. Tubes; Colon. Covers a single type having one opening in outlet end and one depressed velvet eye on side of outlet end; 30 in. long and 30 French scale in diameter. Gives requirements for natural rubber or synthetic rubber, tensile strength, ultimate elongation, resistance to hot air, finish, and thickness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-T-791; 1933. Amendment 1; 1944. Tubes; Lavage and Stomach. Covers a single grade and a single type consisting of tube and funnel. Gives requirements for natural rubber or synthetic rubber, finish, design, tube, funnel, connection, tensile strength, ultimate elongation, resistance to hot air, and branding; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2793; 1939. Tube; Stomach, Rubber, Veterinary.

References.—Methods of testing rubber goods, *see* 200.

204.55 Catheters

American Hospital Assn., 10-28. Soft-Rubber Plain Urethral Catheters. Covers one type. Based on U. S. Gov. Federal Specifications ZZ-C-101 for Catheters and ZZ-R-601a for Methods of Physical Tests and Chemical Analysis of Rubber Goods.

U. S. Gov., Federal Specification ZZ-C-101; 1933. Catheters; Urethral, Plain, Soft-Rubber. Covers one type. Gives requirements for design, dimensions, rubber content, rigidity, tensile strength, ultimate elongation, and accelerated aging test; methods of sampling, inspection, and tests; add requirements for packaging, packing, and marking. Amendment 1, July 1943, substitutes synthetic rubber for rubber and changes maximum rigidity and tensile strength.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2780; 1939. Catheter; Rubber, Veterinary.

References.—Catheters, glass, metal, and woven, *see* 915.22; methods of testing, *see* 200.

204.59 Miscellaneous Surgeons' Goods

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2971; 1940. Isolator; Rubber.

References.—Other rubber surgeons goods, *see* 204.1, 204.2, 204.3; surgical instruments and equipment, *see* 915.2 to 915.5.

204.6 RUBBER TUBING

American Hospital Assn., 61-40. Rubber Tubing. Covers two grades. Based on U. S. Gov. Federal Specification ZZ-T-831b for Rubber Tubing (referred to below) and ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

U. S. Gov., Federal Specification ZZ-T-831b; 1941. Amendment 2; 1944. Tubing; Rubber. Covers three grades—(A) commercial gum rubber tubing, (B) synthetic rubber (buna S) tubing, and (L) laboratory pure gum rubber tubing; two types—(I) translucent and (II) block. Also covers plastic tubing (polyvinyl chloride base). Gives requirements for rubber and synthetic rubber tubing, plastic tubing, tables showing dimensions, physical requirements, accelerated aging test, details for plastic tubing (polyvinyl chloride base), and flammability; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33T7; 1945. Tubing; Rubber, Synthetic.

U. S. Gov., U. S. Army, Medical Dept. Specification 20-102A; 1940. Tubing; Stethoscope, Rubber.

U. S. Gov., U. S. Army, Medical Dept. Specification 20-105; 1939. Tubing; Rubber, Special.

U. S. Gov., U. S. Army, Medical Dept. Specification 20-106; 1939. Tubing; Rubber, Gas.

References.—Methods of Testing, *see* 200; gas tubing, *see* 202.31.

204.9 MISCELLANEOUS RUBBER SUNDRIES

204.90 General Items

American Society for Testing Materials, D553-42; 1942. Methods of Test for Viscosity and Total Solids Content of Rubber Cements. Covers rubber cements containing organic solvents as differentiated from latex cements or dispersions of rubber in water. For weight of total solids after heating at 70 C., description of funnel type and falling cylinder viscosimeter, and procedures for viscosity measurement.

204.91 Rubber Bulbs

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2810; 1939. Bulb; Rubber, Compression (for Pipettes).

204.92 Rubber Cement

American Hospital Assn., 61-16. Rubber Cement (Artists' and Photographers' and Cold-Patching). Covers one grade in two types. Based on U. S. Gov. Federal Specifications ZZ-C-191a for Rubber Cement (Artists' and Photographers' and Cold-Patching), referred to below, ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods, and ZZ-T-721c for Automobile and Motorcycle Inner Tubes.

U. S. Gov., Army Air Forces. Specification 26544-B-1; 1944. Cement; Rubber to Metal.

U. S. Gov., Army Air Forces. Specification 26571 (2); 1941. Cement; Synthetic Base.

U. S. Gov., Army Air Forces. Specification 26593-A; 1944. Cement; Rubber, Vulcanizing.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-54; 1942. Cement; Rubber.

U. S. Gov., Federal Specification ZZ-C-191a; 1938. Amendment 1; 1944. Cement; Rubber (Artists' and Photographers' and Cold-Patching). Covers one grade and two types—(I) photographers' and artists' and (II) cold-patching. Gives requirements for materials, composition, color, adhesion, wrinkling, curling, shrinking, staining, and consistency; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33R5; 1944. Rubber (Synthetic) and Cement for Lining Ferrous Pipe and Fittings (for Salt-Water, Lines).

U. S. Gov., Navy Dept. Specification 52C3e; 1943. Cement; Rubber.

U. S. Gov., Navy Dept. Specification 52C10; 1934. Cement; Rubber, Non-Hardening.

U. S. Gov., U. S. Army, Army Air Forces. Specification 20-7; 1926. Cement; Rubber, Colored, for Marking Balloons and Airships.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-29B; 1927. Cement; Rubber.

204.93 Erasers

American Hospital Assn., 49-13. Rubber and Rubber-Substitute Erasers. Covers one grade in five types. Based on U. S. Gov. Federal Specification ZZ-E-661a for Rubber and Rubber-Substitute Erasers, referred to below.

U. S. Gov., Federal Specification ZZ-E-661a; 1936. Amendment 2; 1939. Erasers; Rubber and Rubber-Substitute. Covers one grade and five types—(A) pencil (rubber), (B) ink (rubber), (C) typewriter, (D) pencil (rubber-substitute), and (E) combination pencil and ink (one-half type (A) and one-half type (B) stock). Gives requirements for dimensions, hardness, and accelerated aging test; methods of sampling, inspection, and tests: and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-E-661a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substitutes four types in lieu of five—(A) pencil eraser, (B) ink (rubber), (C) typewriter, and (D) pencil (rubber-substitute); and changes requirements accordingly.

204.94 Rubber Inflators

204.95 Rubber Stoppers

U. S. Gov., Federal Specification ZZ-S-751; 1932. Stoppers; Rubber. Covers two types—(A) solid and (B) perforated; and two grades—(I) laboratory and (II) common. Gives requirements for material, dimensions of stoppers, hardness, perforations, steaming test, and acetone extract; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 20-98A; 1941. Stopper; Rubber, for Vaccine Bottle, With Sleeve and Hollow Core.

References.—Methods of testing, *see* 200.

204.96 Rubber Tips for Crutches and Furniture

American Hospital Assn., 61-37. Rubber Tips for Crutches, Furniture, Etc. Covers one grade and one type. Based on U. S. Gov. Federal Specification ZZ-T-351 for Rubber Tips for Crutches, Furniture, Etc., referred to below.

U. S. Gov. Federal Specification ZZ-T-351; 1935. Tips; Rubber, (for) Crutches, Furniture, Etc. Covers a single grade. Gives requirements for material, bid sample, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-T-351; 1943, deletes use of any new natural rubber.

U. S. Gov., Navy Dept. Specification 33T6; 1944. Tips; Rubber (Reclaimed) (for Tables and Benches).

References.—Methods of testing, *see* 200.

204.99 Rubber Sundries Not Classified

U. S. Gov., U S. Army, Medical Dept. Specification 10-2663; 1939. Ring; Moldine.

205. HARD-RUBBER GOODS

205.1 ELECTRICAL GOODS, HARD RUBBER

U. S. Gov., U. S. Army, Signal Corps. Specification 20-85; 1928. Strap; Type ST-21, Battery-Carrying.

References.—Methods of testing rubber goods, *see* 200; rubber linemen's gloves, *see* 203.2; rubber insulation, *see* 719.55, 719.56.

205.2 LABORATORY APPARATUS, HARD RUBBER

U. S. Gov., Federal Specification ZZ-T-91; 1935. Tanks; Photographic, Hard-Rubber, Developing and Fixing. Covers one grade, suitable for contact with photographic solutions, alkaline developer, acid hypo, acid silver nitrate, cyanides, and alcohol. Gives requirements for dimensions, water absorption, alcohol extract, tensile strength, ultimate elongation, warping, and impact strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-T-636; 1935. Trays; Photographic, Hard-Rubber. Covers one grade for use in contact with such photographic solutions as alkaline developer, acid hypo, acid silver nitrate, cyanides, and alcohol. Gives requirements for dimensions, water absorption, alcoholic extract, tensile strength, ultimate elongation, warping, impact strength, methods of sampling, inspection, tests, requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-T-636; 1943, requests the use of Trays; Photographic, Enameled; Federal Specification RR-T-646, which uses no hard rubber.

U. S. Gov., U. S. Army, Medical Dept. Specification 20-89A; 1941. Sprinkler; Powder, Hard-Rubber.

References.—Rubber tubing, *see* 204.6.

205.3 SURGICAL GOODS, HARD RUBBER

205.4 TOILET ARTICLES OF HARD RUBBER

U. S. Gov., Federal Specification ZZ-C-551; 1935. Combs; Rubber (Hard). Gives detail requirements for design, dimensions, and color; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-C-551; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) substitutes Federal Specification L-C-568 for Combs; Plastic.

205.5 TRAYS, HARD RUBBER

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications No. 52. Trays; Hard-Rubber Composition.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-39a; 1944. Trays; Serving, Non-Metallic. Covers one grade and three types—(I) rectangular trays, (II) oval trays, and (III) round trays. Gives requirements for sizes, material, workmanship, construction, finish, color, odor, resistance to impact, impact strength, rigidity, chemical resistance, resistance to hot water, marking, and details for each type; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-G-340; 1940. Trays; Serving, Special Hard-Rubber Composition.

205.9 MISCELLANEOUS HARD-RUBBER GOODS

U. S. Gov., U. S. Army, Medical Dept. Specification 20-90A; 1941. Bottle; Ink, Hard-Rubber.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-12; 1923. Rod; Photographic, Stirring, Hard-Rubber.

206. RUBBER TIRES, CASINGS, AND TUBES

206.0 GENERAL ITEMS

American Society for Testing Materials, D 412-41; 1941. American Standards Assn. J2.1-1942. Methods of Tension Testing of Vulcanized Rubber. For determining stress-strain properties, tensile strength, ultimate elongation, and permanent set of soft vulcanized rubber, such as tire carcass and tread compounds, or most mechanical rubber goods, but not for hard rubber. Description of terms, tension test apparatus, calibration of tension testing machine, set test apparatus, die for test specimens, test specimens, number of test specimens, procedure, calculations, and report.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Agricultural Implement Tires. Recommended Practice for Rib Tread, Moderate Traction Tread, Traction Implement, Plow Tail Wheel, Hillside Combine, and Rice Binder, AI-1; 1944. Gives tables showing tire size, number of plies, tire loads at various inflation pressures, recommended load and inflation, recommended rim, maximum tire section, tube group number or size, and valve.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Agricultural Implement Tires. Experimental Practice for Heavy Duty Traction, AI-2; 1944. Gives tables showing tire size, number of plies, tire loads at various inflation pressures, recommended load and inflation, recommended rim, tube group number or size, and valve.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Agricultural Tractor Tires. Recommended Practice for Front Wheel, AT-1; 1944. Gives tables showing tire size, number of plies, tire loads at various inflation pressures, recommended load and inflation, recommended rim, maximum tire section, tube size or group number, and valve.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Agricultural Tractor Tires. Recommended Practice for Rear Wheel (Cane and Rice), AT-2A; 1944. Gives tables showing tire size, number of plies, tire loads at various inflation pressures, recommended load and inflation, recommended rim, maximum tire section, tire group number or size, and valve.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Garden Tractor Tires. Recommended Practice, AT-3A; 1944. Gives tables showing tire size, number of plies, tire loads at various inflation pressures, recommended load and inflation, recommended rim, maximum tire section, and valve.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Industrial Tractors Tires. Recommended Practice for Front Wheel (Using Drop Center Rims), Front Wheel, (Using Flat Base Rims), and Rear Wheel, AT1-2A; 1944. Gives tables showing tire size, number of plies, tire loads at various inflation pressures, recommended load and inflation, recommended rim, maximum tire section, tube group number or size, valve, and flap.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Agricultural Tractor Tires. Recommended Practice for Rear Wheel, WT-2A; 1944. Gives tables showing tire size, number of plies, tire loads at various inflation pressures, recommended load and inflation, recommended rim, maximum tire section, tube size, and valve.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Combat Tire Bead Dimensions for Use on Divided Rims or Wheels (Military Standard). Drawing and table showing bead widths for tire sizes from 6.00-16 to 14.00-24.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Tires for Motorcycles and Side Cars, Recommended Practice, MC-1A. Covers inflation pressures for various loads for various sizes of tires.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Tires for Passenger Cars and House Trailers, Standard PC-1. Tire loads at various inflation pressures for various sizes of tires together with recommended practice.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Tires for Slow Speed Industrial Vehicles Under 10 Miles Per Hour for Use on Factory Floors and Smooth Surfaces, Recommended Practice, PI-1A. Gives maximum load and inflation pressures for 2, 4, 6, 8, and 10-ply tires of various sizes.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Earth-Moving Vehicles, Recommended Practice Table EM-2B. For maximum speed of 10 miles per hour. Gives tire size, ply rating, and tire loads at various inflation pressures for tires from 6.50-20 to 30.00-40.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Earth-Moving Vehicles, Recommended Practice Table EM-3C. For maximum speed of 25 miles per hour. Gives tire size, ply rating, and tire loads at various inflation pressures from 6.50-20 to 30.00-40.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Earth-Moving Vehicles, General Data, Recommended Practice. Gives tire size, ply rating, recommended and permissible rim, maximum tire section, minimum dual spacing, tube size, valve, and flap for tire sizes from 6.50-20 to 30.00-40.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Road Graders, Load and Inflation Table RG-3A, Recommended Practice. For maximum speed of 25 miles per hour. Gives tire size, number of plies, and tire loads at various inflation pressures for tires from 6.00-20 to 14.00-20.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Light Trucks and House Trailers, Load and Inflation Table LT-1. Gives tire size, number of plies, and tire loads at various inflation pressures for tire sizes 6.00-16 to 7.50-16.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Mining and Logging Service on Improved or Maintained Unpaved Roads, Recommended Practice Table ML-1. For maximum speed of 30 miles per hour. Gives tire size, ply rating, load, inflation, recommended and permissible rim, maximum tire section, minimum dual spacing, tube size, valves, and flap for tires from 7.00-20 to 34.00-32.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Trucks and Busses in Highway Service. General Data for Tires Mounted on Present Rims—Recommended Practice. Gives table showing tire size, number of plies, recommended and permissible rim, tire width, minimum dual spacing, tube size. valve, and flap for tires from 6.50-17 to 14.00-24.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Trucks and Busses in Highway Service. General Data for Tires Mounted on Rims of Advanced Design—Experimental Practice. Gives table showing tire size, number of plies, recommended and permissible rim, tire width, minimum dual spacing, tube size, valve, and flap for tires from 6.50-17 to 14.00-24.

U. S. Gov.. Dept. of Commerce, National Bureau of Standards. Commercial Standard CS-110-43; 1943. Tire Repairs—Vulcanized (Passenger, Truck, and Bus Tires). To provide recognized specifications for the repairing of passenger, truck, and bus tires which have sustained an injury but have many miles of road service left. Covers general requirements for the inspection of the injury to the tire; the minimum acceptable condition of the tire; the method of repair for maximum service; and the recommended wording of a uniform guarantee label.

U. S. Gov., Dept. of commerce, National Bureau of Standards. Technologic Paper T318; 1926. Endurance Tests of Tires. Describes the method developed at the Bureau for an accelerated endurance test for the tire carcass but not including abrasive resistance test of the tread; size of cleats on test drum and the axle loads used in tests were established in cooperation with the Rubber Assn. of America.

U. S. Gov., Joint Army-Navy Specification JAN-P-4; 1944. Packing for Overseas Shipment: Tires, Tubes and Flaps for Vehicles; General Specifications for.

206.1 PNEUMATIC TIRE CASINGS FOR AUTOMOBILES

Tire and Rim Assn., Inc. Military Supplement, July 1942. Highway and Mud and Snow Military Tire Balance Limits (Military Standard). Gives tire size, number of plies, and balance limits from 6.00-16, 6 ply to 14.00-24, 16 ply.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Recommended Marking for Tires for All U. S. Armed Forces and Lend-Lease.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Minimum Dual Center Spacings for Combat Tires (Defense Practice). Gives tire size (from 6.00 to 14.00), contour, and spacing.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. New Tire Size Standards (Military Standard). Gives size, number of plies, maximum load, inflation, and recommended rim.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Proposed Load-Inflation Table for Commercial Tires (Military Standard). Gives sizes, number of plies, various loads, and inflation.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Service Load and Inflation Table for Combat Tires (Military Standard). Gives tire sizes, loads, and inflation.

Tire and Rim assn., Inc. Military Supplement, Nov. 1943. Combat Tires and Rims (Military Standard). Gives tire size, number of plies, and rim contour from 6.00-16, 6 ply to 14.00-24, 20 ply.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Recommended Maximum Skid Depths for Lend-Lease Cross-Country Tires, Including Runflat Type (Recommended Practice). Gives table showing various tire sizes and maximum skid depths.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS-108-43. Treading Automobile and Truck Tires. To provide a nationally recognized specification for treading automobile and truck tires, and covers inspection of the tire to be treaded. Covers definitions, general requirements, preparation of tire, cement, application, curing equipment, thickness of undertread, curing temperature, guarantee, and labeling.

U. S. Gov., Federal Specification ZZ-T-381d; 1941. Amendment 1; 1944. Tires; Pneumatic, Automobile and Motorcycle. Covers five groups—(I) two and four-ply motorcycle tires; four and six-ply passenger car tires for rims 17 in. or greater; (II) passenger car tires for rims 16 in. or less; (III) six and eight-ply truck and bus tires; (IV) ten and twelve-ply truck and bus tires; and (V) fourteen and sixteen-ply truck and bus tires. Gives requirements for material and workmanship, carcass, cushion, tread, sidewall, bead, flap, branding, and details for each group; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 544A; 1942. Tire Retreading, Recapping, and Repairing. Covers: Type I—treading; class a—full retread, class b—full recap, and class c—top cap; and Type II—repairing; class a—sectional repair, class b—reinforcement repair, and class c—spot repairs. Retreading, recapping, and repairing shall be of the type regularly performed for commercial use. Gives requirements for material, curing, molds, tread thickness, undertread, and details for each type and class; inspection and tests; and packaging, packing, and marking.

References.—Methods of testing, *see* 206.0, 200; tire fabrics, *see* 303.8; rims, *see* 722.36.

206.2 PNEUMATIC TIRE CASINGS FOR MOTOR CYCLES, BICYCLES AND AIRPLANES

Tire and Rim Assn., Inc. Airplane Handbook, 1944. High Pressure Airplane Tires, Recommended Practice, Table AP-1. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of landing and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. High Pressure Airplane Tires—Service Load and Inflation Tables, Recommended Practice, Table AP-1A. Gives table showing various loads and inflation for various sizes.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. High Pressure Channel Tread Airplane Tires, Recommended Practice, Table AP-1B. Gives table showing tire and rim sizes, rating, and inflated dimensions for channel tread landing wheel tires, extra high pressure channel tread landing wheel tires, and channel tread tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. High Pressure Channel Tread Airplane Tires Service Load and Inflation Tables, Recommended Practice, Table AP-1C. Gives table showing load and inflation for extra high pressure channel tread landing wheel tires, channel tread landing wheel tires, and channel tread tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Low Pressure Airplane Tires, Recommended Practice, Table AP-2. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of landing wheel tires, tail wheel tires, and channel tread tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Low Pressure Airplane Tires—Service Load and Inflation Tables, Recommended Practice, Table AP-2A. Gives table showing load and inflation for landing wheel tires and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Beaching Gear Tires, Recommended Practice, Table AP-2B. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of low pressure main wheel tires, S. C. main wheel tires, low pressure tail wheel tires, and S. C. tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Beaching Gear Tires—Service Load and Inflation Tables, Recommended Practice, Table AP-2C. Gives table showing load and inflation for main wheel tires and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Extra Low Pressure Airplane Tires, Recommended Practice, Table AP-3. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of landing wheel tires and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Extra Low Pressure Airplane Tires Service Load and Inflation Tables, Recommended Practice, Table AP-3A. Gives table showing load and inflation for landing wheel tires and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Smooth Contour Airplane Tires, Recommended Practice, Table AP-5. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of landing wheel tires and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Smooth Contour Airplane Tires Service Load and

Inflation Tables, Recommended Practice, Table AP-5A. Gives table showing load and inflation for various sizes of landing wheel tires and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Smooth Contour Channel Tread Tail Wheel Tires, Recommended Practice, Table AP-5B. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Smooth Contour Channel Tread Tail Wheel Tires Service Load and Inflation Tables, Recommended Practice, Table AP-5C. Gives table showing load and inflation for various sizes of tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Airplane Nose Wheel Tires, Recommended Practice, Table AP-6. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of high pressure tires, low pressure tires, S. C. tires, low profile tires, and extra high pressure channel tires.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Recommended Marking for Tires for All U. S. Armed Forces and Lend-Lease.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Light Trucks and House Trailers. General Data for Tires Mounted on Tapered Bead Seat Rims, Recommended Practice. Gives table showing tire size, number of plies, recommended and permmssible rim, maximum tire section, minimum dual spacing, tube size, and valve.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Low Platform Trailers, Mobile Cranes, Shovels and Mining Cars. Recommended Practice, Table LP-1B. For maximum speed of 10 miles per hour on improved roads. Gives tire size, number of plies, load, inflation, recommended and permissible rim, maximum tire section, tube size, valve, and flap for tires from 6.00-20 to 14.00-24.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Tires for Trucks and Busses in Highway Service. Load and Inflation Table TB-2B. Gives tire sizes, number of plies, and tire loads at various inflation pressures.

U. S. Gov., Army Air Forces. Specification 26589; 1943. Casings; Aircraft Landing and Auxiliary (Synthetic Tread).

U. S. Gov., Army-Navy Aeronautical Specification AN-C-55d; 1944. Casings; Aircraft Landing, Nose, Tail, and Beaching Tire.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-82b; 1944. Casings; Repair and Treading of Used Aircraft Landing, Nose, Tail, and Beaching Tire.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-18; 1944. Repair and Treading Materials; Aircraft Tire and Inner Tube.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-513 for Retreading and Recapping Tires.

U. S. Gov. Federal Specification ZZ-T-401a; 1941. Amendment 1; 1944. Tires and Tubes (Inner); Bicycles. Covers three types—(I) single tube, (II) clincher casings—class A, pneumatic bicycle casings, and class B, motor bike casings, and (III) wire edged casings; and four inner tube sizes—endless and circular molded. Gives requirements for tires and casings, tubes, synthetic rubber, material, guarantee, branding, design, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—See references under 206.1; rim, *see* 722.36; airplane rims *see* 724.23.

206.3 INNER TUBES FOR PNEUMATIC TIRES FOR AUTOMOBILES

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Tube Valves and Fittings for Tire Assemblies Using Beadlocks (Military Standard). Gives tire sizes, rim contour, valve number, vertical, bends, horizontal, tip end, bridge washer, hexagon nut, valve lock, and valve cap. Covers rubber valves, metal valves, and optional valves.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Tube Valve and Fittings for Lend-Lease Runflat Tire Assemblies Using Metal Beadlocks (Military Standard). Gives table showing various tire sizes, wheel sizes, valve numbers, and dimensions.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Beadlock Valve Hole Details (Military Standard). Gives diagrammatic dimensional drawings.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Effective Vertical Valve Dimensions Relative to Original Vertical Dimension (Military Standard). Gives diagrammatical drawing and dimensions.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Repair Valve Stems For Convertible Valves (Military Standard). For tires used without beadlocks and for tires used with beadlocks.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Metal Valves for Tires Shown in This Handbook. Gives drawings with dimensions for five types.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Rubber Valves for Tires Shown in This Handbook. Gives drawings with dimensions for four types.

U. S. Gov., Federal Specification ZZ-T-721c; 1941. Tubes; Automobile and Motorcycle, Inner. Gives chemical, physical, and dimensional requirements; finished diameter, volume and length of inner tubes; and methods of sampling, inspection, and tests. Emergency Alternate Federal Specification E-ZZ-T-721c; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for finished diameter, volume, length, and strength of splice.

U. S. Gov. Federal Specification ZZ-T-766; 1935. Amendment 1; 1941. Tubes; Inner, Puncture-Sealing. Covers two types—(I) compressing the rubber to fill hole, and (II) by effecting a seal through the use of plastic type rubber compound placed in the tread portion of the tube. Gives physical, chemical, and dimensional requirements; puncture sealing test; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, *see* 206.0, 200.

206.4 INNER TUBES FOR PNEUMATIC TIRES OTHER THAN AUTOMOBILES

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Metal Valves Used With Tractor and Implement Tires, 1944. Dimensional drawings of various types.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Rubber Valves Used With Tractor and Implement Tires, 1944. Dimensional drawings of various types.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Airplane Valves in Finished Form as Installed on Wheels. Gives drawings with dimensions for various sizes of rubber covered type, rubber base (non-convertible type), and rubber base (convertible type), also valve fittings including bridge washers, ring washers, rim washers, hex nuts, lock nuts, wing nuts, rim slot lugs, and valve caps.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Convertible Valves. Gives drawings with dimensions for six types.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Convertible Valve Dimension Chart. For use in converting single bend valves into other shapes. Gives drawing with tables showing tool setting and dimensions.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Straight Valves. Gives drawings with dimensions for six types.

U. S. Gov., Army Air Forces. Specification 26563-B; 1942. Tube; Inner, Dual Seal (Smooth Contour for Aircraft Nose Wheels).

U. S. Gov., Army Air Forces. Specification 26582 (1); 1942. Tubes; Inner, Repair of (for Aircraft Use).

U. S. Gov., Army-Navy Aeronautical Specification AN-C-120-1; 1944. Caps; High Pressure Air Valve.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-14a; 1944. Inner Tubes; Aircraft Landing, Nose, Tail, and Beaching Tire.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-18; 1944. Repair and Treading Materials; Aircraft Tire and Inner Tube.

References.—Methods of testing, *see* 206.0, 200.

206.5 SOLID TIRES FOR AUTOMOBILES AND TRUCKS

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Industrial Truck and Trailer Solid Tires (Pressed-On and Cured-On Types). Gives table of maximum loads of various diameters of tires at maximum speed of 8 miles an hour.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Standard Industrial Truck and Trailer Solid Tire Sizes for Original Equipment. Gives sizes of tires for pressed-on and cured-on types. These sizes conform to Simplified Practice Recommendation R103-33, U. S. Dept. of Commerce, National Bureau of Standards.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R103-33; 1933. Industrial Truck and Trailer Solid Tires. This recommendation establishes a schedule of stock sizes of industrial truck solid tires of the pressed-on type, and stock sizes for industrial truck and trailer solid tires of the cured-on type. Initiated by Tire and Rim Assn., Inc.

U. S. Gov., Federal Specification ZZ-T-391; 1930. Amendment 2; 1937. Tires; Solid, Industrial and Truck. Covers the pressed-on type, with channel base band conforming to the Tire and Rim Assn. standards adopted by the Society of Automotive Engineers. Gives requirements for rubber tread stock, construction, dimensions, base band, and warranty; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, *see* 206.0, 200; rims. *see* 722.36.

206.9 MISCELLANEOUS TIRES

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-96-2; 1944. Tires; Bogie, Roller, and Idler; Rubber (Natural and Synthetic).

207. RUBBER AND BALATA BELTING, PACKING, AND GASKETS

207.0 GENERAL ITEMS

American Society for Testing Materials, D378-41; 1941. Methods of Testing Flat Rubber Belting. Covers the test procedure for evaluating the physical properties of the flat type of rubber belting which contains cotton duck reinforcement. The term "rubber" as used in these methods includes synthetic compounds as well as compounds of natural rubber. Such belting includes the types used for transmission of power or conveying and elevating material, and is classified as: Friction surface belt (possessing no distinct rubber cover other than that resulting from the rubber frictioning process); rubber covered belt (possessing a distinct rubber cover extending over the outside and around the edges of the belt); and fabric surface belt (possessing at least one face of plain uncoated duck). General methods, sampling, measurements of dimensions, test conditions, number of tests, tension tests of rubber parts, oil immersion tests, adhesion tests, beading test, tension tests of belting, and inspection and rejection.

Rubber Manufacturers Assn., Inc. Specification Data Book. Section I—Belting. Includes—(A) standard specifications for conveyor belt (conveying bulk material, coal, ore, cement, etc.); (B) supplement to standard specifications for conveyor belt—classifications for conveyor belt standards; (C) standard specifications for general elevator belting (elevating ore, rock, sand, gravel, etc.); (D) supplement to standard specifications for general elevator belting—classification of general elevator belting standards; (E) standard specifications for conveyor and elevator belting (package conveyors, grain conveyors or elevators); (F) standard specifications for railroad axle lighting belt; (G) width tolerances on transmission belt.

Rubber Manufacturers Assn., Inc. Specification Data Book. Section III—Methods of Test. Recommends American Society for Testing Materials test methods for use in the testing of belting and hose.

207.1 CONVEYOR BELTING

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Conveyor Belts (Rubber). Covers definition, forms, method of manufacture, properties, specifications, tests, uses, substitutes, and packing.

U. S. Gov., Federal Specification ZZ-B-206; 1933. Amendment 4; 1944. Belting; Conveyor, Rubber. Covers four types—(A) smooth rubber cover on both sides; (B) smooth rubber cover on pulley side, "rough top" rubber cover on carrying side; (C) friction surface on both sides; and (D) friction surface on pulley side and "rough top" rubber cover on carrying side. Gives requirements for material, workmanship, ply, tolerances, fasteners, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

207.2 ELEVATOR BELTING

Rubber Manufacturers' Assn. Specifications for Conveyor, Elevator, Grader, and Other Material Conveying Belts and Flat Transmission Belt (Undated).

207.3 TRANSMISSION BELTING

American Petroleum Institute, Div. of Production, Standard No. 1; 1940. Belting Specification. Includes leather, impregnated stitched cotton fabric, solid woven hair, solid woven cotton, balata, rubber, cord, and V-belts and sheaves. Gives physical and dimensional limits, tensile strength, elongation under prescribed loads, and permissible variations. Also adhesion between the plies of rubber and balata belting requirements and methods of test.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Transmission Belting; Rubber. Covers definition, forms, method of manufacture, properties, specifications, tests, uses, substitutes, and packing.

U. S. Gov., Treasury Dept., Procurement Div., No. 578; 1942. Belting; Power Transmission, Rubber and Fabric, "V" Type (Industrial). Shall be made from cleaned cotton, of synthetic fibers, and rubber. Rubber shall include synthetic as well as natural rubber compounds. Gives requirements for construction, outer section, center section, inner section, rubber compound, exterior surfaces, outer face, sides, pulley face, physical characteristics, tolerance, and friction; methods of sampling, inspection, and testing; and packaging, packing, and marking.

References.—Methods of testing, *see* 200; belt duck tolerances, *see* 207.0; leather belting, *see* 066.3; cotton belting, *see* 314.1.

207.4 PACKING AND GASKETS

References.—Rubber gaskets, rubber packing, *see* 707.13, 707.24.

208. MISCELLANEOUS RUBBER PRODUCTS

208.1 RUBBER FLOOR COVERINGS

American Hospital Assn., 25-10. Rubber Floor Tile. Covers one type and one grade. Based on U. S. Gov. Federal Specifications ZZ-T-301 for Rubber Floor Tile (referred to below) and Federal Specification ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

American Hospital Assn., 61-31. Rubber Mats for Shower Stalls. Covers one type, grade, and class. Based on U. S. Gov., Navy Dept., Specification 27 M 12 for Rubber Mats for Shower Stalls (referred to below) and Federal Specification ZZ-R-601a for General Specifications (Methods of Physical Tests and Chemical Analyses) Rubber Goods.

American Hospital Assn., 61-34. Rubber Matting. Covers one grade and two types. Based on U. S. Gov. Federal Specifications ZZ-M-71 for Rubber Matting (referred to below), ZZ-R-601a for General Specifications (Methods of Physical Testing and Chemical Analyses) Rubber Goods, and CCC-T-191a for General Specifications Test Methods Textiles.

American Society for Testing Materials, D178-24; 1924. American Standards Assn., C59.4-1935. Rubber Matting for Use Around Electrical Apparatus or Circuits Not Exceeding 3,000 Volts to Ground. Construction, tensile strength and elongation requirements, test requirements for voltage and dielectric strength tests, and minimum thickness.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS14; 1939. Indentation and Recovery of Low-Cost Floor Coverings. Indentation and recovery determinations for loads ranging from 25 lb. to 200 lb. on a flat-ended pin 1/4 in. in diameter were made on 23 floor coverings at a relative humidity of 65 percent and temperature of 72° F. Indentation readings were taken for each load at intervals of time up to 30 min. and then recovery readings at intervals of time up to 120 min. Various types of floor coverings were tested, such as asphalt tile, pressed fiber board, linoleums, felt base floor coverings having various wearing surfaces—rubber and wood. A description of the apparatus and the procedure used are given. The results are presented in graphic form to show the relative merits of the various floor coverings with respect to initial and 30-min. indentation under various loads and the recovery after removal of the load.

U. S. Gov. Federal Specification ZZ-F-461; 1936. Amendment 1; 1938. Floor-Covering; Rubber, Sheet. Covers one grade, made of rubber compound and cotton sheeting. Gives requirements for design, surface, width and thickness, hardness, and flexibility; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-F-461, Mar. 1943, (issued by Procurement Div., Treasury Dept., U. S. Gov.). Requirements for this specification are covered by Federal Specification LLL-F-471, Floor Covering; Felt Back.

U. S. Gov., Federal Specification ZZ-M-46; 1940. Mats; Floor, Rubber, Link-Type. Covers one grade and two classes—(A) made of rubber compound and (B) made of a rubberized fabric. Gives requirements for material, workmanship, odor, staining, weight, links, design of mats, dimensions, color, and accelerated aging; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-M-46; 1942, requirements covered by Federal Specification DDD-M-156, Mats; Door, Fiber.

U. S. Gov., Federal Specification ZZ-M-61; 1939. Mats; Rubber, Cuspidor. Covers one grade and two types—(I) without cotton backing or insertion and (II) with cotton backing or insertion; either corrugated or smooth surface. Gives requirements for size, physical properties, cotton sheeting, and friction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-M-71; 1933. Amendment 2; 1941. Matting; Rubber. Covers one grade and two types—(A) longitudinal corrugations and (B) diamond-shaped or knob-shaped corrugations. Gives requirements for design, surface, width, thickness, and rubber compound; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-M-81; 1933. Amendment 2; 1941. Matting; Rubber (for Use Around Electrical Apparatus or Circuits Not Exceeding 3,000 Volts to Ground). Covers a single grade—made of a rubber compound and cotton fabric. Gives requirements for design, surface, dimensions, rubber compound, fabric, friction, flexibility, voltage, and dielectric strength tests; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-T-301; 1938. Tile; Floor, Rubber. Covers a single grade—consisting of a vulcanized rubber compound with or without fabric. Gives requirements for design, color and pattern, thickness, size of tile, modulus at 10 percent elongation, hardness, fabric, and friction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-T-301; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substitutes Federal Specification LLL-L-361, Linoleum; Plain, Inlaid, and Printed.

U. S. Gov., Navy Dept. Specification 27 M 16; 1943. Matting; Rubber, Natural or Synthetic (for General Purposes Other Than for Use on Weather Decks and Around Electrical Apparatus).

U. S. Gov., Navy Dept. Specification 27 M 17; 1944. Matting; Rubber (Reclaimed) (for Use Around Electrical Apparatus or Circuits Not Exceeding 3,000 Volts to Ground).

U. S. Gov., Navy Dept. Specification 27 M 20; 1943. Matting; Synthetic-Rubber and Plastic-Elastomer (for Use Around Electrical Apparatus or Circuits Not Exceeding 3,000 Volts to Ground).

U. S. Gov., U. S. Army, Medical Dept. Specification 20-107A; 1941. Mat; Rubber, for Dental Chair.

References.—Methods of testing, *see* 200.

208.2 RUBBER BANDS

U. S. Gov., Federal Specification ZZ-B-111; 1931. Amendment 2; 1941. Bands; Rubber. Covers one grade. Gives requirements for dimensions, weight, physical properties, and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, *see* 200.

208.3 RUBBER CEMENT AND COMPOUNDS

References.—Rubber cement, *see* 204.92

208.4 RUBBER INSULATIONS

American Society for Testing Materials, D532-39T; 1939. Tentative Specifications for Rubber Sheath Compound for Electrical Insulated Cords and Cables. Covers a durable vulcanized rubber compound for use as the outer covering or sheath on insulated electrical cords and cables. Requirements for sampling, physical properties, tear test, and for other tests using A.S.T.M. Method D470. A.S.T.M. Emergency Alternate Provision EA-D-532; 1942, affected section 3 (physical requirements), section 6 (test specimens), and section 8 (methods of testing).

References.—Rubber battery jars, *see* 205.1; rubber floor covering, *see* 208.1; rubber gloves, *see* 203.2; rubber covering for electric wires, *see* 719.55; rubber tape, friction tape, *see* 719.55, 719.56.

208.5 RUBBER TUBING

U. S. Gov., U. S. Army, Army Air Forces. Specification 20-28; 1926. Tubing; Manometer, for Balloon and Airship Use.

References.—Rubber tubing, *see* 204.6.

208.6 RUBBER JAR RINGS

U. S. Gov., Federal Specification ZZ-R-351; 1934. Rings; Jar, Rubber. Covers the "lipped" type and a single grade. Gives requirements for dimensions, strength and elongation, accelerated aging and steam-pressure tests, and labels; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

208.7 RUBBER MATTRESSES AND CUSHIONS

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-25a; 1941. Mattresses; Latex Rubber Foam. Shall be that known as "latex rubber foam." Grade be as described herein. Thickness shall be 3, 4, 5, and 6 in., and sizes shall be as specified. Gives requirements for rubber, ticking, zippers, snap fasteners, thread, workmanship, odor, structure, accelerated aging, washability, cover, identification, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-26; 1941. Cushions and Cushioning Material; Latex Rubber Foam. The type shall be that known as "latex rubber foam"; class A—cored cushions, class B—slab cushioning material, and sizes and shapes shall be as specified. Gives requirements for material, workmanship, odor, structure, accelerated aging, washability; tolerances for length, width, and thickness; models, sampling, inspection, and tests.

208.8 RUBBER MATS

U. S. Gov. U. S. Maritime Commission. Specification 27-MC-39a; 1942. Mats; Rubber, for Tub or Shower Stall. Mats shall be of the suction cup, non-skid type and there shall be but one grade. Gives requirements for materials, workmanship, size, shape, color, surfaces, suction cups, perforations, weight, rubber compound, sampling, inspection, and tests.

208.9 MISCELLANEOUS MECHANICAL RUBBER GOODS

208.91 Bumpers of Rubber

208.92 Ear Cushions

208.93 Expansion Joints, Machinery Mountings

American Assn. of State Highway Officials, M58-42. Standard Specifications for Preformed Expansion Joint Fillers for Concrete (Cork, Self-Expanding Cork, Sponge Rubber, and Cork-Rubber Types). Gives scope, manufacture, character of strips, properties, dimensions and permissible variations, packing, sampling, and methods of testing.

American Society for Testing Materials, D544-41; 1941. Preformed Expansion Joint Fillers for Concrete (Nonextruding and Resilient Types). Includes cork, self-expanding cork, sponge rubber, and cork rubber. Manufacture, character of strips, properties, dimensions and permissible variations, packing, sampling, and methods of testing.

American Society for Testing Materials, D545-41; 1941. Methods of Testing Preformed Expansion Joint Fillers for Concrete (Nonextruding and Resilient Types). Procedures covering tests for expansion in boiler water, recovery, compression, extrusion, boiling in hydrochloric acid, and weathering.

U. S. Gov., Federal Specification HH-F-334; 1941. Filler; Expansion-Joint, Preformed, Nonextruding-Bituminous-Fiber Type (for Concrete). Gives requirements for material, recovery, compression, loss of weight, and extrusion; methods of sampling and testing; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-F-341; 1940. Filler, Expansion-Joint, Preformed; Nonextruding and Resilient Types (for Concrete). Covers four types—(I) cork, (II) sponge rubber, (III) self-expanding cork, and (IV) cork-rubber. Gives requirements for materials, recovery, compression, extrusion, and expansion; methods of sampling and testing; and requirements for packaging, packing, and marking for shipment.

208.94 Pads

U. S. Gov., Treasury Dept., Procurement Div., No. 522; 1941. Pads; Typewriter, Sponge Rubber. Gives requirements for material, construction, alternate constructions, shape and size, color, density of rubber, compressibility, odor, and accelerated aging; methods of sampling, inspection, and test; and packaging, packing, marking.

References.—Rubber surgical pads, *see* 204.53.

208.95 Rubber Washers

Underwriters' Laboratories, Inc. Specification for Rubber Discs for Dry Pipe Valves, 1936. Requires that rubber must not adhere to metal seat rings and must withstand cutting and abrasion. Chemical and physical tests.

U. S. Gov., Navy Dept. Specification 33D1; 1945. Disks; Rubber, Cellular, Hard.

209. MISCELLANEOUS RUBBER MANUFACTURES

209.1 DREDGING SLEEVES

U. S. Gov., Federal Specification ZZ-S-451; 1933. Sleeves; Dredging. Covers the "wrapped" type and a single grade. Gives requirements for construction, tube, cover, duck, weight, thread count, breaking strength, rubber layer, rubber end caps, end covers, and physical requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-S-451, July 1943, changes chemical and physical requirements.

References.—Methods of testing, *see* 200; hose duck, *see* 202.0.

209.2 HORSESHOE PADS

209.4 PLUMBERS' FORCE CUPS

U. S. Gov., Federal Specification ZZ-F-566; 1935. Amendment 1; 1944. Force-Cups; Plumbers'. Covers two types—(A) long handled and (B) short handled. Gives requirements for material, workmanship, construction, marking, tolerances, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 41-MC-2a; 1942. Force Cups; Plumber's. There shall be but one type and grade. Gives requirements for rubber, handles, workmanship, construction, rubber (accelerated aging), marking, sampling, inspection, and method of test.

209.5 SQUILGEES

American Hospital Assn., 34-136. Squilgees. Covers one type and grade. Based on U. S. Gov., Navy Dept., Specifications 38 S 2a. Squilgees.

U. S. Gov., Treasury Dept., Procurement Div., No. 458; 1941. Squilgees; for Floors and Windows. Covers two types—(I) wood block with wood handle, for floors, and (II) brass or bronze ferrule and frame, with wood handle, for windows. Gives requirements for handles, rubber blades, drawings, blocks, ferrule, sizes, metal strips, channel metal, rubber blades, screws, handles, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

209.6 WEATHER STRIPPING

209.7 GROMMETS OR BUSHINGS

U. S. Gov., Army-Navy Aeronautical Specification AN-G-21-1; 1944. Grommets; Elastic.

References.—Bushings, *see* 710.

209.8 RUBBER HOSE TIPS

209.9 MISCELLANEOUS RUBBER GOODS

209.91 Rubber Balls

National Collegiate Athletic Assn. Official Lacrosse Guide, LC44. Ball. Includes requirements for material, circumference, weight, and height of bounce.

U. S. Golf Assn. Rules of Golf, 1944-45. Includes requirements for form and make of golf clubs and balls.

209.92 Ice Hockey Puck

National Collegiate Athletic Assn. Official Ice Hockey Guide, IH45. Puck for Ice Hockey. Includes requirements for material (vulcanized black rubber), thickness, diameter, and weight.

209.99 Rubber Goods Not Elsewhere Classified

Society of Automotive Engineers. 1942 Handbook, Section 4—Fabricated Materials. Includes SAE Standard Rubber Compounds for Engine Mounts. Table of physical characteristics for ten classifications of rubber compounds.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-161. Guard; Saw, Rubber.

U. S. Gov., Navy Dept. Specification 33B3; 1944. Buoyancy-Material; Hard, Cellular, Rubber.

U. S. Gov., Navy Dept. Specification 33L2b; 1944. Lining; Rubber (Synthetic) for Salt-Water Lines.

U. S. Gov., Navy Dept. Specification 33L4a; 1942. Lining; Rubber, for Battery Compartments of Submarines.

U. S. Gov., U. S. Army, Army Air Forces. Specification 20-81; 1928. Ring; Molded Rubber.

U. S. Gov., U. S. Army, Army Air Forces. Specification 20-82A; 1938. Rubber; Round Strip.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 20-101A; 1942. Rubber; Molded.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-3837A; 1941. Plug; Rubber, Submarine Mine.

U. S. Gov., U. S. Army. Ordnance Dept. Specification 89-3953; 1940. Cushion; Rubber, Firing-Device.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-567; 1931. Syringe; Type M-21, Bulb Type for Filling Storage Batteries.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-26; 1939. Balloon; Meteorological, Pilot, Types ML-50, ML-51, and ML-64.

References.—Rubber pump-valves, *see* 707.3: rubber gas masks. *see* 993.

210-219 GUMS, RESINS, AND BALSAMS

211. TURPENTINE TAR AND PITCH

211.0 GENERAL ITEMS

211.1 TURPENTINE

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary Seventh Edition, 1942. Turpentine. Gum Thus or Gum Turpentine. Gives chemical composition, description, solubility, reaction, alcohol-insoluble substances, and preparation.

American Society for Testing Materials, D 13-34; 1934. American Assn. of State Highway Officials, M127-42. American Standard Assn., K32-1937. Spirits of Turpentine. For gum spirits of turpentine, steam-distilled wood turpentine, sulfate wood turpentine, and destructively-distilled wood turpentine. Gives physical requirements, appearance, color, odor, and methods of testing.

American Society for Testing Materials, D 233-44T; 1944. Tentative Methods of Sampling and Testing Turpentine. Gives detailed methods for sampling during loading of tank cars, from loaded tank car or other large vessel, barrels, and small containers. Gives procedure for determination of water, appearance, color, odor, specific gravity, refraction index, distillation range, table of barometric corrections, polymerization, and apparatus required.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Turpentine Oil (Spirits of Turpentine). Tentative method for determination of color, specific gravity, refractive index, distillation, official method for determination of mineral oil.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Turpentine. Covers definition, constants, derivation, uses, grades, substitutes, and hazards.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcements, Naval Stores No. 1; 1938. Regulations for the Enforcement of the Naval Stores Act. Includes Turpentine. Covers gum spirits of turpentine, steam-distilled wood turpentine, destructively-distilled wood turpentine, and sulphate wood turpentine. Regulations include—definition of terms, scope of the act, establishing new or modified standards, loan and care of duplicates of U. S. rosin standards, inspectors, samples (analysis, classification, and grading), certificates, sampling, marking containers of naval stores (cost of analysis, classification, and grading), payment for services (labels, invoices, advertising, and shipping documents), hearings, publication of findings, and The Naval Stores Act. Mar. 3, 1923.

211.2 PINE-TAR OIL

211.3 PINE OIL

American Hospital Assn., 16-19. Pine Oil Disinfectant. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Commercial Standard CS69-38 for Pine Oil Disinfectant, referred to below.

American Society for Testing Materials, D 802-44 T, 1944. Tentative Methods of Sampling and Testing Pine Oil. Covers scope, sampling, appearance, specific gravity, refractive index, distillation, polymerization, moisture, and total terpene alcohols.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS69-38; 1938. Pine Oil Disinfectant. This standard covers materials, physical and chemical properties, and certification of quality of pine oil disinfectant. Initiated by the National Assn. of Insecticide and Disinfectant Manufacturers.

U. S. Gov., Navy Dept. Specification 52012; 1923. Oil; Pine.

211.4 TAR (NOT INCLUDING COAL TAR)

U. S. Gov., Federal Specification JJJ-T-121; 1942. Tar; Pine, Technical Grade. Covers one type and one grade. Gives requirements for color of film, distillation range, and viscosity; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pine Tar (Pix Liquida). Description, solubility, identification, reaction, ash, and storage. U.S.P. products of pine tar—Oleum Picis Rectificatum, Unguentum Picis Pini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pine Tar Ointment. Preparation.

211.5 TALL OIL

American Society for Testing Materials, D 803-44 T, 1944. Tentative Methods of Testing Tall Oil. Covers scope, sampling, conditioning, viscosity, pour point, flash and fire points, color, moisture, acid number, saponification number, rosin acids number, rosin acids, qualitative test for rosin, unsaponifiable matter, and fatty acids.

American Society for Testing Materials, D 804-44 T, 1944. Tentative Definition of Terms Relating to Tall Oil. Discusses definitions relating to tall oil and defines rosin acids, skimmings, tall oil, tall oil abietic acid, tall oil pitch, and tall oil soap.

212. CAMPHOR

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Camphor. Chemical symbol, synonyms, description, and preparations for tincture, dilutions, medications, triturations, and saturated tincture for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Camphor. Description, solubility, specific gravity, melting point, optical rotation, moisture, non-volatile matter, halogens, and storage. U.S.P. products of camphor—Aqua Camphorae, Linimentum Camphorae, Linimentum Camphorae et Saponis, Linimentum Chloroformi, Spiritus Camphorae, Tinctua Opii Camphorata.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Camphorated Tincture of Opium (Paregoric). Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., 1942. Spirit of Camphor. Specific gravity, added water, assay, alcohol content, and storage.

213. CHICLE

214. BALSAMS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Balsam of Peru. Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Peruvian Balsam. Description, solubility, specific gravity, reaction, fixed oils, rosin, turpentine, acid value, cinnamein, saponification value, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Storax (Liquid Storax). Description, solubility, loss on drying, rosin or rosin oil, alcohol-insoluble residue, alcohol-soluble residue, acid value, saponification value, and cinnamic acid. U.S.P. product of storax—Tinctura Benzoini Composita.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Tolu Balsam (Tolu Tincture). Preparation and alcohol content. U.S.P. product of tincture of tolu balsam—Syrupus Balsami Tolutani.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tolu Balsam. Description, solubility, reaction, rosin, rosin oil or copaiba, acid value, saponification value, and storage. U.S.P. product of tolu balsam—Syrupus Balsami Tolutani, Tinctura Benzoini Composita, Tinctura Balsami Tolutani.

215. VARNISH GUMS AND RESINS

U. S. Gov., Navy Dept. Specification 52G9a; 1932. Gum; Yacca, Red.

References.—Varnish gums and resins, *see* 846.6; rosin, *see* 216.

216. ROSIN

American Society for Testing Materials, D 269-30; 1930. American Standards Assn., K 21.1-1936. Method of Test for Toluene Insoluble Solid Matter in Rosin (Chiefly Sand, Chips, Dirt, and Bark). Covers the treatment of sample and outlines procedure.

American Society for Testing Materials, D 464-42; 1942. Method of Test for Saponification Number of Rosin. Employs an internal indicator. Is not recommended for use with rosins of grades darker than G.

American Society for Testing Materials, D465-42; 1942. Method of Test for Acid Number of Rosin. Employs an internal indicator. Is not recommended for use with rosins of grades darker than G.

American Society for Testing Materials, D509-44T; 1944. Tentative Methods of Sampling and Grading Rosin. For sampling and determining the grade of rosin delivered in commercial bags, barrels, or drums. Gives apparatus, sampling, grading, and tolerance.

American Society for Testing Materials, E28-42T; 1942. Tentative Method of Test for Softening Point (Ball and Shouldered Ring Apparatus). Applicable to asphalts, tars, pitches, rosins, and most resins—both natural and synthetic. Apparatus, preparation of sample, procedure, softening point, precautions, and reproducibility of results.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Naval Stores. Rosin. Analytical methods for sampling and determination of acid number, saponification number, toluene-insoluble material, petroleum benzin-insoluble matter, ash, volatile oils, and determination of grade.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Rosin. Covers definition, occurrence, constants and properties, solubility, grades, impurities, uses, and marketing.

Technical Assn. of the Pulp and Paper Industry. Analysis of Rosin, Standard T 621 m-42; 1942. Gives various grade classifications, based on color of gum residue. Covers sampling, color, grade, acid number, saponification number, ester number, unsaponifiable matter, ash, and toluene-insoluble matter.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Rosin (Colophony). Description, solubility, specific gravity, ash, reaction, acid value, and storage. U.S.P. product of rosin—Ceratum Resinae.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcements, Naval Stores No. 1; 1938. Regulations for the Enforcement of the Naval Stores Act. Includes rosin. Covers both gum and wood rosin. Regulations include definition of terms, scope of the Act, standards for classification and grading of rosin, establishing new or modified standards, loan and care of duplicates of U. S. Rosin Standards, inspectors, samples (analysis, classification, and grading on request), certificates, sampling, marking containers of Naval Stores (cost of analysis, classification, and grading), payment for services (labels, invoices, advertising, and shipping documents), hearings, publication of findings, and The Naval Stores Act, Mar. 3, 1923.

U. S. Gov., Federal Specification LLL-R-626; 1942. Amendment 1; 1944. Rosin. Covers gum and wood rosin in two types—(I) lump (grades FF, D, E, I, K, N, WG, and WW) and (II) powdered. Gives requirements for color, clarity, toluol-insoluble matter, softening point, and acid value for type I; and toluol-insoluble matter, particle size, and heat test for type II; methods of sampling, inspection, and test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-6; 1924. Rosin; Powdered, Lithographers'.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1090; 1939. Rosin; U.S.P.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-73; 1930. Pitch; Burgundy.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 2-97; 1936. Wax (Saddler's and Stitching).

217. MISCELLANEOUS GUMS, BALSAMS, AND RESINS

American Gum Importers Assn. Natural Resins. Handbook, 1939. Basic data on the natural resins, their physical and chemical properties, solubilities in a wide range of paint, varnish, and lacquer solvents and thinners; the compatibility of the natural resins with other resinous products, cellulose derivatives, waxes, pitches, asphalts, drying and nondrying oils; the applications of the resins alone and in combination with other materials in both their original and thermally-processed forms.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of the U. S., 1941. Olibanum. Natural order, synonyms, description, and preparation for triturations for use in homoeopathic medicines.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Accroides Gum (Acaroid Resin, Yacca Gum, Black Boy Gum). Covers definition, constants, solubility, uses, grades, containers, derivation, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Damar. Covers definition, constants, solubility, derivation, grades, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Gum Arabic. Covers definition, properties, purity, grades, substitutes, containers, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Gum; Mastic. Covers definition, constants, solubility, grades, containers, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Kauri Gum. Covers definition, constants, solubility, derivation, uses, grades, and containers.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Gum; Sandarac. Covers definition, constants, solubility, grades, containers, uses, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Resins; Copal. Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Acacia (Gum Arabic). Description, solubility, identification, optical rotation, water-insoluble residue, starch or dextrin, and tannin-bearing gums. U.S.P. product of acacia—Mucilago Acaciae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Benzoin. Description, identification, cinnamic acid, benzoic acid assay, and storage. U.S.P. products of benzoin—Tinctura Benzoini, Tincture Benzoini Composita.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Granulated Opium. Preparation, description, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mucilage of Tragacanth. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mucilage of Acacia (Mucilage of Arabic Gum). Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Myrrh (Gum Myrrh). Description, identification, and assay. U.S.P. product of myrrh—Tinctura Myrrhae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oleoresin of Aspidium (Oleoresin of Male Fern, Oleoresin of Marginal Fern). Description, solubility, specific gravity, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Opium (Gum Opium). Description and assay. U.S.P. products of opium—Aethylmorphinae Hydrochloridum, Apomorphinae Hydrochloridum, Codeina, Codeinae Phosphas, Codeinae Sulfas, Dihydromorphinonae Hydrochloridum, Morphinae Sulfas, Opium Granulatum, Opium Pulveratum, Tinctura Opii, Tinctura Opii Camphorata, Tabellae Codeinae Phosphatis, Tabellae Codeinae Sulfatis, Tabellae Dihydromorphinonae Hydrochloridi, Tabellae Morphinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Powdered Opium. Preparation, description, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Benzoin. Preparation and alcohol content. Compound Tincture of Benzoin. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Myrrh. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tragacanth (Gum Tragacanth). Description, identification, and karaya gum. U.S.P. product of tragacanth—Mucilago Tragacanthae.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C411; 1936. Organic Plastics. This circular presents a summary of information assembled regarding those organic plastic materials which are of chief industrial significance, including the raw materials required, the chemical reactions involved, the various methods of processing, and the more important applications. The organic plastics are divided into four principal groups for discussion; namely, the synthetic resins, the natural resins, the cellulose derivatives, and the protein substances. Natural resins of animal, vegetable, and mineral sources are described. The chemistry of the cellulose esters and ethers and cellulose xanthate is outlined. The protein plastics considered include those prepared from casein, blood albumin, and soybeans,

U. S. Gov., Treasury Dept., Procurement Div., No. 481; 1941. Gum Arabic (Acacia). Covers three Classes—(A) granular; (B) lump; and (C) powder; intended for use primarily in photographic and lithographic work and as an adhesive. Gives requirements for water-insoluble residue, total ash, acid-insoluble ash, moisture, tannin-bearing gums, and starch and dextrin; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 598; 1943. Gum Arabic Solution (for) Offset Duplication. Covers one type and one grade intended for use as a "gum" and a protective coating for metal plates in the offset duplicating process. Shall be free from any objectionable odor and gives requirements for appearance and specific gravity; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-24; 1921. Gum; Arabic.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-15A; 1932. Acacia; Gum Arabic.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-16A; 1938. Gum Tragacanth.

220-229 CRUDE DRUGS AND ESSENTIAL OILS

221. CRUDE DRUGS OF VEGETABLE ORIGIN

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of the United States, 1941. Includes brief definitions of drugs and medicinal substances according to the tenets of homoeopathy; describes preparation processes of bringing crude drugs to the fluid and dry forms; gives requirements for forms of vehicles for prescription; includes practices in the writing of prescriptions; includes standards for the purity and quality of vegetable drugs; and lists several hundred drugs, mostly plant drugs, gives names and synonyms, description of plant, its habitat, the part used for drug purposes, the methods of preparation and standard strengths of tinctures, dilutions, medications, triturations, etc., as used in homoeopathic medicine

References.—Medicinal and pharmaceutical preparations, *see* 810-819.

222. DRUGS OF VEGETABLE ORIGIN OTHER THAN CRUDE

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Includes brief definitions of drugs and medicinal substances according to the tenets of homoeopathy; describes preparation processes of bringing crude drugs to the fluid and dry forms; gives requirements for forms of vehicles for prescription; includes practices in the writing of prescriptions; includes standards for the purity and quality of vegetable drugs; and lists several hundred drugs, mostly plant drugs, gives names and synonyms, description of plant, its habitat, the part used for drug purposes, the methods of preparation and standard strengths of tinctures, dilutions, medications, triturations, etc., as used in homoeopathic medicine.

References.—Medicinal and pharmaceutical preparations, *see* 810-819.

223. ESSENTIAL AND DISTILLED OILS

References.—Medicinal oils, *see* 813; vegetable oils, *see* 142.

230-239 DYEING AND TANNING MATERIALS OF VEGETABLE ORIGIN

231. TANNING MATERIALS

American Leather Chemists Assn. Methods of Sampling and Analysis. Beam House Liquors, 1942. Gives requirements for soak waters, lime liquors, and bate waters.

American Leather Chemists Assn. Methods of Sampling and Analysis. Chrome Tanning Materials, 1938. Gives requirements for one bath chrome liquor analysis (Provisional Method).

American Leather Chemists Assn. Methods of Sampling and Analysis. Vegetable Materials Containing Tannin. Revised, 1942. Gives requirements for sampling, analysis of raw and spent materials, analysis of extract, sugar in tanning materials, general, sheepskin skivers for color testing, analysis of liquor, and total acidity of liquors.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Tanning Materials, Tentative Methods. Preparation of solution, determination of total solids, soluble solids, insoluble solids, non-tannins, tannin, sugars, sulfite cellulose, for extracts and liquors; for raw and spent materials, determination of moisture, extracting and analysis of extract.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Divi Divi. Covers definition, derivation, grades, containers, uses, and substitutes.

References.—Synthetic tanning materials, *see* 809.1.

232. DYEING MATERIALS

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes recommendations for dye pads and method of preparing dyes for use with same for spotting department work in dry cleaning.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Annatto (Bixine). Covers definition, constants, solubility, derivation and characteristics, grades and forms, containers, uses, and substitutes.

References.—Coal-tar dyes, *see* 803.1.

233. EXTRACTS FOR DYEING

234. TANNING EXTRACTS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Myrobalans and Extract. Covers definition, derivation, grades, uses, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Quebracho Extract. Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

References.—Tanning materials, *see* 231.

240-249 SEEDS

(Except Oil Seeds and Spice Seeds)

240. GENERAL ITEMS

U. S. Dept. of Agriculture. Circular 480. Rules and Recommendations for Testing Seeds, July 1938. Adopted by the Assn. of Official Seed Analysts of North America. Gives rules for seed testing (standard analysis, evaluation, and reports) and includes recommendations for testing seeds.

241. ALFALFA, CLOVER, AND TIMOTHY SEEDS

242. GRASS SEEDS

243. FORAGE PLANT SEEDS

244. FLOWER SEEDS

245. CABBAGE AND TURNIP SEEDS

246. GARDEN SEEDS, EXCEPT CABBAGE AND TURNIPS

250-259 NURSERY AND GREENHOUSE STOCK

250. GENERAL ITEMS

251. BULBS AND ROOTS

259. MISCELLANEOUS NURSERY AND GREENHOUSE STOCK

American Assn. of Nurserymen. Horticultural Standards, 1940. Covers—deciduous trees, height, measurement, and grading tolerance; height of branching, caliper measurement, and height relationship to caliper of shade trees; and terms for deciduous trees for use other than as shade trees; deciduous shrubs, height measurements for dwarf and for strong growing shrubs, quality definitions, six classifications, and grading tolerance; vines, fast growing, medium growing, clump type, dwarf vines (ground cover), and plants in pots or containers; evergreens, quality definitions, five types of commercial evergreen grades (conifers), five types of commercial broad leaved evergreen grades, height measurement, and grading tolerance; rose grades, tea, hybrid tea and everblooming, rugosa and rugosa hybrids, hybrid perpetual, moss and miscellaneous bush, polyantha (baby roses), and climbing roses; fruit trees—grades, standard and dwarf apple, apricot, sweet and sour cherry, peach, standard and dwarf pear, plum, and quince; small fruit grades, raspberries, transplanted raspberries, blackberries, transplanted blackberries, currants, gooseberries, and grape vines: lining out stock; trees for forest planting, hardwoods and conifers; and recommended balling and burlapping specifications, minimum sizes of balls, ball depths, weight equivalent to ball sizes, and increased ball sizes for collected plants.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Cut Peonies in the Bud, 1938. Covers three grades—U. S. No.1, U. S. No.2, and unclassified. Gives requirements for each grade, tolerances, standards for bunching, and definitions of terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Asparagus Plumosus, 1930. Reissued, Mar. 1940. Covers three grades—U. S. Fancy, U. S. No.1, and U. S. Commercial. Gives requirements for each grade, sizes (corsage, short, medium, and long), and definitions of size and grade terms.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Tomato Plants, 1944. Gives requirements for grades, tolerances, standards for bunching, standards for packing, and definitions of terms.

260-269 TOBACCO

260. GENERAL ITEMS

261. TOBACCO, UNMANUFACTURED

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Tobacco. Natural order, synonyms, description, habitat, history, parts used, and preparation for tincture, dilutions, and medications for use in homoeopathic medicines.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Brief Classification of Leaf Tobacco (Covering Classes and Types of Tobacco), 1932. Class 1, flue cured types; class 2, fire cured types; class 3, air cured types; class 4, cigar filler types; class 5, cigar binder types; class 6, cigar wrapper types, miscellaneous types of domestic tobacco, and foreign types.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Official Standard Grades for Flue-Cured Tobacco (U. S. Types 11, 12, 13, and 14), Aug. 1936. Covers wrapper grades (A-group), leaf grades (B-group), cutter grades (C-group), lug grades (X-group), and nondescript and scrap (N- and S-groups); defines terms used; and gives grading rules.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Official Standard Grades for Fire-Cured Tobacco (U. S. Types 21, 22, 23, and 24), Dec. 1939. Covers wrapper grades (A-group), heavy leaf grades (B-group), thin leaf grades (C-group), short leaf or tips (T-group), lug grades (X-group), and nondescript and scrap (N- and S-groups); defines terms used; and gives grading rules.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Official Standard Grades for Burley Tobacco (U. S. Type 31), May 1938. Covers wrapper or fancy cutters and leaf grades (A-group), leaf and filler grades (B-group), lugs or cutters (C-group), granulators or flyers (X-group), and nondescript and scrap (N- and S-groups); defines terms used; and gives grading rules.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Official Standard Grades for Dark Air-Cured Tobacco (U. S. Types 35, 36, and 37), Jan. 1940. Covers wrapper grades (A-group), heavy leaf grades (B-Group), thin leaf grades (C-group), short leaf and tips (T-group), lug grades (X-group), and nondescript and scrap (N- and S-groups); defines terms used; and gives grading rules.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Miscellaneous Circular 83; 1926. U. S. Standard Tobacco Sizes. Gives requirements and application of sizes and description of sizing apparatus.

References.—Warehousing regulations, *see* 260.

262. MANUFACTURES OF TOBACCO

262.1 CIGARETTES

262.2 CIGARS

262.3 CHEWING TOBACCO

262.4 NICOTINE INSECTICIDES

References.—Nicotine insecticides, *see* 881.24.

280-289

STARCH AND VEGETABLE GLUE

281. STARCH

American Hospital Assn., 46-19. Laundry Starch. Covers one grade and two classes in four types. Based on U. S. Gov. Federal Specifications JJJ-S-701 for Laundry Starch, referred to below.

National Canners Assn. Method for the Examination of Starch for Thermophilic Bacteria. Covers preparation of sample, detection of flat sour spores, detection of thermophilic anaerobes not producing H_2S, detection of thermophilic anaerobes producing H_2S, reporting results, total thermophilic spore count, flat sour spores, thermophilic anaerobic spores, and sulfide spoilage spores.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerite of Starch. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Starch (Corn Starch). Description, solubility, identification, loss on drying, ash, reaction, iron, and storage. U.S.P. product of starch—Glyceritum Amyli.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M150; 1935. Suitability of Sweetpotato Starch for the Beater Sizing of Paper. In order to obtain information on the value of starch made from cull sweetpotatoes, a waste farm product, as beater sizing for paper, twenty-six paper-machine runs were made in the Bureau's semicommercial mill. In this work, sweetpotato starch was used in comparison with high-grade commercial starches made from corn and cassava. The relative merits of the different starches used were determined by comparing the results obtained with respect to retention of starch, retention of mineral filler, and properties of the finished papers.

U. S. Gov., Federal Specification JJJ-S-701; 1933. Starch; Laundry, Covers four types, one grade, fine and lump. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 51C29a; 1943. Chemicals; Testing, Dissolved-Oxygen.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-99; 1941. Starch; Potato.

References.—Cornstarch, *see* 103.3.

282. VEGETABLE GLUE

U. S. Gov., Army Air Forces. Specification 14124; 1944. Glue; Low-Temperature-Setting Resin (Phenol, Melamine, and Resorcinol Base).

U. S. Gov., Army-Navy Aeronautical Specification AN-G-8; 1942. Glue; Cold-Setting Resin.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-20-1; 1943. Glue; Application of Cold-Setting Resin.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-G-486-1; 1942. Glue; Aviation-Marine, Waterproof.

U. S. Gov., Federal Specification C-G-496; 1944. Amendment 1; 1944. Glue; Resin-Type, Liquid and Powder. Covers one grade and three types—(I) powder, with separate catalyst; (II) powder, with incorporated catalyst; and (III) liquid, with separate catalyst. Gives requirements for mixing, caking of powder glue, mixing properties, pH value of set film, filler, catalyst, working life, block shear strength, and plywood shear strength; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-169; 1940. Glue; Vegetable.

References.—Glue of animal origin, *see* 093; mucilage made from gum acacia, *see* 932.5.

290-299

MISCELLANEOUS VEGETABLE PRODUCTS

291. IVORY, VEGETABLE, OR TAGUA NUTS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Ivory Nut. Covers definition, characteristics, uses, derivation, shipping, and substitutes.

292. MOSS, SEAWEED, AND VEGETABLE SUBSTANCES

U. S. Gov., Treasury Dept., Procurement Div., No. 563; 1942. Peat (Moss, Reed, and Sedge). Covers: Type I—Moss Peat—class A, horticultural grade (fine shreds); class B, poultry litter (medium shreds); class C, stable bedding (coarse shreds); Type II—reed muck or sedge muck; Type III—reed peat or sedge peat—class A, acid grade; class B, nearly neutral grade. Gives requirements for acidity, moisture content, water holding capacity, coarseness classification of shreds, and ash; methods of sampling, inspection, and test; and packaging, packing, and marking.

293. FIBER SPONGES

American Hospital Assn., 34-130. Cellulose Sponges. Covers coarse and fine pore types. Based on U. S. Gov., Treasury Dept., Procurement Div. Specifications 304 C for Cellulose Sponges.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Loofa Sponges (Vegetable Sponge). Covers definition, derivation and characteristics, uses, grades, and substitutes.

U. S. Gov., Federal Specification L-S-626; 1943. Amendment 3; 1944. Sponges; Cellulose-Type. Covers two types—(I) coarse pore and (II) fine pore (for rectangular-shape only). Gives requirements for material, workmanship, shapes, dimensions, and chemical and physical requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 13S7b; 1943. Sponges; Loofa.

294. BROOM CORN

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Broomcorn. Covers definition, characteristics, derivation, uses, packing, marketing, and substitutes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. U. S. Standards for Broomcorn, effective Mar. 1, 1931. Gives definitions, and requirements for quality—A, B, C, and D; grades—choice, good, medium, common, sample; classes—whisk, parlor, warehouse; and divisions—hurl, self-working, and underwork.

295. WAX

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Candelilla Wax. Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Carnauba Wax (Brazil Wax). Covers definition, derivation, constants, solubility, uses, grades, packing and marketing, and substitutes.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-503-115A; 1936. Wax; Carnauba.

296. INSULATING MATERIALS-ELECTRICAL THERMAL

296.0 GENERAL ITEMS

296.1 ELECTRICAL INSULATING MATERIALS

References.—Electrical insulating materials, *see* 719.5.

296.2 THERMAL INSULATING MATERIALS

American Society for Testing Materials, C165-41T; 1941. Tentative Methods of Test for Compressive Strength and Flexural Strength of Preformed Block Type Thermal Insulating Materials. Apparatus, test specimens, procedure, calculations, and report.

American Society for Testing Materials, C166-41T; 1941. Tentative Methods of Test for Covering Capacity and Volume Change Upon Drying of Thermal Insulating Cement. Definitions, apparatus, sampling and preparation of test specimens, procedure, and calculations.

American Society for Testing Materials, C167-44; 1944. Methods of Test for Thickness and Density of Blanket Type Thermal Insulating Materials. The procedures for determining the thickness and density of flexible, felted or woven thermal insulating blanket, rolls, or batts, with or without reinforcement, composed of fibrous materials. Covers apparatus, test specimen, procedure, calculations, and report.

American Society for Testing Materials, C168-44, 1944. Definitions of Terms Relating to Thermal Insulating Materials. Defined preformed thermal insulating block and thermal insulating cement.

American Society for Testing Materials, C193-44T; 1944. Tentative Specification for 85 percent Magnesia Thermal Insulating Cement. Covers scope, composition, physical properties, sampling and mixing, methods of testing, and rejection.

American Society for Testing Materials, C194-44T; 1944. Tentative Specification for Asbestos Thermal Insulating Cement. Covers scope, composition, physical properties, sampling and mixing, methods of testing, and rejection.

American Society for Testing Materials, C195-44T; 1944. Tentative Specification for Mineral Wool Thermal Insulating Cement. Covers scope, physical properties, sampling and mixing, methods of testing, and rejection.

American Society for Testing Materials, C196-44T; 1944. Tentative Specification for Expanded or Exfoliated Vermiculite Thermal Insulating Cement. Covers scope, physical properties, samples and mixing, methods of testing, and rejection.

American Society for Testing Materials, C197-44T; 1944. Tentative Specification for Diatomaceous Silica Thermal Insulating Cement. Covers scope, physical properties, sampling and mixing, methods of testing, and rejection.

American Society for Testing Materials, ES-14; 1942. Emergency Specifications for Blanket Thermal Insulation for Building Purposes. Cover blanket or batt thermal insulating materials furnished in flexible or semirigid form and suitable for building purposes for application to flat or curved surfaces.

American Society for Testing Materials, ES-15; 1942. Emergency Specifications for Blanket Thermal Insulation for Industrial Purposes. Cover blanket insulating materials furnished in flexible or semirigid form and suitable for industrial purposes for application on flat or curved surfaces where surface temperatures exceed 100° F.

American Society for Testing Materials, ES-16; 1942. Emergency Specifications for Blanket Thermal Insulation for Refrigeration Purposes. Cover blanket thermal insulating materials furnished in flexible or semirigid form and suitable for refrigeration purposes for application on flat or curved surfaces.

American Society for Testing Materials, ES-17; 1942. Emergency Specifications for Preformed Pipe Covering Thermal Insulation. Cover preformed (molded or laminated) thermal insulation in the form of semicylindrical pipe covering sections intended for use as an insulation on surfaces at specified temperatures.

American Society for Testing Materials, ES-18; 1942. Emergency Specifications for Preformed Block Thermal Insulation. Cover a rigid or semirigid thermal insulating material, either flat or segmental, for application as received, and excluding brick of the 9-in. series.

American Society for Testing Materials, ES-19; 1942. Emergency Specifications for Structural Insulating Board (Thermal Insulation). Cover thermal insulating material made principally of vegetable fiber in the form of insulating board suitable for structural purposes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Insulation; Heat, Cold, and Sound. Gives the general definition and characteristics and describes six different kinds—(I) fiberboard insulation; covers grades and classes, commercial standards, specifications, uses, and ordering instructions; (II) corkboard; covers definition, characteristics, specifications, and uses; (III) asbestos board; covers definition, characteristics and forms available, uses, packing, and marketing; (IV) blanket insulation; covers definition, characteristics and forms available, uses, and specifications; (V) loose-fill insulation; covers definition, constants, containers, uses, and ordering instructions; and (VI) reflective insulation; covers definition, characteristics, and specifications. The definition and specifications for acoustical treatments for sound absorption and sound correction are also given.

U. S. Gov., Army Air Forces. Specification 17013; 1940. Paper—Bats.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS42-43; 1943. Structural Fiber Insulating Board. Sponsored by the Insulation Board Institute. Gives five classes—(A) building board, (B) lath (for plaster base), (C) roof insulation board, (D) interior board (factory finished), and (E) sheathing. Covers physical requirements and tests for thermal conductivity, strength, absorption, and expansion; sets forth the standard commercial sizes, tolerances; method of sampling and testing; and packing and labeling.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS105-43; 1943. Mineral Wool; Loose, Granulated, or Felted Form, in Low-Temperature Installations. To establish minimum specifications for insulating low-temperature areas with mineral wool for the guidance of manufacturers, distributors, installers, contractors, and users. Gives requirements for material, construction, refrigerated spaces, and pipe lines.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS117-44; 1944. Mineral Wool; Blankets, Blocks, Insulating Cement and Pipe Insulation for Heated Industrial Equipment. To establish minimum specifications for insulating heated surfaces with mineral wool products and provides minimum requirements for mineral wool blankets, blocks, insulating cement, and pipe insulation for insulating heated industrial equipment. Gives general requirements; detail requirements including blanket insulation, block insulation, insulating cement, and pipe insulation (blanket-type and molded-type); recommended installation requirements including auxiliary material, application, blanket insulation, block insulation, insulating cement, and pipe insulation (blanket-type and molded-type); guides for painting, maintenance, and guarantee labels and certificates.

U. S. Gov., Federal Specification HH-I-521b; 1937. Insulation; Bat or Strip-Form and Loose Fill. Type (I) bat or strip form—two classes—(A) light-weight, (B) medium-weight; and (II) loose-fill form—three classes—(A) light-weight, (B) medium-weight, and (C) heavy-weight. Composed of mineral matter in fibrous form, in granular form, in nodulated fibrous form, in powdered form mixed with cellulose fiber, or in bat form. Gives requirements for materials, sulfur, oil asphalt, wax conductivity, and density; methods of sampling, inspection, and tests; requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-I-528; 1944. Insulation; Cotton, Batts. Covers one grade and three classes—(a) without backing, (b) backing on one side with moisture-resistant paper, and (c) backing on both sides (one side moisture-resistant paper). Gives requirements for material, workmanship, construction, fire resistance, backing, length and width, thickness, weight, and thermal conductivity; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-I-556; 1941. Insulation (Glass-Fiber); Semirigid. Covers one grade and four types—(I) standard thickness, pipe covering; (II) double standard thickness, pipe covering; (III) single layer, pipe covering; and (IV) block. Gives requirements for material and workmanship, construction, weight per cubic foot, thicknesses, and finish; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-I-578; 1941. Insulation; Vermiculite, Block and Pipe-Covering (Molded). Covers four types—(I) standard thickness, pipe-covering; (II) double standard thickness, pipe-covering; (III) solid thickness, pipe-covering; and (IV) block. Expanded or exfoliated mica, long fiber asbestos, and a suitable binder. Gives requirements for materials, weight, size, thickness, covering, and bands; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-I-578; 1942, deletes use of brass bands and changes their width and thickness.

U. S. Gov., Federal Specification HH-M-61; 1934. Magnesia; Block, Cement, and Pipe-Covering (Molded). Covers one grade and four types—(I) standard thickness, (II) double standard thickness, (III) blocks, and (IV) cement or plaster. Shall contain not less than 85 percent of pure hydrated magnesium carbonate and not less than 10 percent long-fiber asbestos. Gives requirements for weight, length, thickness, size, cotton sheeting jacket, and bands; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternated Federal Specification E-HH-M-61; 1942, changes requirements for cotton sheeting jacket; and deletes use of brass bands and changes their width and thickness.

U. S. Gov., Federal Specification HH-M-371; 1938. Mineral-Wool; Impregnated, Blanket, Block, and Pipe Covering (Molded), (for Low Temperatures). Includes five types—(I) molded block; (II) molded sectional pipe covering, ice water thickness; (III) molded sectional pipe covering, brine thickness; (IV) molded sectional pipe covering, heavy brine thickness; and (V) felted blanket. Gives detail requirements for material, workmanship, conductivity, and density; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-M-371; 1942, substitutes ordinary steel in lieu of copperized staples and copper-clad steel wire.

U. S. Gov., Federal Specification HH-P-386a; 1939. Pipe-Covering and Cement; Mineral or Rock-Wool. Covers one grade and three types—(I) molded sectional pipe covering, (II) felted blanket pipe covering, and (III) cement. Gives requirements for material and workmanship, sulfur shot, stability, thicknesses, tolerance, and density; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-P-386a; 1942, changes requirements for cotton sheeting jacket; and deletes use of brass bands and changes their width and thickness.

U. S. Gov., Federal Specification LLL-I-533; 1943. Insulation (Redwood-Bark, Shredded). Insulation shall be furnished in but one grade and the following class: Class A—loose fill. Gives requirements for material, workmanship, thermal conductivity, density, moisture content, settlement, flame-resistance, odor, adulteration, impurities, sampling, inspection, tests, packing, and marking.

U. S. Gov., Navy Dept. Specification 32C14g; 1944. Cement; Insulation, High-Temperature.

U. S. Gov., Navy Dept. Specification 32C15d; 1944. Cloth, Tape, and Thread; Glass, Fibrous (for Lagging Insulation).

U. S. Gov., Navy Dept. Specification 32 F 4; 1943. Felt; Insulating, Mineral.

U. S. Gov., Navy Dept Specification 32G2c; 1942. Glass: Fibrous, Insulating.

U. S. Gov., Navy Dept. Specification 32 G 3b; 1943. Glass; Fibrous, Stitched on Flameproofed Fabric.

U. S. Gov., Navy Dept. Specification 32G4; 1940. Grog; Insulating, Granular, Calcined.

U. S. Gov., Navy Dept. Specification 32-I-3a; 1944. Insulation; Thermal, Block.

U. S. Gov., Navy Dept. Specification 32 T 1c; 1943. Tape; Insulating, Thermal.

U. S. Gov., Navy Dept. Specification 32 T 2; 1943. Tape; Impregnated (Gasket Material for Heat Insulation).

U. S. Gov., U. S. Maritime Commission. Specification 32-MC-1; 1941. Insulation; Mineral Wool, Blanket Type. Shall be mineral wool felt, blanket form, without covering. Gives requirements for material and workmanship, thickness, density, fire-retardant properties, resistance to corrosion, resistance to bacteria, integrity, miscellaneous properties, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 32-MC-2; 1941. Insulation; Mineral Wool, Block Type, for Use Below 225° F. Shall be mineral wool felt in block form, with or without moisture-repellant treatment. Gives requirements for material, workmanship, construction, surfaces, dimensions, edge finish, fire-retardant properties, resistance to corrosion, resistance to bacteria, resistance to moisture, miscellaneous properties, sampling, inspection, and tests.

References.—Paper, *see* 473.3, 518.0; cement, *see* 516.0; pipe covering, *see* 707.4.

296.3 PLASTIC INSULATING MATERIALS

References.—Plastic insulating materials, *see* 893.1; plastics, *see* 846.5; molded and laminated, *see* 719.58; glass cloth, *see* 528.

296.4 ACOUSTICAL INSULATING MATERIALS

Acoustical Society of America, sponsor. Approved by American Standards Assn. as Z 24.1-1942. Acoustical Terminology. Includes terminology relating to sound, architectural acoustics, hearing, sound transmission, transmission systems, and music.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Insulation; Heat, Cold, and Sound. Gives the general definition and characteristics and describes six different kinds—(I) fiber board insulation; covers grades and classes, commercial standards, specifications, uses, and ordering instructions; (II) corkboard; covers definition, characteristics, specifications, and uses; (III) asbestos board; covers definition, characteristics and forms available, uses, packing, and marketing; (IV) blanket insulation; covers definition, characteristics and forms available, uses, and specifications; (V) loose-fill insulation; covers definition, constants, containers, uses, and ordering instructions; and (VI) reflective insulation; covers definition, characteristics, and specifications. The definition and specifications for acoustical treatments for sound absorption and sound correction are also given.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-32-1; 1944. Soundproofing Materials.

References.—Acoustical plaster, *see* 514.65.

296.9 MISCELLANEOUS INSULATING MATERIALS

U. S. Gov., Navy Dept. Specification 52C22; 1944. Cement; Adhesive, Insulation, Fibrous.

U. S. Gov., Treasury Dept., Procurement Div., 261A; 1940. Adhesives; Acoustic Material. A wide range in the selection of raw materials and processes of manufacture are given. The cement shall be free from all ingredients which might affect the serviceability thereof or have a deleterious affect upon the acoustic material. Gives requirements for stresses, plasticity, waterproof, and alkali resistant; methods of sampling, inspection, and tests; and packaging, packing, and marking.

300-399 TEXTILES

300-309 COTTON, COTTON FABRICS, AND KNIT GOODS

300. GRADES, DEFINITIONS, AND TESTS OF COTTON

300.0 GENERAL ITEMS

National Assn. of Dyers and Cleaners of the U.S. and Canada. Identification of Fibers, T-145, 1944. For training employees in the identification of textile fibers. Covers natural fibers and synthetic fibers. Gives method of testing and tests for fiber content of pure silk, weighted silk, wool, cotton, regenerated rayon, cellulose acetate rayon, nylon, vinyon, aralac casein, and glass.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cotton. Covers definition, derivation, characteristics and types, uses, marketing, grades, packaging and substitutes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Miscellaneous Publication No. 310; 1938. The Classification of Cotton. Gives nature of cotton and basis of its classification, general practices in sampling and the care and handling of samples, factors of grade, standards for grade, the determination of grade, method of grading irregular and special-condition cotton, inaccuracies in grading cotton, factors of staple and the standards of staple, method of stapling, common errors in stapling, factors of character, effect of moisture on staple and character, relation of classification to prices, and official cotton standards of the U. S. in effect May 1938.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcements No. 117; 1929. Proceedings of International Universal Cotton Standards Conference of 1929 and Items Relating to the Administration of the U. S. Cotton Futures and Cotton Standards Acts. Covers International Universal Cotton Standards Conference of 1929, revision of standards for American Egyptian cotton, revision of standards for extra white cotton, tentative standards for preparation of long-staple cotton, amendments of staple standards, southern delivery on futures contracts of the New York Cotton Exchange, opinions and letters of general interest to the cotton industry, act relating to investigation of new uses of cotton, and excerpt from the appropriations act approved 1929.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 146; 1934. Items Relating to the Administration of the U. S. Cotton Standards and Cotton Futures Act. Covers licensing of cotton samplers, International Universal Cotton Standards Conferences of 1931 and 1933, revision of standards of extra white cotton, half grades of American Egyptian cotton, determinations of staple length, sample standards, sample premiums, preparation of long staple cotton, excerpts from letters of general interest, joint resolution to provide additional facilities for classification and for licensing of samplers, and excerpts from appropriations act approved 1934.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 153. Regulations of the Secretary of Agriculture Under the U. S. Cotton Standards Act, effective Aug. 20, 1936, and Amendments 1, 1938; 2, 1939; and 3, 1940. Includes definitions, classifications, sample or type comparison, reviews, supervision of transfers of cotton, licensed classifiers, licensed samplers, and appendices; official cotton standards, American cotton linters, adjustment of disputes.

References.— Lime for use in textile industry, *see* 517.2; coal-tar dyes, *see* 803.1.

300.1 U. S. STANDARDS FOR GRADES OF COTTON

New England Cotton Buyers Assn. Accepted by National Assn. of Cotton Manufacturers and American Cotton Shippers Assn. New England Terms for Buying and Selling American Cotton (except Sea Island and American Grown Egyptian Cotton), 1944. Defines short staple and long staple cotton. Gives details for sampling, classifying, claims, etc.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Miscellaneous Publication No. 310; 1938. The Classification of Cotton. Gives nature of cotton and basis of its classification, general practices in sampling and the care and handling of samples, factors of grade, standards for grade, the determination of grade, method of grading irregular and special-condition cotton, inaccuracies in grading cotton, factors of staple and the standards of staple, method of stapling, common errors in stapling, factors of character, effect of moisture on staple and character, relation of classification to prices, and official cotton standards of the U. S. in effect May 1938.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcements No. 92; 1925. Standards for Cotton Classification in the U. S. and Abroad. Gives official cotton standards of the U. S. for grades and colors of American upland cotton, and American Egyptian Cotton, for length of staple, and for American cotton linters. Covers distribution of official cotton standards, American cotton in export trade, agreement between Dept. of Agriculture and European cotton associates and exchanges, supplement agreement, and appendix showing U. S. cotton standards act.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 94; 1925. Official Standards of the U. S. for American Cotton Linters. Includes definitions for grades 1 to 7, hull fiber, compound grades, mixed packed, and extraneous matter; and discusses cotton hair, residual fibers, robust and flaccid hairs, cutting linters, the reasons for cutting linters, and request for standard grades.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 109; 1928. Items Relating to the Administration of the U.S. Cotton Futures and Cotton Standards Acts. Includes standards for color for American cotton linters. Definitions of seven color grades as embraced in the colors of the samples composing official standards of U.S. for Cotton linters.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcements No. 117; 1929. Proceedings of International Universal Cotton Standards Conference of 1929 and Items Relating to the Administration of the U. S. Cotton Futures and Cotton Standards Acts. Covers International Universal Cotton Standards Conference of 1929, revision of standards for American Egyptian cotton, revision of standards for extra white cotton, tentative standards for preparation of long-staple cotton, amendments of staple standards, southern delivery on futures contracts of the New York Cotton Exchange, opinions and letters of general interest to the cotton industry, act relating to investigation of new uses of cotton, and excerpt from the appropriations act approved 1929.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 146; 1934. Items Relating to the Administration of the U.S. Cotton Standards and Cotton Futures Act. Covers licensing of cotton samples. International Universal Cotton Standards Conferences of 1931 and 1933, revision of standards of extra white cotton, half grades of American Egyptian cotton, determinations of staple length, sample standards, sample premiums, preparation of long staple cotton, excerpts from letters of general interest, joint resolution to provide additional facilities for classification and for licensing of samplers, and excerpts from appropriations act approved 1934.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 150; 1936. Revision of Standards for Grades of American Upland Cotton. Covers universal cotton standards, revised, effective Aug. 20, 1936; classification according to the new standards; public notice establishing official cotton standards; and attendance at meetings in 1935 to consider revision of standards.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 153. Regulations of the Secretary of Agriculture Under the U. S. Cotton Standards Act, effective Aug. 20, 1936, and Amendments No. 1, 1938; No. 2, 1939; and No. 3, 1940. Includes definitions, classifications, sample or type comparison, reviews, supervision of transfers of cotton, licensed classifiers, licensed samplers, and appendices; official cotton standards, American Cotton linters, adjustment of disputes.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcements No. 163; 1942. Developments in Cotton Standardization and Related Services. Covers International Universal Cotton Standards Conferences of 1936 and 1939, standards for sea-island cotton, standards for American Egyptian cotton, preparation of standards for long-staple cotton, symbols for grade designations for American upland cotton, some reasons for variations in classification of cotton, public cotton classifying service, changes in contracts for future delivery, classing the market news services for organized cotton-improvement groups, cotton fiber testing service, and excerpt from appropriations act approved 1942.

References.—Laws and regulations establishing cotton grades, *see* 300.0.

300.4 GENERAL METHOD OF TESTING COTTON FABRICS

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determination of Copper and Iron in Textiles. Standard method of test covering preparation of sample, standard copper solution, method of procedure, and an alternative method for copper and iron.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determination of Degree of Mercerization of Cotton. Standard method of test covers barium activity numbers, cleaning of sample and standard unmercerized cotton, method of procedure, and computation of the barium activity number.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determining of Finishing Materials in Textile Fabrics. Proposed Method. The practice of textile finishing involves the use of an exceedingly great number of substances which are used alone or in combination with each other. Covers general scheme including petroleum ether soluble, alcohol soluble, water soluble, starches, and ash.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determination of Manganese in Textiles. Standard method of test covers preparation of samples, outline of procedure, and standard permanganate solutions for comparison.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determination of Shrinkage of Textiles. This official method for determining shrinkage in washable woven cotton fabrics covers preparation of sample, standard load, soap solution, washing, drying, pressing, and calculation of results, also includes tentative method for determining the shrinkage of fabrics other than cotton.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determination of Transference of Color. Tentative Method of Test. Includes hot pressing (dry) for color change, mark-off for wet and dry pressing, rubbing (crocking) for wet and dry tests in the standard crock meter, sublimation of transference caused by pressure during storage, transference during bleaching of colored striped material, with classification of materials according to resistance to tests.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determination of Water Resistance of Fabrics. Defines shower resistance and rain resistance in terms of hydrostatic pressure and time. Describes hydrostatic pressure test, spray test, and immersion test with illustrations of apparatus set-up.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determination of Weighting in Silk. Standard method of test covers weighing of dried sample, method of procedure, reagents required, and computation of percentage of weighting.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Evaluation of Compounds Designed To Increase the Resistance of Fabrics and Yarns to Insect Pests. Tentative Method. It comprehends not only the initial protection furnished by the treatment in question, but also the permanency of this protection during conditions of ordinary use. Covers test specimen, procedure, cleaning, and classification.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Evaluation of Wetting Agents. Method of finding the concentration of wetting agent that is required to cause sinking of 5-gm. skein of unboiled, grey, 2-ply cotton yarn carrying a standard weight in a solution of the agent in pure water. Also applicable to the determination of the wettability of yarns and threads.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Fastness to Acids and Alkalies. Covers tests for change of shade when dyed material comes in contact with acid fumes, acid sizes, etc., but does not necessarily cover change in shade which might take place in carbonizing, cross dyeing, acid milling, and acid perspiration. Gives tests for dyed cotton; fastness to alkalies, for dyed cotton, and dyed wool.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Fastness to Atmospheric Gases of Dyes on Cellulose Acetate Rayon. Tentative Method. Gives requirements for preparation of test specimen, apparatus, method of procedure, and evaluation of result.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Fastness to Carbonizing. Describes official method for laboratory tests for fastness to carbonizing with acid and with aluminum chloride.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Fastness to Dry Cleaning. Tentative Method. Covers test specimens, apparatus, solvent, volume, temperature, dry cleaning procedure, hand pressing, steam pressing, steaming, wet cleaning procedure, classification, test controls, caution, and explanatory notes.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Fastness to Light of Textiles. This standard method is intended as a basis for mutual understanding between manufacturers of dyestuffs, dyers and printers of textiles, and purchasers of the dyed and printed fabrics or yarns as to the fastness to light of dyed textiles. Covers test specimen, standard dyeings, apparatus and testing conditions, method of procedure, and classification.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Fastness to Perspiration of Dyed Textiles, Standard (official method) procedures for determining resistance to perspiration and interpretation of results.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Fastness to Rubbing (Crocking). Covers damage to other fabrics, not the fabric tested, by rubbing off of various colored substances from the fabric in question onto other fabrics so as to soil or stain them, usually onto white. Description of special crockmeter, dyeing method, and reference samples prepared by the association.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Fastness to Sea Water. This standard method is mainly applicable to goods made of silk or wool which are to be used for flags, bunting, or bathing suits; requirements for strength of salt water solution, method of procedure, and comparison with uncolored swatches.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Group C—Fastness Tests for Dyed or Printed Cotton and Linen. Standard methods of test for colorfastness to commercial laundering and to domestic washing of cotton and linen textiles; fastness to fulling of dyed cotton against white cotton, silk and wool; fastness to chlorine of dyed or printed cotton; and fastness to stoving.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Group R—Fastness Tests for Dyed or Printed Rayons. For acetate rayons and regenerated cellulose rayons (viscose, nitro, and cuprammonium types). Standard methods of test for fastness to laundering and domestic washing of dyed or printed rayon (official method), preparation of sample, tests, and classification.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Group S—Fastness Tests for Dyed or Printed Silk. Standard methods of test for fastness to washing of dyestuffs on silk using launder-ometer (official method), fastness to fulling, fastness to degumming, fastness to stoving, and fastness to peroxide bleaching, preparation of sample, test procedure, and classification with table of values of fastness with respect to color change, staining of white cotton, wool, and silk.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Group W—Fastness Tests for Dyed Wool. Standard methods of testing of fastness to laundering and domestic washing of dyed wool (official method) using launder-ometer, fastness to fulling, scouring, and mill washing, fastness to dry and wet heat (sponging and pressing) in respect to bleeding, fastness to stoving, preparation of sample, test procedures, and classification of materials for alteration of color and loss under test, and for staining of other fibers.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Identification of Finishing Materials. For the identification and determination of individual constituents. Covers oils, fats and waxes, naphthenic sulfonates, solubilized oils and fats, rosin, glycerin and glycols, albumen casein, glue and gelatin, dextrin, starch, sugars, inorganic fillers, and urea-formaldehyde resin.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Launder-Ometer. Standard laundry machine for laboratory washing tests for testing fastness of dyed textile materials. Consists of a copper tank on angle iron frame, with a special brass and aluminum rotor operating at a specified speed, rubber or metal abrasive balls, and tank heater.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Methods of Fiber Identification and Quantitative Separation. Covers burning test, color test, solubility tests, and microscopic examination; classifies fibers as mineral, cellulose, and protein; methods of procedure, qualitative analysis, microscopic appearance of hairs and bast fibers, quantitative analysis, microscopic appearance of artificial fibers, and quantitative analysis of fiber mixtures.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Standard Methods for Determining the Fastness of Dyestuffs on the Fiber. These methods are classified in groups: Group C—dyed or printed cotton, Group R—dyed or printed rayons, Group S—dyed or printed silk, and Group W—dyed wool. For each group is given numbered fastness tests for that fiber, such as laundering and domestic washing, fulling, chlorine, stoving, degumming, peroxide bleaching, dry and wet heat (sponging and pressing) as applicable. Also indicates the methods for fastness, sizing and finishing, waterproofing, shrinkage, transference of color, moth proofing, mercerization, weighting tests, etc. Refers to standard dyed samples for use in grading of which have been prepared by the assn.

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Test for Resistance of Fabrics and Yarns to Insect Pests. For testing of fabrics which contain wool or other hair fibers for resistance to moths and carpet beetles. Covers test specimens, excrement weight method, fabric loss method, a tentative procedure for rearing and handling the black carpet beetle, and tentative procedure for rearing and handling the webbing clothes moth.

American Society for Testing Materials, D 39-39; 1939. American Standards Assn., L5-1939. General Methods of Testing Woven Textile Fabrics. Includes standard condition for test, dimensions, and weight determinations, width and thickness, count, crimp, breaking strength, elongation, tearing strength, twist, and bow, test specimen, apparatus, and procedures.

American Society for Testing Materials, D 231-39; 1939. Methods of Testing and Tolerances for Knit Goods. For those classes of knit goods which later enter into manufacturing processes; tolerances for width, weight, and count; bursting strength, test specimen, standard conditions, apparatus and test procedures; moisture regain, grease determination, and percentage of cotton and wool. A.S.T.M. Emergency Alternate Provision, EA-D 231; 1944, affected section 13, grease determination.

American Society for Testing Materials, D 274-36, 1936. Methods of Testing and Tolerances for Certain Light and Medium Weight Cotton Fabrics. For three classes—(A) airplane wing fabric, balloon cloth, osnaburg, etc.; (B) broadcloth, buckram, bunting, carded lawns, clothing twills, cotton flannel, denims, drills, four leaf, twills, print cloth, sateens, sheeting, etc.; and (C) blanket cloths; tolerances permitted; and tests using A.S.T.M. methods D 39, D 433, and D 437 as applicable.

American Society for Testing Materials, D 276-43T; 1943. Tentative Methods for Identification of Fibers in Textiles. Covers procedures for the identification of textile fibers used commercially in woven, knit, or braided fabrics. Gives reference samples, reagents, apparatus, considerations for sampling, test specimens, mounting specimens, preliminary examination, procedures for various types of fibers, and enlarged photographs of various fibers.

American Society for Testing Materials, D 354-41; 1941. American Standards Assn., L13.1-1942. Methods of Testing and Tolerances for Tubular Sleevin^ and Braids. Tolerances and methods of testing.

American Society for Testing Materials, D 377-37; 1937. Method of Test for Colorimetric Determination of Small Amounts of Copper and Manganese in Textiles. Where copper and manganese content is less than .01 percent, samples, blank tests, reagents, and procedures for determinations by ashing and analysis.

American Society for Testing Materials, D 414-40T; 1940. Tentative General Methods of Testing Cotton Fibers. For determination of fiber length, length distribution, fineness, percentage of thin-walled fibers, strength, and cross-sectional features of loose cotton fibers, whether unprocessed or prepared from cotton products. Covers standard conditions, preparation of specimen, accessories for length, weight fineness, immaturity, tensile strength, cross-sections, nappiness, with test procedures and records.

American Society for Testing Materials, D 433-39; 1939. Methods of Testing and Tolerances for Certain Carded Cotton Gray Goods. Includes broadcloth, buckram, bunting, carded lawns, cotton flannel, denims, drills, osnaburg, pajama checks, print cloths, sateens, sheeting, twills, etc., requirements for sampling, standard condition, tolerances in yardage, selvage, width, count, and weight, with tests for width, count, weight, and other tests using A.S.T.M. method D 39.

American Society for Testing Materials, D 435-42; 1942. Method of Test for Colorfastness to Commercial Laundering and to Domestic Washing of Cotton and Linen Textiles. Applicable to all colored cotton and linen textiles, whether dyed or printed, and deals only with the fastness of the color to laundering or domestic washing without the aid of a bleaching agent. Apparatus, standard dyeings, test specimens, soap solution, procedure, and classification of fastness to washing. This standard method is based upon the method developed by the Research Committee of the American Assn. of Textile Chemists and Colorists.

American Society for Testing Materials, D 437-36; 1936. American Standards Assn., L10-1936. Method of Test for Shrinkage in Laundering of Woven Cotton Cloth. Includes requirements for washing machines, test sample, standard load, soap solution, washing procedure, drying, pressing, and results.

American Society for Testing Materials, D 463-37T; 1937. Tentative Method of Test for Volumetric Determination of Small Amounts of Copper in Textiles. Where copper is less than 0.01 percent but greater than 100 micrograms, requirements for sampling, blank determinations, reagents, and test procedure.

American Society for Testing Materials, D 506-41; 1941. Method of Test for Colorfastness of Colored Textiles to Light. Applicable to all colored textiles and is intended for determining the fastness of the color to sunlight or artificial light. Apparatus, standard dyeings, test specimens, procedure, and classification of fastness of color. This method of test is based upon the method developed by the American Assn. of Textile Chemists and Colorists.

American Society for Testing Materials, D 539-40T; 1940. Tentative Method of Test for Apparent Fluidity of Dispersions of Cellulose Fibers in Cuprammonium Hydroxide. Measure of degradation due to light, acids, alkalies, and oxidizing agents in processing, in laundering, and use; applicable to scoured or bleached cotton and regenerated cellulose rayon textiles which give apparent fluidities of 45 rhes or less. Viscosimeter, reagent storage and analysis, and sample and test.

American Society for Testing Materials, D 583-40 T; 1940. Tentative Methods of Test for Resistance of Textile Fabrics to Water. Includes hydrostatic pressure, water penetration (drip), and water absorption (spray) methods. Test liquid, apparatus, specimen, and methods of procedure.

American Society for Testing Materials, D 629-42T; 1942. Tentative Methods of Quantitative Analysis of Textiles. Describe procedures for the quantitative analysis of textiles for water, total nonfibrous materials, acetate rayon, silk (including silk noils), regenerated cellulose rayon, cotton, and wool (including reprocessed and reused wool), and varieties of these kinds of fibers in mixtures. Types of analysis, general procedure, moisture content or moisture regain, total sizing, finishing, and other nonfibrous materials; mechanical separation or dissection, chemical analysis, and comparative scale for fineness of various textile fibers.

American Society for Testing Materials, D 679-44; 1944. Methods of Testing Tolerances for Certain Fine Staple Cotton Gray Goods. Methods of testing and tolerances apply to the following fine staple cotton gray goods—combed broadcloth, lawns, longcloths, organdies, oxfords, pongees, poplins, voiles, piques, bedford cords woven on plain looms, and sateens and twills all or partly combed. Gives tolerances for yardage, width, weight, warp count, and filling count; and methods of testing.

American Society for Testing Materials, D 680-44; 1944. Methods of Testing and Tolerances for Certain All-Cotton and Cotton-and-Rayon Fine Fancy Goods. Apply to combed handkerchief cloths, plain combed staples using color in warp or filling; piques and bedford cords woven on dobby looms; other dobby and jacquard weaves, carded or combed; combed shirtings, dress goods, and goods of cotton and rayon mixed yarns manufactured to purchase specifications.

American Society for Testing Materials, D 683-42T; 1942. Tentative Methods of Test for Identification of Finishes on Textiles. Cover the qualitative procedures for the identification of the following finishes on cotton textiles—urea-formaldehyde resin finishes, straight formaldehyde finishes, alkyd resin finishes containing phthalates, polymerized ethylene derivative resin finishes (polyvinyl or polyacryl compounds), nitrocellulose finishes, methyl or ethyl cellulose finishes, and cellulose acetate finishes.

American Society for Testing Materials, D 684-42 T; 1942. Tentative Methods of Test for Resistance of Textile Fabrics to Microorganisms. Methods are applicable to all types of textile fabrics regardless of the kinds of fiber used in their manufacture but are primarily intended for testing treated cotton fabrics designed for outdoor use.

American Society for Testing Materials, D 737-43T; 1943. Tentative Method of Test for Air Permeability of Textile Fabrics. Gives requirements for apparatus, test specimens, test conditions, procedure, and report.

American Society for Testing Materials, E 41-42 T; 1942. Tentative Definitions With Procedures Relating to Conditioning and Weathering. Intended to apply to all cases where combinations of atmospheric influences are an essential part of materials testing. Definitions, relative humidity determination, room temperature determination, and test in standard laboratory atmosphere.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS59-44; 1944. Textiles-Testing and Reporting. The purpose is to provide standard methods of testing textiles from the standpoint of serviceability and a uniform basis for reporting results of tests. This standard provides methods for testing and reporting the breaking strength of woven fabrics; bursting strength of knit fabrics; colorfastness of textiles to chlorine, dry cleaning, crocking (rubbing), atmospheric gases, laundering, light, perspiration, and pressing (dry and wet); shrinkage in laundering and dry cleaning of woven fabrics; and yarn slippage of woven fabrics. Initiated by National Retail Dry Goods Assn.

U.S. Gov., Federal Specification CCC-T-191a; 1937. Amendment 1; 1940. Textiles; General Specifications, Test Methods. Covers the general physical and chemical methods for testing textiles for conformance with the requirements of Federal specifications. It does not include the special test methods applicable to certain materials which are designated in the appropriate specifications nor does it by any means include all of the textile methods used in the industry.

U.S. Gov., U.S. Army, Quartermaster Corps. Specification 100-17; 1944. Mildew-Proofing of Fabrics, Threads, and Cordage; Copper Processes.

References.—Textile testing machines, *see* 770; coal tar dyes and colors, *see* 803.1; other textile tests and methods, *see* the individual textile.

300.5 TEXTILE TESTING MACHINES

American Society for Testing Materials, D 76-42; 1942. American Standards Assn., L 15.1-1943. Textile Testing Machines. Descriptive of testing machines generally applicable for the determination of certain physical characteristics of textile materials. Covers breaking strength and elongation testing machines, thickness gage, bursting testers, and twist testers.

References.—Textile testing machines, *see* 770.

300.6 DEFINITIONS OF TEXTILE TERMS

American Society for Testing Materials, D 123-44; 1944. Definitions of Terms Relating to Textile Materials. Defines asbestos, standard atmosphere, braid, carrier, process change, standard condition, cone, cord, cortex, count, course, crimp, cut, denier, dew point, elongation, end, epidermis, felt, fiber, hard or leaf fibers, soft or bast fibers, filament, filling, fineness, flax, float, gage, glass, textile glass, gray goods, hank, Holland finish, absolute humidity, relative humidity, lea, length distribution, linen, breaking load, lumen, bonded mat, maturity, medulla, moisture, moisture equilibrium, commercial moisture regain, standard moisture regain, pick, pile, pitch, ply, water vapor pressure, rayon, rayon staple, resilience, roving, asbestos roving, reinforced asbestos roving, sample, selvage, shot, sizing, skein, sleeving, sliver, smash, specimen, splice, strength, breaking strength, bursting strength, tearing strength, tensile strength, tape, sewing thread, tube, tubing, twine, twist, direction of twist, balanced twist, cable twist, hawser twist, typp, unit package, wale, warp, commercial weight, oven-dry weight, grease wool, pulled wool, top wool, yarn, yarn appearance, asbestos yarn, metallic asbestos yarn, plain asbestos yarn, reinforced asbestos yarn, backing yarn, yarn construction, yarn number, yarn numbering systems, equivalent single yarn number, pile yarn, ply or folded yarn, porter yarn, shotting yarn, single yarn, spun rayon yarn, woolen yarn, and worsted yarn. Also glossary of terms relating to textile materials, definitions and photographs of defects in woven fabrics, and terms relating to hand of fabrics.

American Society for Testing Materials, D 123-44T; 1944. Tentative Definitions of Terms Relating to Textile Materials. Defines protans..tenacity, turn, cross-blended yarn, and self-blended yarn. Gives tables listing man-made or synthetic fibers and filaments and natural fibers including animal fibers, mineral fibers, seed hair vegetable fibers, and blast and leaf vegetable fibers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS28-32; 1932. Cotton Fabric Tents, Tarpaulins, and Covers. A commercial standard selected and accepted by industry establishing a standard method of marking tents, tarpaulins, and covers to show the original gray goods weight per square yard without reference to finished or loaded weights, also to show type of fabric by markings, such as a single filling duck, etc.

300.7 STITCHES AND SEAMS

U. S. Gov., Federal Specification DDD-S-751; 1930. Stitches, Seams and Stitching. Covers the formation of the stitches, seams, and stitching used in U. S. Gov. work. Gives complete details with illustrations.

301. PARTIALLY MANUFACTURED COTTON

301.1 WASTE AND PACKING

301.11 Waste

American Transit Assn. Recommended Specification for New Waste E 145-39; 1939. The material covered by this specification shall consist of either cotton waste, wool waste, or a mixture of the two, as specified. Gives detailed requirements as to what constitutes cotton waste, wool waste, combination of wool and cotton waste, and sets forth methods of tests and inspections.

U. S. Gov., Federal Specification DDD-W-101; 1932. Waste; Cotton, Colored. Covers one grade and quality. Gives requirements for weight of bale, volume of bale, and tare; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-W-106; 1932. Amendment 1; 1937. Waste; Cotton, White. Covers one type and grade. Gives requirements for gross weight of bale, volume of value, tare, moisture, and tare content; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Waste for journal boxes, *see* 301.12; wool waste, *see* 363.1.

301.12 Journal Box Packing

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Renovated Journal Box Packing, M-910-39; 1939. Renovating to remove dirt and foreign matter from waste, hand picking and screening, washing in hot oil, resilient condition, sampling stock, properties and tests, method of analysis, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-905-41; 1941. New Waste for Journal Box Packing. Covers new packing waste suitable for freight cars, passenger cars, and locomotives. Gives material, cotton waste, wool waste, combination wool and cotton waste, moisture, oil and dirt, packing and marking, inspection, rejection, and rehearing.

301.2 CAULKING COTTON

U. S. Gov., Navy Dept. Specification 21 C 3d; 1943. Cotton; Calking.

301.3 LINTERS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cotton Linters. Covers definition, characteristics, derivation, uses, standards and grades, containers, and substitutes.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality. Article 18. Cottonseed Linters. Rules 130 to 136. Covers American cotton linters, excess of low grades, rejections and replacements, linters made from burned or damaged seed, linters containing excess trash, cottonseed hull fiber, and standard weight and dimensions.

References.—U. S. grades for other cotton, *see* 300.1.

301.4 MATTRESS FILLING

American Hospital Assn., 1-16. Felt (Garnetted) for Mattress Filling. For inner-spring and cotton-felt mattresses. Covers material and workmanship, general and detail requirements, and methods of inspections and tests. Based on U. S. Navy Dept. Specifications 27 F 9 for Felt (Garnetted) for Mattress Filling (referred to below), and U. S. Gov. Federal Specifications CCC-T-191a, and Amendment 1, for Textiles, General Specifications, Test Methods.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-37; 1941. Mattresses; Cotton Linters (Blown). There shall be but one type and the grade shall be that known commercially as "firsts." Gives requirements for materials, workmanship, case, seams, stitches, tufting, size, weight, sampling, inspection, and tests.

U. S. Gov., Navy Dept. Specification 27F9; 1936. Felt (Garnetted) for Mattress Filling.

301.5 ABSORBENT WASTE

U. S. Gov., Federal Specification DDD-L-427; 1944. Lint; Absorbent. Covers one type and grade. Gives requirements for material, workmanship, weave, bleaching, size, construction, water extract, inorganic matter, reaction, and sizing and loading materials; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Absorbent cotton, surgical, *see* 398.1.

301.6 SMOKELESS POWDER COTTON

U.S. Gov., Navy Dept. Specification 4C3; 1923. Cotton; Smokeless-Powder.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-44; 1930. Cellulose.

References.—Guncotton, *see* 862.

301.7 TARES

302. COTTON YARN, THREAD, AND CORDAGE

302.1 COTTON YARN

302.10 General Items

American Society for Testing Materials, D 180-44; 1944. General Methods of Testing and Tolerances for Cotton Yarns. Includes carded and combed, both single and plied, and both single and multiple wound. Gives definitions, tolerances, methods of testing, and methods for testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cotton Yarn. Covers kinds and uses, specifications for ordering yarn, and import duty.

Underwear Institute. Specification G-2; 1935. Standard Practice of Cone Colors for Single Cotton Yarns. A system of designating single cotton yarn sizes by the colors of the cones upon which they are wound. Gives color of cone and yarn sizes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS11-41; 1941. Regain of Mercerized Cotton Yarns. This standard defines the moisture content and regain to be used in price adjustment of buying and selling cotton yarns and for other purposes. Initiated by National Assn. of Hosiery Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS33-43; 1943. Knit Underwear (Exclusive of Rayon). Covers standard methods of measuring and standard measurements for knit underwear (exclusive of rayon) for boys, children, infants, men, and women. Includes recommended practice on cone colors for single cotton yarns; the color of cone on which the yarn is wound designates the size of yarn; 12 colors are recommended.

302.11 Sea Island Cotton Yarn

302.12 Three-Ply Bleached Cotton Yarn

302.13 Asbestos Yarn

References.—Asbestos yarn, *see* 546.4.

302.2 COTTON THREAD

302.20 General Items

American Society for Testing Materials, D 204-42; 1942. Methods of Testing and Tolerances for Cotton Sewing Threads. Includes untreated and glazed or waxed thread, tolerances allowable, and test procedures for breaking strength, yardage per pound, twist, balance, and running qualities.

302.21 Thread for Flag Making

302.22 Sewing Machine Thread

U. S. Gov., Army-Navy Aeronautical Specification AN-T-46; 1944. Thread; High-Tenacity Cotton.

U. S. Gov., Federal Specification V-T-276b; 1937. Amendment 2; 1943. Thread; Cotton. Covers three types: (I) Machine, in three finishes: (IA) Soft—(IA1) unbleached, (IA2) bleached white and tints, and (IA3) unbleached black and colors; (IB) glazed silk—(IB1) unbleached, (IB2) bleached white and tints, and (IB3) unbleached black and colors; and (IC) mercerized—(IC1) bleached white and tints and (IC2) unbleached black and colors; (II) basting, in one finish—(IIA) glazed silk—(IIA1) bleached white and (IIA2) black; and (III) heavy, unbleached, bleached white, or in colors, in two finishes—(IIIA) soft and (IIIB) glazed silk. Gives requirements for material, workmanship, balance, sewing quality, finish, plyknots and yarn splices, direction of twist, color, fastness to laundering, and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

302.23 Silkateen or Mercerized Cotton Thread

U.S. Gov., Veterans Administration. Specification VA-X-85d; 1941. Thread; Cotton Crochet Mercerized Perle No.3.

302.24 Colored Thread, Polished

302.25 Thread for Canvas Work

302.29 Miscellaneous Cotton Thread

U.S. Gov., Veterans Administration. Specification VA-X-86c; 1941. Thread; Cotton Knitting No.6.

302.3 COTTON TWINE

302.31 Cable Laid Twine

U. S. Gov., Navy Dept. Specification 21T4d; 1938. Twine; Cotton, Mattress, Polished, for Use in Tufting-Machines.

302.32 Cotton Seine Twine

U. S. Gov., Federal Specification T-T-881a; 1933. Twine; Cotton, Seine. Covers one grade in commercial numbers 6, 9, 12, 15, 18, 24, 30, 36, 48, 72, 84, 96, 108, 120, 144, and 168. Gives requirements for material and workmanship, twist, lengths per pound, and breaking strengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 21C6b; 1944. Clothes-Stops.

References.—Tolerances and methods of test for cotton yarn, *see* 302.10; methods of testing textile materials, *see* 300.4.

302.33 Broom Twine

302.34 White and Khaki Colored Twine

References.— Other white twines, *see* 302.31-302.39.

302.35 Sailmakers' Twine

302.36 Wrapping Twine

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Twine for Tying Paper-Wrapped Smoked Meats. No. 24 cotton, tubular braid, stranding, yarn size, weight, and tensile strength.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R124-31; 1931. Polished Cotton Twine. This recommendation establishes a simplified list of stock varieties of plain and surface-colored polished cotton twine. It includes also requirements relating to packaging and colors.

U. S. Gov., Federal Specification T-T-871; 1930. Twine; Cotton, Wrapping. Covers one grade. Gives requirements for material and workmanship, number of plies (2,3,4,5, and 6), lengths per pound, and breaking strengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Tolerances and methods of testing cotton yarn, *see* 302.10; methods of testing textile products, *see* 300.4; jute wrapping twine, *see* 326.

302.39 Miscellaneous Cotton Twine

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Boiled Ham Twine for Tying Hams for Boiling; Twine for Roping Boned Loins for Boiling; Twine for Stringing Sweet Pickled Hams and Picnics; Twine for Tying Casings; Twine for Roping and Hanging Bologna; and Twine for Roping Dry Sausage. Requirements for size of each cotton twine, number of strands, size of yarn, weight, and tensile strength.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1936. Twines. Covers general discussion of twine and gives details for jute twines; istle twines, sisal twines, Manila twines, Java sisal twines, Mexican sisal twines, Italian hemp, American hemp, and cotton twines.

Tag Manufacturers Institute. Manual of Standard Specifications for Strings, 1939. Gives TMI designation, usual dealers name, technical description according to manufacturers standards, approximate yards per pound, and strength of cotton and silk cords and twines and jute twines.

U. S. Gov., Navy Dept. Specification 21 T 9b; 1943. Twine; Flax, Hemp, or Cotton, Mattress—for Use in Side Stitching.

U. S. Gov., Veterans Administration. Specification VA-X-34e; 1941. Chenille; Cotton.

U. S. Gov., Veterans Administration. Specification VA-X-80j; 1942. Roving; Cotton.

References.—Tolerances and methods of testing cotton yarn, *see* 302.10.

302.4 COTTON ROPES AND CORDS

302.40 General Items

American Society for Testing Materials, D 179-42; 1942. Methods of Testing and Tolerances for Tire Cord, Woven and on Cones. Includes cord fabric and cotton cord for use in pneumatic tires, allowable tolerances and methods of testing weight, thickness, breaking strength, elongation, twist, and calibrating and checking cord testing machines for sensitivity.

Cordage Institute. Method of Testing for Tensile Strength, Etc. Hard Fiber Wrapping Twine, 1940. Requirements for pendulum type, power-driven testing machine, speed of moving head, capstans, holding of specimen, conditioning for test, number of tests and yardage determination.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T300; 1925. Development of a Standard Bending Test for Rope Yarns. Describes testing machine and gives recommended procedure for making bending test in which the original twist in the yarn is retained during test.

302.41 Bell and Signal Cord

302.42 Chalk Line

U.S. Gov., U.S. Army, Medical Dept. Specification 17-192; 1939. Chalk Line; With Reel and Awl.

302.43 Gill Line

302.44 Halyards

U. S. Gov., Marine Corps Specification, adopted 1916. Halyards; Flag, Recruiting.

U. S. Gov., Navy Dept. Specification 21H2a; 1933. Halliards; Signal, Braided.

302.45 Lacing Cord

U.S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-97. Cinch; Lash.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R168-37; 1937. Braided Shoe Laces. This recommendation establishes a simplified schedule of stock lengths of braided shoe laces. Initiated by the Shoe Lace Institute.

U. S. Gov., Marine Corps Specification, adopted 1943. Cord; Lacing, Olive Drab.

U. S. Gov., Marine Corps Specification, adopted 1940. Cord; Lacing, Khaki.

U.S. Gov., Navy Dept. Specification 4C1b; 1923. Cord; Lacing, Cartridge-Bag, Silk.

U.S. Gov., Navy Dept. Specification 55L3e; 1944. Laces; Trousers, Rayon, Black.

U.S. Gov., Navy Dept. Specification 72L2a; 1944. Laces; Legging.

U. S. Gov., Treasury Dept., Procurement Div., 444A; 1942. Laces; Shoe, Cotton. Covers two types—(I) round, solid, and (II) tubular, glazed, and mercerized;

made of cotton, carded or combed. Gives requirements for sizes, colors, tips, color fastness, length, weight, and breaking strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-147; 1929. Cord; Cotton, Braided, 1/8 In. Diameter.

U. S. Gov., U.S. Army, Quartermaster Corps. Specification 6-252; 1937. Laces; Breeches.

302.46 Sash Cord

American Hospital Assn., 4-13. Cotton Braided Sash Cord. Covers solid braided unfinished and polished sash cord. Based on U. S. Gov. Federal Specification T-C-571a, and Amendment 1, for Cotton Braided Sash Cord, referred to below.

U. S. Gov., Federal Specification T-C-571a; 1936. Amendment 2; 1936. Cord; Sash, Cotton, Braided. Covers two types—(A) unfinished and (B) polished. Gives requirements for material and workmanship; size, diameter, breaking strengths, number of strands, length per pound, weight of core for each size; nonfibrous material and stretch; methods of sampling, inspection, and tests; and packing and marking.

References.—Tolerances and methods of testing yarns, *see* 302.40, 302.10.

302.47 Wrapping Cords

References.—Wrapping twine, *see* 302.36.

302.48 Yoke Ropes

302.49 Miscellaneous Cotton Cords and Ropes

U. S. Gov., Federal Specification T-C-466; 1943. Clothesline; Cotton, Braided. Shall be of but one type made of natural color cotton yarn and shall have no finishing material added. Gives requirements for workmanship, construction, tolerance, length, size, diameter, breaking strength, number of carriers, length per pound, weight of core, and stretch; methods of sampling, inspection and test; packaging, packing, and marking.

U.S. Gov., Federal Specification T-R-571; 1931. Rope; Cotton. Covers one grade in diameters of 1/8, 3/16, 1/4, 3/8, 1/2, 3/4, and 1 in. Gives requirements for material, workmanship; length per pound and strength; methods of sampling, inspection, and tests; and marking.

U. S. Gov., Marine Corps Specification, adopted 1932. Cord; Cotton, Braided, Olive Drab (for Pistol Lanyards).

U. S. Gov., Navy Dept. Specification 21L3b; 1932. Lines; Cotton, Braided (Lead Line and Taffrail Log Line).

U.S. Gov., Army-Navy Aeronautical Specification AN-C-122; 1944. Cord; Braided Cotton.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-27; 1926. Cord; Special Cotton.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-271; 1939. Rope; Cotton, Waterproofed, for Balkan Frame.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-273; 1939. Clothesline.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-52; 1938. Cord; Cotton, Braided, for Pyrotechnic Parachutes.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-309; 1942. Rope; Parachutist.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-217A; 1932. Rope; Type RP-3, Sash Cord No. 5.

U. S. Gov., U. S. Maritime Commission. Specification 21-MC-1; 1941. Lines; Cotton, Braided (for) Hand-Sounding Leads. Lines shall be solid braided-type I, unpolished and type II, polished—in but one grade, and sizes shall be as designated. Gives requirements for materials, workmanship, construction, sampling, inspection, and tests.

References.—Tolerances and methods of testing yarns and cord, *see* 302.40, 302.10, 303.8; tire cord, *see* 303.8.

303. COTTON MECHANICAL FABRICS

303.0 GENERAL ITEMS

American Society for Testing Materials, D 122-37; 1937. Specifications and Methods of Test for Tire Fabrics Other Than Cord Fabrics. For fabrics used in manufacture of pneumatic tires; requirements for physical properties of plied yarn chafer fabrics, single yarn chafer fabrics, and enameling ducks; for tolerances as to width, weight, count, thickness, breaking strength, twist, crimp, and bow, with tests using A.S.T.M. method D 39.

American Society for Testing Materials, D 181-42; 1942. Specifications and Methods of Test for Certain Heavy Cotton Fabric for Manufacture of Hose and Belting. Gives scope, physical properties, tolerances for width, weight, count, thickness, crimp, and breaking strength, and procedures for testing in accordance with A.S.T.M. method D 39.

American Society for Testing Materials, D 230-44; 1944. Numbered Cotton Duck. Gives scope, physical properties, weave, size content, width, length of pieces, and methods of testing.

American Society for Testing Materials, D 626-41 T; 1941. Tentative Specifications for Fire-Retardant Properties of Treated Textile Fabrics. Fire-retardant properties of fabrics used for decorative or other purposes on the inside of buildings or other structures. Fire-retardant properties, sampling, test specimens, apparatus, and procedure. These specifications are based on the recommended requirements of the Committee on Fireproofing and Preservative Treatments of the National Fire Protection Assn.

American Society for Testing Materials, D 629-42 T; 1942. Tentative Methods of Quantitative Analysis of Textiles. Describe procedures for the quantitative analysis of textiles for—water, total nonfibrous materials, acetate rayon, silk (including silk noils), regenerated cellulose rayon, cotton, and wool (including reprocessed and reused wool), and varieties of these kinds of fibers in mixtures. Types of analysis, general procedure, moisture content or moisture regain, total sizing, finishing, and other nonfibrous materials; mechanical separation or dissection, chemical analysis, and comparative scale for fineness of various textile fibers.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 85-S. Canvas, for back pack cargoing.

U. S. Gov., Marine Corps Specification, adopted 1944. Dyeing and Finishing of Duck and Tent Twill.

303.1 COTTON DUCK

American Hospital Assn., 67-19. Cotton Canvas. Covers "firsts." Based on U. S. Gov., Navy Dept., Specifications 24C8 for Cotton Canvas and U. S. Gov. Federal Specification CCC-T-191a, and Amendment 1, for General Specifications. Test Methods, Textiles.

American Hospital Assn., 67-85. Bleached Duck. Covers one type in "firsts." Based on U. S. Gov., War Dept., Specifications 6-191B for Bleached Duck and U. S. Gov. Federal Specification CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-88. Bleached Cotton Duck. Covers two types. Based on U. S. Gov., Navy Dept., Specifications 27 D 6a for Bleached Cotton Duck and U. S. Gov. Federal Specifications CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-91. Dressed Cotton Duck. Covers one type and grade. Based on U.S. Gov., Navy Dept., Specifications 27D9 for Dressed Cotton Duck and U. S. Gov. Federal Specification CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-97. Fire, Water, and Weather Resistant Cotton Duck. Covers two types in "firsts." Based on U. S. Gov. Federal Specifications CCC-D-746 for Fire, Water, and Weather Resistant Cotton Duck; CCC-D-771a, and Amendment 1, for Plied-Yarns Cotton Duck, Army, Numbered, and Tent Duck; and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-100. Plied-Filling-Yarns and Single-Yarns Cotton Duck (Flat Duck). Covers two types and two classes each type. Based on U. S. Gov. Federal Specifications CCC-D-761, and Amendment 2, for Plied-Filling-Yarns and Single-Yarns Duck (Flat-Duck) and CCC-T-191a and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-103. Plied-Yarns Cotton Duck, Army, Numbered, and Tent-Duck. Covers three types of "firsts." Based on U. S. Gov. Federal Specifications CCC-D-771a for Plied-Yarns Cotton Duck, Army, Numbered, and Tent-Duck and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R27-36; 1936. Cotton Duck. This recommendation covers numbers and widths of sail and wide cotton duck.

U. S. Gov., Federal Specification CCC-D-730; 1943. Duck; Cotton, Bleached. Covers three classes—(A)5 oz. per sq.yd., (B)7 oz. per sq.yd., and (C)8.2 oz. per sq.yd. Gives requirements for material and workmanship, weave, shrinkage, ply, weight, width, construction, breaking strength, sizing, finishing, and nonfibrous materials; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-D-746; 1939. Duck; Cotton, Fire, Water, and Weather Resistant. Covers one grade and two types—(I) numbered duck and (II) army duck. Gives requirements for treatment, flexibility, tackiness, resistance to high and low temperatures, weave, width, breaking strength, water permeability, and resistance to fire; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification CCC-D-761; 1933. Amendment 2; 1940. Duck; Cotton, Plied-Filling-Yarns and Single-Yarns (Flat-Duck). Covers two types—(I) single-filling and (II) double-filling (plied); and two classes—(A) gray and (B) dyed or finished. Gives requirements for sizing, weave, length of roll, tolerances, construction, weight, width, minimum thread count, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-D-771b; 1943. Duck; Cotton, Plied-Yarns (Army, Numbered, and Tent-Duck). Covers four types, (I) numbered, (II) dyed numbered, (III) army, and (IV) dyed army. Gives requirements for cotton, yarn, workmanship, weave, width, size content, color, color fastness, resistant finish, dyed duck, length of pieces, weight, width, yarn ply, count number, and breaking strength; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Marine Corps Specification, revised 1944. Duck; Cotton, Plied Yarns, 20-Oz. Per Square Yard.

U. S. Gov., Navy Dept. Specification 23M3a; 1944. Mats, Collision, and Covers.

U. S. Gov., Navy Dept. Specification 24C8g; 1943. Canvas; Cotton.

U. S. Gov., Navy Dept. Specification 24C14b; 1942. Canvas; Impregnated.

U. S. Gov., Navy Dept. Specification 24D3e; 1942. Duck; Cotton, Pipe-Covering.

U. S. Gov., Navy Dept. Specification 24D5; 1939. Duck for Target Screens (Ravens).

U. S. Gov., Navy Dept. Specification 27C26a; 1942. Canvas; Black.

U. S. Gov., Navy Dept. Specification 27D9a; 1941. Duck; Cotton, Dressed.

U. S. Gov., Navy Dept. Specification 55D9; 1921. Duck; Union.

U. S. Gov., U.S. Army, Army Air Forces. Specification 6-46A; 1934. Duck; Cotton, 12-Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-327; 1943. Duck; Cotton, Grey, 48-Oz. (Stock No. 24-D-22625 thru 22670).

U. S. Gov., Veterans Administration. Specification VA-X-30b; 1941. Cloth; Cross Stitch Canvas (for Handicrafts).

References.—Tolerances, methods of testing, definitions, standard sizes and weights, *see* 303.0, 300.4, 300.6; other cotton duck, *see* 303.2, 303.9.

303.2 CLOTHING DUCK

U. S. Gov., Navy Dept. Specification 27C34; 1941. Canvas; Waistband.

U. S. Gov., Navy Dept. Specification 27D7a; 1940. Duck; Linen, Bleached.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-191B; 1936. Duck; Bleached.

References.—Cotton uniforms, *see* 311.6; *see* references under 303.1.

303.3 DUCK FOR BAGS

American Society for Testing Materials, D 205-39; 1939. Specifications and Methods of Test for Osnaburg Cement Sacks. Applies to osnaburg cement sacks and to the fabric used in their construction. Gives tolerances, samples and details for osnaburg fabric and for osnaburg sacks.

U. S. Gov., Marine Corps Specification, adopted 1940. Cloth; Cotton, Osnaburg.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-280B; 1944. Cloth; Cotton, Osnaburg.

References.—Tolerances, methods of testing, definitions, standard sizes and weights, *see* 303.0, 300.4, 300.6; stitches and stitching, *see* 300.7.

303.4. LINING DUCK

303.5 TENT DUCK

American Hospital Assn., 67-103. Plied-Yarns Cotton Duck, Army, Numbered, and Tent-Duck. Covers three types of "firsts." Based on U. S. Gov. Federal Specifications CCC-D-771a for Plied Yarns Cotton Duck, Army, Numbered, and Tent-Duck, referred to below, and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-D,771b; 1943. Duck; Cotton, Plied-Yarns, Army, Numbered, and Tent-Duck. Covers four types — (I) numbered, (II) dyed numbered, (III) army, and (IV) dyed army. Gives requirements for cotton, yarn, workmanship, weave, width, size content, color, color fastness, resistant finish, dyed duck, length of pieces, weight, width, yarn ply, count number, and breaking strength; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Marine Corps Specification, adopted 1942. Duck; Cotton, Plied-Yarns (Army, Numbered, and Tent-Duck).

References.— Other cotton duck, *see* 303.1; *see* references under 303.3.

303.6 AWNING CLOTH

American Hospital Assn., 67-22. Dyed Canvas (for Ships' Awnings and Outboard Covers). Covers "first." Based on U. S. Gov., Navy Dept. Specifications 24 C 17b for Dyed Canvas, for Ships' Awnings and Outboard Covers, and U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-37. Awning Cloth. Covers five types. Based on U. S. Gov. Federal Specifications CCC-C-406 for Awning Cloth and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-C-406; 1931. Cloth; Awning. Covers five types—(I), (II), and (III) woven stripes; (IV) painted stripes or tinted solid colors; and (V) piece-dyed. Gives requirements for construction, weight, width, thread count, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—*See* references under 303.3.

303.7 DUCK FOR MATTRESS COVERS AND COTS

U. S. Gov., Marine Corps Specification, adopted 1926. Duck; Cotton, Unbleached (for Mattress Covers).

References.—Duck for canvas cots. *see* 319.94.

303.8 TIRE FABRICS

American Society for Testing Materials, D 122-37; 1937. Specifications and Methods of Test for Tire Fabrics Other Than Cord Fabrics. For fabrics used in manufacture of pneumatic tires; requirements for physical properties of plied yarn chafer fabrics, single yarn chafer fabrics, and enameling ducks; for tolerances as to width, weight, count, thickness, breaking strength, twist, crimp, and bow, with tests using A.S.T.M. method D 39.

American Society for Testing Materials, D 179-42; 1942. Methods of Testing and Tolerances for Tire Cord, Woven and on Cones. Includes cord fabric, and cotton cord for use in pneumatic tires, allowable tolerances, and methods of testing weight, thickness, breaking strength, elongation, twist, and calibrating and checking cord testing machines for sensitivity.

American Society for Testing Materials, D 376-35; 1935. Specifications and Methods of Test for Holland Cloth. Includes No.1 and No.2 constructions for use in the tire industry. Gives tolerances, specifications, special requirements, and methods of testing.

U. S. Gov., Army Air Forces. Specification 16137A; 1944. Fabric; Non-Skid Tread.

References.—Tolerances, methods of testing, definitions, standard sizes and weights, *see* 303.0, 300.4, 300.6; pneumatic tires, *see* 206.

303.9 MISCELLANEOUS MECHANICAL FABRIC OF COTTON

303.91 Mode Duck

303.92 White Duck

U. S. Gov., Marine Corps Specification, adopted 1934. Duck; White, 15-Oz. (for Leggings).

References.—White clothing duck, *see* 303.2.

303.93 Enameled Duck

American Hospital Assn., 67-94. Enameled Cotton Duck. Covers one type in "firsts." Based on U. S. Gov. Federal Specifications CCC-D-741 for Enameled Cotton Duck and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-D-741; 1936. Amendment 1; 1938. Duck; Cotton, Enameled. Covers one grade and one type. Gives requirements for finish, length of roll, color, permeability, oxidation, and physical requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

303.94 Rubberized Duck

303.95 Waterproof Duck

U. S. Gov., Marine Corps Specification, adopted 1936. Duck; Bleached, Waterproofed (for Shower Curtains).

U. S. Gov., U. S. Army Chemical Warfare Service. Specification 6-126A; 1928. Duck; Paraffined, O.D.

References.—Waterproof fabric, *see* 392.4.

303.96 Packing and Gaskets

References.—Canvas and other fabric packing, *see* 707.25; *see* Flax Packing, 339.7.

303.97 Hose and Belt Ducks

American Society for Testing Materials, D 181-42; 1942. Specifications and Methods of Test for Certain Heavy Cotton Fabric for Manufacture of Hose and Belting. Gives scope, physical properties; tolerances for width, weight, count, thickness, crimp, and breaking strength; and procedures for testing in accordance with A.S.T.M. method D 39.

References.—Tolerances, methods of test, definitions, standard sizes and weights, *see* 303.0, 300.4, 300.6.

303.99 Mechanical Fabrics Not Otherwise Classified

U. S. Gov., Army Air Forces. Specification 16106-A (1); 1944. Cloth; Wire Mesh, Cotton Covered.

304. COTTON CLOTH, BLEACHED AND UNBLEACHED

304.0 GENERAL ITEMS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cotton Textile Fabrics. Covers description and terms, finishing, length of pieces, packing, sources, types of purchases, quantities, quality, postponements, and terms of payment.

304.1 COTTON CLOTH, PLAIN

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-313; 1943. Cloth; Cotton (Grade B).

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-317; 1943. Cloth; Cotton (Leno Weave).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-65A; 1941. Cloth; Cotton, Cartridge.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-109B; 1941. Cloth; Cotton, Grey and Dyed.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-320; 1943. Cloth; Cotton, Fine, Plain.

References.—Cotton cloth for rubber and pyroxylin coating, *see* 306.24.

304.2 FLANNEL

American Hospital Assn., 67-109. Canton Flannel. Covers two types in "firsts." Based on U. S. Gov. Federal Specifications CCC-F-451 for Canton Flannel and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-112. Heavy Cotton Flannel (Table Felt). Covers one type and two classes in "firsts." Based on U.S. Gov. Federal Specifications CCC-F-456 for Heavy Cotton Flannel (Table Felt) and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-115. Outing Flannel. Covers three types in "firsts." Based on U.S. Gov. Federal Specification CCC-F-466 for Outing Flannel.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R186-42; 1942. Cotton Canton Flannels (Unbleached) for Work Gloves. This program was initiated by the Cotton-Textile Institute, Inc., with a view to conserving material and simplifying production by eliminating unessential weights and weaves of cotton canton flannel used in the manufacture of work gloves. According to the sponsors, the general adoption of this simplified schedule will make possible a reduction in variety from 18 weights and weaves to 9.

U. S. Gov., Federal Specification CCC-F-451; 1933. Flannel; Canton. Covers one grade and two types—A and B. Gives requirements for width, weight, thread count, length of bolt or roll, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-F-456; 1934. Flannel; Cotton, Heavy (Table-Felt). Covers one grade, one type, and two classes—(A) 54 in. wide, and (B) 72 in. wide. Gives requirements for weave, finish, thread count, tolerances, width, weight, length of cuts or rolls, and tensile strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-F-466; 1936. Flannel; Outing. Covers one grade and three types—I, II, and III. Gives requirements for construction, weight, thread count, strength, colors, napping, and widths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 27F6; 1929. Flannel; Cotton, Domet, Bleached (Aircraft Use).

U. S. Gov., Treasury Dept., Procurement Div., No. 546; 1942. Shirting; Flannel, Plaid, Shrunk. Covers one type and grade known as "firsts," made of thoroughly cleaned cotton. Gives requirements for weave, colors and patterns, color fastness, thread count, breaking strength, weight, width, shrinkage, and sizing; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 6-54; 1926. Flannel; Domet, Bleached (for Wiping Cloth).

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-22; 1941. Table-Felts; Cotton Flannel. Shall be but one type and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, weave, finish, thread count, weight, strength, size, edges, sampling, inspection, and tests.

References.—Cotton grades, *see* 300.0, 300.1; tolerances, methods of testing, definitions, *see* 300.4, 300.6.

304.3 CHEESE CLOTH

American Hospital Assn., 67-31. Bleached and Unbleached Cheesecloth. Covers two types and two classes in each type. Based on U. S. Gov. Federal Specifications CCC-C-271 for Bleached and Unbleached Cheesecloth and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Cheese Cloth and Muslin. Include six grades for wiping smoked meats and desks, for lining meat boxes and tubs, for sacking meat cuts and smoked meats, and for straining brine; requirements for thread counts and weight.

U. S. Gov., Federal Specification CCC-C-271; 1932. Cheesecloth; Bleached and Unbleached. Covers one grade; two types—(I) unbleached and (II) bleached; and two classes—(A) 38 1/2-in. width and (B) 36-in. width. Gives requirements for construction, weave, length of cuts or rolls, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-C-301; 1932. Cheesecloth; (for) Wiping Purposes (Remnants and Seconds). Covers two types—(I) bleached and (II) unbleached; one grade and two classes—(A) short lengths or remnants and (B) long lengths. Gives requirements for material, workmanship, weave, finish, width, weight, and lengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

304.4 DRILL

American Hospital Assn., 67-43. Unbleached (Fully Shrunk) Drill Cloth. Covers one type in "firsts." Based on U. S. Gov., War Dept., Specifications for Unbleached (Fully Shrunk) Drill Cloth and U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-76. Bleached and Shrunk Drill. Covers five types. Based on U. S. Gov., Navy Dept., Specifications 27-D-5c for Bleached and Shrunk Drill and U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-79. 39-In. Blue Cotton Drill. Covers one type and grade. Based on U. S. Gov., Navy Dept., Specifications 27 D 8a for 39-In. Blue Cotton Drill and U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-82. Unbleached Drill. Covers four types in "firsts." Based on U. S. Gov. Federal Specifications CCC-D-651 for Unbleached Drill and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Society for Testing Materials, D 334-40; 1940. Specifications and Methods of Test for Cotton Goods for Rubber and Pyroxylin Coating. Gives scope, quality, defects, selvage, sizing, injurious chemicals, width, count, unit weight; breaking strength for sheeting, drill, twill, broken twill, and sateen; length of cut and methods of testing.

U. S. Gov., Federal Specification CCC-D651; 1932. Drill; Unbleached. Covers one grade and six types. Gives requirements for finish, weave, width, length of bolt, breaking strength, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1937. Drilling; Bleached (Shrunk).

U. S. Gov., Marine Corps Specification, adopted 1943. Drilling; Cotton, Bleached, Preshrunk, (5-Oz).

U. S. Gov., Navy Dept. Specification 27Dlc; 1944. Drill; Cotton, Fire- and Weather-Resistant.

U. S. Gov., Treasury Dept., Procurement Div., No. 393; 1939. Drill; Pocket, Unbleached. Shall be of one type made of thoroughly cleaned cotton, of the grade known as "firsts." Gives requirements for weight, thread count, weave, breaking strength, and width; method of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-247B; 1943. Cloth; Cotton, Drill (Fully Shrunk).

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; gray goods for converting trade, *see* 304.1.

304.5 JEAN

American Hospital Assn., 67-124. Bleached Jean. Covers one type of "firsts." Based on U. S. Gov. Federal Specifications CCC-J-191 for Bleached Jean and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-J-191; 1932. Jean; Bleached. Covers one type and grade. Gives requirements for weave, length of rolls, finish, width, weight, thread count, and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1944. Cloth; Cotton, Jean. Bleached.

References.—Tolerances, methods of testing definitions, *see* 300.4, 300.6; gray goods for converting trade, *see* 304.1.

304.6 MUSLINS

American Hospital Assn., 67-139. Bleached Muslin. Covers two types. Based on U. S. Gov. Federal Specifications CCC-M-191 for Bleached Muslin and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-142. Unbleached Muslin. Covers one class, one type, and one grade. Based on U. S. Army Specifications 10-2514 for Unbleached Muslin.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Cheese Cloth and Muslin. Include six grades for wiping smoked meats and desks, for lining meat boxes and tubs, for sacking meat cuts and smoked meats, and for straining brine; requirements for thread counts and weight.

U. S. Gov., Federal Specification CCC-M-911; 1936. Amendment 1; 1941. Muslin; Bleached. Covers two types—(I) minimum weight, 3.1 oz. per sq.yd.; and (II) minimum weight, 2.4 oz. per sq.yd.; bleached white; nainsook or pure finish. Gives requirements for finish, tolerance, widths, length of bolt or roll, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S Gov., Marine Corps Specification, revised 1931. Muslin; Unbleached (for Target Backing).

U. S. Gov., Treasury Dept., Procurement Div., No. 397; 1940. Muslin; Unbleached. Shall be of one type made from throughly cleaned cotton of the grade known as "firsts." Gives requirements for weight, width, thread count, breaking strength, and finish; method sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov , U. S. Army, Medical Dept. Specification 10-2514; 1939. Muslin; Unbleached.

References.—Gray goods for converting trade, *see* 304.1.

304.7 SHEETINGS

304.71 Sheetings, Bleached and Unbleached

American Hospital Assn., 67-160. Wide Bleached Cotton Sheeting. Covers six types in "firsts." Based on U. S. Gov. Federal Specifications CCC-S-271 for Wide Bleached Cotton Sheeting and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-163. Laundry (Cover-Cloth) Cotton Sheeting. Covers one type and two classes in "firsts." Based on U. S. Gov. Federal Specifications CCC-S-276 for Laundry (Cover-Cloth) Cotton Sheeting and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-166. Narrow Unbleached Cotton Sheeting. Covers six types in "firsts." Based on U. S. Gov. Federal Specifications CCC-S-281 for Narrow Unbleached Cotton Sheeting and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-169. Wide Unbleached Cotton Sheeting. Covers "firsts." Based on U. S. Gov. Federal Specifications CCC-S-191 for Wide Unbleached Cotton Sheeting and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Society for Testing Materials, D334-40; 1940. Specifications and Methods of Test for Cotton Goods for Rubber and Pyroxylin Coating. Gives scope, quality, defects, selvage, sizing, injurious chemicals, width, count, unit weight; breaking strength for sheeting, drill, twill, broken twill, and sateen; length of cut and methods of testing.

American Society for Testing Materials, D503-40T; 1940. Tentative Specifications for Bleached Wide Cotton Sheeting. For bed sheeting of plain woven fabric made of single yarns, either carded or combed. Covers six types based on number of filling yarns per inch; requirements for count, weight, breaking strength, and sizing, with tests using A.S.T.M. method D39, and for sizing D276.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS32-31; 1931. Cotton Cloth for Rubber and Pyroxylin Coating. A Commercial standard selected and accepted by industry covering requirements on textile strengths for various constructions of sheeting, drill, twill, broken twill, and sateen, length of cuts, permissible defects, sizing and injurious chemicals, with methods of test. Initiated by Cotton Textile Institute.

U. S. Gov., Federal Specification CCC-S-271a; 1943. Sheeting; Cotton, bleached, wide. Covers two classes—(A) 4.6 oz. per sq.yd. (74x66), and (B) 4.2 oz. per sq.yd. (68x60). Gives requirements for material, workmanship, weave, width, weight, thread count, breaking strength, and total sizing; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-S-276; 1935. Sheeting; Cotton, Laundry (Cover-Cloth). Covers one grade, one type, and two classes—(A) 72 in. wide and (B) 90 in. wide. Gives requirements for thread count, length of cuts or rolls. width, weight, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-S-281; 1931. Amendment 3; 1941. Sheeting; Cotton, Unbleached, Narrow. Covers one grade and six types. Gives requirements for weave, length of cuts or rolls, thread count, width, weight, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-S-291a; 1943. Sheeting; Cotton, Unbleached, Wide. Covers two classes—(A) 4.7 oz. per sq.yd. (68x72) and (B) 4.3 oz. per sq.yd. (64x64). Gives requirements for weave, material, workmanship, length of roll or bolt, thread count, width, weight, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1944. Sheeting; Cotton, Bleached, Preshrunk.

U. S. Gov., Marine Corps Specification, adopted 1943. Sheeting; Cotton, Unbleached, Preshrunk.

U. S. Gov., Navy Dept. Specification 27S11; 1939. Sheeting; Cotton, Bleached and Unbleached, Preshrunk.

U. S. Gov., Treasury Dept., Procurement Div., No. 386; 1939. Sheeting; Colored. Covers one type and grade known as "firsts," made of thoroughly cleaned cotton. Gives requirements for basic and finished fabric, thread count, breaking strength, weight, width, sizing, finish, colors, and color fastness; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-322; 1943. Cloth; Cotton, Sheeting, Coating Quality.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-323; 1943. Cloth; Cotton, Sheeting.

References.—Tolerances, methods of testing definitions, *see* 300.4, 300.6; sheets, brown sheeting, *see* 315.2, 304.76; rubber sheeting, *see* 204.33; gray goods for converting trade, *see* 304.1.

304.72 Cotton Hull Sheeting

304.73 Pontoon Sheeting

304.74 Cotton Sheeting for Mounting

304.75 Gray Cotton Sheeting

304.76 Brown Sheeting

References.—Tolerances, methods of testing definitions, *see* 300.4, 300.6; unbleached cotton sheeting, *see* 304.71.

304.8 TICKING

American Hospital Assn., 1-40. Mattress and Pillow Ticking. Two types and one grade (i.e., "firsts"). Based on U. S. Gov. Federal Specifications CCC-T-351 for Mattress and Pillow Ticking and CCC-T-191a for Textiles, General Specifications, Test Methods.

U. S. Gov., Federal Specification CCC-T-351; 1931. Ticking; Mattress and Pillow. Gives requirements for design, weave, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

304.9 COTTON TOWELING

American Hospital Assn., 67-202. Cotton Toweling. Covers "firsts." Based on U. S. Gov., War Dept., Specifications 6-159 for Cotton Toweling.

American Hospital Assn., 67-208. Crash; Cotton, and Cotton and Linen-Mixed Toweling. Covers two types. Based on U. S. Gov. Federal Specifications CCC-T-571 for Crash, Cotton, and Cotton and Linen-Mixed Toweling and CCC-T-191a for General Specifications, Test Methods, Textiles.

304.91 Cotton Crash Toweling

American Hospital Assn., 67-217. Crash; Cotton, and Cotton and Linen-Mixed Towels. Covers two types in "firsts." Based on U. S. Gov. Specifications DDD-T-511 for Crash, Cotton, and Cotton and Linen-Mixed Towels and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-T-571: 1932. Amendment 2; 1938. Toweling; Crash, Cotton, and Cotton and Linen-Mixed. Covers one grade and two types—(A) mixed linen and cotton and (B) all cotton. Gives requirements for weight, thread count, width, breaking strength, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-T-511; 1932. Towels; Crash, Cotton, and Cotton-and-Linen-Mixed. Covers one grade and two types—(A) mixed linen and cotton and (B) all cotton. Gives requirements for construction, finish, hems, weight, thread count, dimensions, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Towels, *see* 319.3, tolerances, methods of testing, definitions, *see* 300.4, 300.6.

304.92 Cotton Huck Toweling

American Hospital Assn., 67-223. Office Huck Towels (With Woven Name). Covers one grade in "firsts." Based on U. S. Gov. Federal Specifications DDD-T-531 for Office Huck Towels (With Woven Name) and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Treasury Dept., Procurement Div., 401A; 1942. Toweling; Huck. Shall be made of thoroughly cleaned cotton free from waste. Gives requirements for weave, color, thread count, weight, width, sizing; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 468b; 1943. Towels; Huck, Cotton Hand. Shall be made of thoroughly cleaned cotton, free from waste, of the grade known as "firsts." Covers detail requirements as to weave, color, thread count, weight, width and length, and sizing; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—*See* references under 304.91.

304.93 Turkish Toweling

American Hospital Assn., 67-211. Turkish Toweling. Covers one grade for filtering feed water. Based on U. S. Gov., Navy Dept., Specification 27 T 2c for Turkish Toweling and U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Test Methods, Textiles.

American Society for Testing Materials, D505-40; 1940. Terry (Turkish) Toweling. For cotton fabric covered with loops on both sides, constructed with a set of ground warp yarns, either single or double ply, a set of warp pile yarns, and a set of filling yarns. Includes four types, properties, and methods of testing.

U. S. Gov., Dept of the Treasury, Procurement Div., 403B; 1942. Toweling; Terry, Bleached. Shall be of the terry weave with uncut loops on both sides. At every interval of 40 in. in the length there shall be woven a 6 in. section of unlooped material, with woven fast selvage edges approximately 1/4 in. wide. Gives detail requirements as to yarn count, breaking strength, weight, width, sizing, and method of sampling, inspection, and tests.

U. S. Gov., Navy Dept. Specification 27T2d; 1942. Toweling; Turkish.

References.—*See* references under 304.91.

304.94 Dish Toweling

American Hospital Assn., 67-205. Glass Cotton Toweling. Covers one type. Based on U. S. Gov. Federal Specifications CCC-T-561 for Glass Cotton Toweling and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-214. Glass Cotton Towels. Covers one type of "Firsts." Based on U. S. Gov. Federal Specifications DDD-T-501 for Glass Cotton Towels; CCC-T-191a for General Specifications, Test Methods, Textiles; and CCC-T-561 for Glass Cotton Toweling.

American Hospital Assn., 67-220. Union Glass Towels. Covers "Union" type in "firsts." Based on U. S. Gov., Navy Dept., Specification 27 T 8a for Union Glass Towels and U. S. Gov. Federal Specifications CCC-T-191a for General Specifications, Test Methods Textiles.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-57-S. Toweling; Dish.

U. S. Gov., Federal Specification CCC-T-561; 1932. Toweling; Cotton, Glass. Covers one type and grade. thread count, breaking strength, and length of bolt; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-T-501; 1932. Towels; Cotton, Glass. Covers one type and grade. Gives requirements for material, workmanship, length, and width; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—*See* references under 304.91.

306. COTTON CLOTH, PRINTED, DYED, COLORED, OR WOVEN FIGURED

306.0 GENERAL ITEMS

Textile Color Card Assn. of the U. S., Inc. Standard Ninth Edition Color Card, 1944. A new master color card for all industries and trades. This is not a card presenting fashion colors for but one season only, but it embraces a complete collection of important staple shades having continued popular acceptance. A Research Associate has been established at the National Bureau of Standards to include the calibration of the 216 colors contained in the Ninth Edition of the Standard Color Card of America and the translation of these standards into the language of scientific equivalents and nomenclature.

Textile Color Card Assn. of the U. S., Inc. Military Colors, 1944. Standard color card for the official standardized shades authorized by the Quartermaster General and supplement showing the official colors for arms and services. Also official standard colors for U. S. Navy.

Textile Color Card Assn. of the U. S., Inc. Standard Color Card, 1944. Flag Colors of the United Nations and South American Republics. A standard reference of the authentic flag colors of all the United Nations and the South American Republics.

306.1 DRESS MATERIAL

306.11 Calico

306.12 Chambray

American Hospital Assn., 67-28. Chambray. Covers two types of "firsts." Based on U. S. Gov. Federal Specifications CCC-C-231 for Chambray and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-C231a; 1942. Chambray. Covers two types and one grade. Gives requirements for weave, length of bolt or roll, tolerances, finish, color, fastness to light and washing, and shrinkage; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 382; 1939. Chambray (for Use Only in Emergency Relief Purchases). Shall be of four types—(I) blue and gray, shrunk; (II) blue and gray, unshrunk; (III) fancy, unshrunk; and (IV) fancy and plaids, unshrunk, made of thoroughly cleaned cotton, the grade known as "firsts." Gives requirements for length of bolt, colors, color fastness, threads per inch, breaking strength, shrinkage, weight, width, and sizing; methods of sampling, inspection, and tests; and packaging, packing and marking.

306.13 Checks

306.14 Lawn

U. S. Gov., Treasury Dept., Procurement Div., 380A; 1940. Lawn. Covers one type and two classes—(A) white lawn, 88 x 80; and (B) printed lawn, 76 x 68, of the grade known commercially as "firsts," suitable for women's and children's dresses. Gives requirements for finish, length of bolt, colors and patterns, color fastness, weight, width, thread count, and breaking strength; methods of sampling, inspection, and tests; and packaging, packing and marking.

306.15 Nainsook

U. S. Gov., Marine Corps Specification, adopted 1941. Nainsook; Checked, Bleached.

U. S. Gov., Navy Dept. Specification 27N2; 1942. Nainsook; Checked, Bleached.

U. S. Gov., Treasury Dept., Procurement Div., No. 378; 1939. Nainsook; Plain Bleached. Shall be of one type and the grade known commercially as "firsts," made of thoroughly cleaned cotton. Gives requirements for basic and finished fabrics, weight, width, thread count, finish, breaking strength, and length of bolt; methods of sampling, inspection, and tests; and packaging, packing, and marking.

306.16 Seersucker

U. S. Gov., Treasury Dept., Procurement Div., No. 405; 1941. Seersucker; Woven. Shall be crinkled seersucker type, having pronounced creped or seersucker stripes, plain weave, using a tight beam for plain part and slack beam for crepe or seersucker part; suitable for women's and children's garments. Gives requirements for thread count, breaking strength, weight, width, sizing, colors, color fastness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-329; 1944. Cloth; Cotton, Seersucker, 4 Oz.

306.17 Swiss

American Hospital Assn., 67-184. Cotton Dotted Swiss. Covers one type and grade. Based on U. S. Gov. Federal Specifications CCC-S-891 for Cotton Dotted Swiss and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-S-891; 1936. Swiss; Dotted, Cotton. Covers one type and grade. Gives requirements for width, ends and picks, tensile strength, weight, colors, and dots; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

306.18 Gingham

American Hospital Assn., 67-118. Gingham. Covers one type of "firsts." Based on U. S. Gov. Federal Specifications CCC-G-391 for Gingham and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-G-391; 1932. Gingham. Covers one type and grade. Gives requirements for weight, width, finish, weave, thread count, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

306.19 Miscellaneous Cotton Dress Materials

American Hospital Assn., 67-16. Mercerized Cotton Broadcloth. Covers two types. Based on U. S. Gov. Federal Specifications CCC-B-686 for Mercerized Cotton Broadcloth and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-136. Cotton Longcloth. Covers one type and grade. Based on U. S. Gov. Federal Specifications CCC-L-591 for Cotton Longcloth and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-151. Percale. Covers one type in "firsts." Based on U. S. Gov. Federal Specifications CCC-P-191 for Percale and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Society for Testing Materials, D 504-41T; 1941. Tentative Specifications for Bleached Cotton Broadcloth. Classification (in four types), physical properties, and methods of testing.

U. S. Gov., Federal Specification CCC-B-686; 1937. Amendment 1; 1941. Broadcloth; Cotton, Mercerized. Covers two types—A and B, and one grade. Gives requirements for material, workmanship, colors, finish, shrinkage, and width; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-L-591; 1938. Longcloth; Cotton. Covers one type and grade. Gives requirements for ends and picks, breaking strength, weight, colors, finish, and width; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-P-191a; 1944. Percale. Covers one type and one grade. Gives requirements for material, workmanship, weave, width, weight, construction, breaking strength, colors and patterns, finish, nonfibrous materials, shrinkage, colorfastness, and length of bolts or rolls; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, revised 1943. Cloth; Cotton, Broadcloth, White and Khaki.

U. S. Gov., Marine Corps Specification, revised 1944. Cloth; Cotton, Poplin, Olive Drab (Wind-Resistant and Water-Repellent).

U. S. Gov., Marine Corps Specification, adopted 1944. Cloth; Cotton, Mercerized, White.

U. S. Gov., Treasury Dept., Procurement Div., No. 376; 1939. Dimity Printed (for Use Only in Emergency Relief Purchases). Shall be of one type and one grade known commercially as "firsts," and made of thoroughly cleaned cotton. Gives requirements for basic fabric, finished fabric, weight, width, thread count, length of bolt, colors, and patterns; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 377. 1939. Percales; Cotton (for Use in Emergency Relief Purchases Only). Shall be of one type and grade shall be that known commercially as "firsts," made of thoroughly cleaned cotton. Gives requirements for basic fabric, finished fabric, weight, width, thread count, breaking strength, colors, length of bolt, and color fastness; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 387; 1939. Pique. Shall be of one type of the grade known as "firsts," made of thoroughly cleaned cotton. Gives requirements for basic and finished fabric, thread count, breaking strength, width, weight, sizing, colors, and color fastness; and methods of sampling, inspection and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 388; 1939. Suede; Shrunk. Shall be of one type of the grade known as "firsts," made of thoroughly cleaned cotton. Gives requirements for basic fabric, finished fabric, thread count, breaking strength, width, weight, shrinkage, sizing, finish, color, and color fastness; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-328; 1944. Cloth; Cotton, Poplin, 4 Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-341; 1944. Cloth; Cotton, Oxford and Poplin, for Pajamas.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; standard colors, *see* 306.0.

306.2 LINING MATERIALS

U. S. Gov., Navy Dept. Specification 27L7; 1940. Linings.

306.21 Canvas, Crinoline, and Buckram

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS57-40; 1940. Book Cloths, Buckrams and Impregnated Fabrics for Bookbinding Purposes, Except Library Bindings. General requirements, definitions, groups, specific and minimum requirements, tolerances, test conditions, sampling, and methods of test. Prepared under auspices of and approved by Book Manufacturers Institute, Employing Bookbinders of America, Institute of Book Cloths and Impregnated Fabric Manufacturers. Approved by American Standards Assn. as CS57-40.

U. S. Gov., Marine Corps Specification, adopted 1934. Buckram.

U. S. Gov., Navy Dept. Specification 27B8a; 1942. Buckram; White.

U. S. Gov., Navy Dept. Specification 27C29; 1939. Canvas; Lining.

U. S. Gov., Treasury Dept., Procurement Div. No. 621; 1943. Buckram. Covers two types—(I) for bookbinding and (II) for clothing; and classes A, B, C, and D. Gives requirements for material, workmanship, color, weave, physical requirements, width, length, sizing, finish, thread count, breaking strength, weight and shrinkage; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-7A; 1942. Cloth; Cotton, Buckram, 12 Oz.

References.—Cotton duck, *see* 303.1, 303.2.

306.22 Cambric

American Hospital Assn., 67-17. Cambric. Covers one type and grade. Based on U. S. Gov. Federal Specifications CCC-C-81 for Cambric and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-C-81; 1938. Cambric. Covers one type and grade. Gives requirements for ends and picks, breaking strength, weight, colors, shrinkage, width, and finish;

methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Varnished cambric, *see* 719.56; varnished cloth, *see* 392.13.

306.23 Padding

U. S. Gov., Marine Corps Specification, adopted 1940. Cloth; Padding, Cotton.

U. S. Gov., Marine Corps Specification, adopted 1940. Cloth; Padding, Cotton, Hair and Rayon.

U. S. Gov., Marine Corps Specification, adopted 1941. Cloth; Padding, Linen and Cotton, Permanent Finish.

U. S. Gov., Marine Corps Specification, adopted 1926. Padding; Black.

U. S. Gov., Marine Corps Specification, adopted 1926. Padding; Green.

U. S. Gov., Marine Corps Specification, adopted 1927. Padding; Vest (for Officers).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 14-6A; 1942. Cloth; Padding, Canvas.

306.24 Sateen and Silesia

American Society for Testing Materials, D 334-40; 1940. Specifications and Methods of Test for Cotton Goods for Rubber and Pyroxylin Coating. Gives scope, quality, defects, selvage, sizing, injurious chemicals, width, count, unit weight; breaking strength for sheeting, drill, twill, broken twill, and sateen; length of cut and methods of testing.

U. S. Gov., Army Air Forces. Specification 16147A; 1944. Cloth; Cotton Sateen.

U S. Gov., Army-Navy Aeronautical Specification AN-C-112; 1943. Cloth; High Tear Resisting Sateen Cotton.

U. S. Gov., Federal Specification CCC-S-91; 1938. Sateen; Cotton. Covers two types—I and II. Gives requirements for weight, colors, dye, length, width, finish, sizing, weave, and bursting strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1940. Cloth; Sateen, 2-Ply, Rubberized.

U. S. Gov., Marine Corps Specification, revised 1942. Lining; Sateen, Tan.

U. S. Gov., Marine Corps Specification, adopted 1926. Lining; Sleeve, Striped Sateen (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1942. Silesia (Cotton Lining).

U. S. Gov., Navy Dept. Specification 27S12a; 1944. Silesia; Black.

U. S. Gov., Treasury Dept., Procurement Div., No. 379; 1939. Sateen (for Use Only in Emergency Relief Purchases). Shall be of one type of the grade known commercially as "firsts,"made of thoroughly cleaned cotton. Gives requirements for basic and finished fabric, thread count, breaking strength, weight, width, sizing, finish, length of bolt, color, and color fastness; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 384; 1939. Silesia. Shall be of one type of the grade known as "firsts," made of thoroughly cleaned cotton. Gives requirements for basic and finished fabric, thread count, weight, width, sizing, breaking strength, colors, and color fastness; method of sampling, inspection and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-18D; 1943. Cloth; Cotton, Silesia, 5 Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-337; 1944. Cloth; Cotton, Wind-Resistant, Sateen, 9 Oz.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

306.25 Lustrine

U. S. Gov., Navy Dept. Specification 55L4; 1922. Lustrine; Black, 40-In..

306.26 Galatea

306.27 Wigan

U. S. Gov., Navy Dept. Specification 27W8a; 1944. Wigan; Black.

306.28 Venetian

U. S. Gov., Navy Dept. Specification 27V2a; 1936. Venetian; Black.

306.29 Miscellaneous Lining Materials

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-237; 1936. Cloth; Cotton, Lining for Overcoats.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-291; 1941. Cloth; Lining, Collar Stiffening.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-325; 1943. Interlining; Cotton, Worsted Spun Hair Filling.

306.3 SUITING, COTTON

306.31 Denim and Cottonade

American Hospital Assn., 67-61. Indigo Blue Denim (Fully Shrunk). Covers two types in "firsts" and four classes. Based on U. S. Gov. Federal Specifications for Indigo (Fully Shrunk) Blue Denim and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-64. Indigo Blue Denim (Unshrunk). Covers two types in "firsts." Based on U. S. Gov. Federal Specifications for Unshrunk Indigo Blue Denim and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-67. Shrunk Brown Denim. Covers "2.20 brown denim, white back," in "firsts." Based on U. S. Gov. Federal Specifications for Shrunk Brown Denim and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-70. Unshrunk Brown Denim. Covers "2.20 brown denim, white back," in "firsts." Based on U. S. Gov. Federal Specifications for Unshrunk Brown Denim and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-D-181; 1944. Denim; Shrunk. Covers two types—(I) whiteback and (II) colored filling; four classes—(A) 2.20 yard, (B) 2.00 yard, (C) 1.78 yard, and (D) 1.60 yard; and the grade shall be known commercially as "firsts." Gives requirements for material, workmanship, color, length of cuts, width, weave, colorfastness, shrinkage, construction, weight, breaking strength, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification CCC-D-186; 1944. Denim; Unshrunk. Covers two types—(I) whiteback and (II) colored filling; four classes—(A) 2.45 yard, (B) 2.20 yard, (C) 2.00 yard, and (D) 1.78 yard; and the grade shall be known commercially as "firsts." Gives requirements for material, workmanship, color, length of cuts, width, weave, colorfastness, construction, weight, breaking strength, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 27D4b; 1940. Denim; Prison, Gray.

U. S. Gov., Treasury Dept., Procurement Div., No. 400; 1940. Suiting, Cottonade. Shall be of two types—(I) shrunk and (II) unshrunk; suitable for men's and boys' trousers, twill weave, having a slightly napped back and sufficiently pliable to permit ready sewing. Gives requirements for patterns and colors, color fastness, thread count, breaking strength, weight, width, shrinkage, and sizing; method of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

306.32 Uniform Cloth, Cotton

U. S. Gov., Army Air Forces. Specification 16151; 1944. Cloth; Cotton Element Mercerized.

U. S. Gov., Marine Corps Specification, adopted 1943. Cloth; Cotton, Suiting, Green.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-321A; 1944. Cloth; Cotton, Wind-Resistant.

References.—Clothing duck, *see* 303.2; khaki uniform cloth, *see* 306.34; cotton twill uniform cloth, *see* 306.36.

306.33 Italian Cloth

U. S. Gov., Marine Corps Specification, adopted 1938. Cloth; Italian (Black and Green).

306.34 Khaki Cloth, Cotton

U. S. Gov., Marine Corps Specification, revised 1942. Shirting; Cotton, Khaki (Shrunk).

U. S. Gov., Marine Corps Specification, revised 1942. Suiting; Khaki (Shrunk).

U. S. Gov., Treasury Dept., Procurement Div., No. 383; 1939. Twill; Khaki (Shrunk and Unshrunk). Shall be made of thoroughly cleaned cotton, of the grade known as "firsts," and free from imperfections of manufacture. Gives requirements for basic and finished fabric, length of bolt, color fastness, color, thread count, breaking strength, weight, width, and sizing; method of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 6-187A; 1943. Cloth; Cotton, Olive Drab, for Bandoleers.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6S-201A; 1936. Cloth; Cotton, Khaki, Uniform, for Emergency Purposes.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; standard colors, *see* 306.0.

306.35 Print Cloth

U. S. Gov., Treasury Dept., Procurement Div., No. 390; 1939. Prints; Cotton. Covers one type, 2 grades—(A) for women's and children's dresses and (B) for comforter coverings. Gives requirements for basic and finished fabric, colors, color patterns, width, thread count, weight, and sizing; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-324; 1943. Cloth; Cotton, Print.

References.—Gray goods for converting trade, *see* 304.1.

306.36 Cotton Twill

U. S. Gov., Army Air Forces. Specification 16160; 1944. Cloth; Fire-Resistant Cotton Twill.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-103a; 1944. Cloth; Cotton Twill.

U. S. Gov., Joint Army-Navy Specification Jan-C-154; 1944. Cloth; Cotton, Herringbone Twill.

U. S. Gov., Marine Corps Specification, adopted 1943. Twill; Cotton, Bleached (5-Oz.).

U. S. Gov., Marine Corps Specification, adopted 1943. Twill; Cotton, Bleached, Preshrunk, (6-Oz.).

U. S. Gov., Marine Corps Specification, revised 1942. Cloth; Cotton, Herringbone Twill.

U. S. Gov., Marine Corps Specification, revised 1943. Cloth; Cotton, Twill, Olive Green, 5 1/2 to 6-Oz.

U. S. Gov., Navy Dept. Specification 27L6a; 1944. Lining; Twill, Black.

U. S. Gov., Navy Dept. Specification 27T12e; 1944. Twill; Cotton, Black.

U. S. Gov., Navy Dept. Specification 27T21; 1941. Twill; Steep, Cotton, Bleached.

U. S. Gov., Navy Dept. Specification 27T24; 1941. Twill; Cotton, Blue, 39-In.

U. S. Gov., Navy Dept. Specification 27T25a; 1944. Twill; Cotton, Bleached.

U. S. Gov., Treasury Dept., Procurement Div., No. 404; 1940. Suiting; Cotton Tweed. Covers 2 types—(I) shrunk and (II) unshrunk; shall be suitable for women's wear, having a wool appearance and tweed effect. Gives requirements for thread count, colors, color fastness, breaking strength, weight, width, shrinkage, and sizing; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-315; 1943. Fabric; Cotton Twill.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-54; 1937. Cloth; Cotton, Twill, for Use in Pyrotechnic Parachutes and Powder Bags.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-100C; 1943. Cloth; Cotton, Albert Twill, 5 Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-201B; 1942. Cloth; Cotton, Uniform, Twill, 8.2 oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-311; 1942. Cloth; Cotton, Uniform, Twill, 6 Oz.

U. S. Gov., Veterans Administration. Specification VA-X-14f; 1939. Twill; Bleached, for White Coats, Trousers, Caps, and Aprons.

U. S. Gov., Veterans Administration. Specification VA-X-15d; 1942. Twill; Bleached, for Male and Female Smocks.

U. S. Gov., Veterans Administration. Specification VA-X-128f; 1940. Twill; Tan Color, for Trousers, Summer.

U. S. Gov., Veterans Administration. Specification VA-X-187a; 1941. Twill; Bleached, for Aprons.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; gray goods for converting trade, *see* 304.1.

306.4 BUNTING

306.41 Cotton Bunting

U. S. Gov., Federal Specification CCC-B-791a; 1937. Amendment 5; 1944. Bunting; Cotton, Mercerized. Covers one grade and two types—(A) light weight and (B) heavy weight. Gives requirements for material, workmanship, weave, mercerization, singeing, selvages, tolerances, length of bolt, color, defects, and physical requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; standard colors, *see* 306.0.

306.42 Wool Bunting

U. S. Gov., Federal Specification CCC-B-801; 1931. Amendment 3; 1944. Bunting; Wool. Covers one type and grade. Gives requirements for material, workmanship, weave, width, length of bolt or roll, weight, threads per inch, ply, color, strength, and selvages; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 360, 300.4, 300.6; standard colors, *see* 306.0.

306.43 Cotton Flags

U. S. Gov., Federal Specification DDD-F-416; 1938. Flags; U. S. Covers the grade known commercially as "firsts"; two types—(I) cotton bunting and (II) wool bunting; and twelve classes. Gives requirements for design, color, dimensions, warp, and manufacture; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 35-2A; 1928. Flag; With Shaft, for Decorating Graves.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-3; 1924. Flag and Flag Kit.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-42; 1942. Flag Set M-238, Tank.

U. S. Gov., U. S. Maritime Commission. Specification 5-MC-1; 1941. Flags; Semaphore. Gives requirements for type, grade, sets, materials, workmanship, bunting, weave, finish, color, details, size, staff, design, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 5-MC-3; 1941. Flags; International Code. Gives requirements for types, grade, materials, workmanship, set of flags, size, colors, designs, details, sampling, inspection, and tests. Drawings of alphabet flags and numerical pennants.

306.44 Wool Flags

U. S. Gov., Federal Specification DDD-F-416; 1938. Flags; U. S. Covers the grade known commercially as "firsts"; two types—(I) cotton bunting and (II) wool bunting; and twelves classes. Gives requirements for design, color, dimensions, warp, and manufacture; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, adopted 1943. Flag; Brigadier General, No. 6 and No. 7 Bunting.

U. S. Gov., Marine Corps Specification, adopted 1943. Flag; Major General, No. 6 and No. 7 Bunting.

U. S. Gov., Marine Corps Specification, adopted 1943. Flags of the Commandant; U. S. Marine Corps, Bunting.

U. S. Gov., U. S. Maritime Commission. Specification 5-MC-2; 1941. Flags; Ensign, Jack, and Mail, U. S. (Wool). Gives requirements for types, classes, grade, materials, workmanship, size, details, colors, design, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 5-MC-3; 1941. Flags; International Code. Gives requirements for types, grade, materials, workmanship, set of flags, size, colors, designs, details, sampling, inspection, and tests. Drawings of alphabet flags and numerical pennants.

306.45 Silk Flags

U. S. Gov., Marine Corps Specification, adopted 1939. Flag; Marine Corps Standard.

306.46 Flag Kits

U. S. Gov., U. S. Army, Signal Corps. Specification 72-3; 1924. Flag and Flag Kit.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-9; 1933. Flag Set, Type M-133, International Code.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-32A; 1941. Flag Kit, Type M-26-B, International Code.

307. YARN-DYED OR STOCK-DYED COTTON CLOTH

References.—*See* items under 306.1, 306.2, and 306.3.

308. MISCELLANEOUS COTTON CLOTH

308.1 DAMASK

American Hospital Assn., 67-58. Cotton Table Damask (in Bolts). Covers six types in "firsts." Based on U. S. Gov. Federal Specifications CCC-D-71 for Cotton Table Damask (in Bolts), and CCC-T-191a, and Amendment 1, for General Specifications, Test methods, Textiles.

U. S. Gov., Federal Specification CCC-D-71; 1937. Damask; Table, Cotton (in Bolts). Covers one grade and six types. Gives requirements for weave, finish, tolerances, width, weight, breaking strength, and linting; methods of sampling and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 27 D 10; 1943. Damask; Table, Cotton (in Bolts).

308.2 PILE FABRICS, PLUSHES, VELVETEENS, AND CORDUROYS

American Society for Testing Materials, D625-41T; 1941. Tentative Specifications for Medium-Weight

Cotton Corduroy Fabrics. Two types of medium-weight cotton corduroy faorics for use as boys' clothing. Classification, physical properties, methods of testing.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS103-42; 1942. Cotton and Rayon Velour (Jacquard and Plain). Provides a minimum quality for cotton and rayon velour (jacquard and plain) for upholstery purposes based on colorfastness, anchorage of pile, abrasion resistance, weight of pile, and weight and construction of the fabric. It also includes methods of tests and illustrates the recommended manner in which manufacturers and distributors may guarantee compliance with the Commercial Standard.

U. S. Gov., Navy Dept. Specification 27C30; 1940. Corduroy; Pocketing (Velveteen, Pocketing).

308.3 LINSEY-WOOLSEY

308.4 DAIRY CLOTH

308.5 DIAPER CLOTH

American Hospital Assn., 67-40. Bird's-Eye (Diaper) Cloth in Bolts. Covers one type in "firsts." Based on U. S. Gov. Federal Specifications CCC-C-411 for Bird's-Eye (Diaper) Cloth in Bolts and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-C-411; 1932. Cloth; Bird's-Eye (Diaper), in Bolts. Covers one type and one grade. Gives requirements for finish, weave, width, weight, and thread count; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; diapers, *see* 319.7.

308.6 CONVALESCENT CLOTH

308.7 MOMIE CLOTH

U. S. Gov., Navy Dept. Specification 27C2c; 1934. Cloth; Momie.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-35a; 1943. Cloth; Momie. Shall be type I—combed warp, type II—carded warp, and the grade shall be that commercially known as "first." Gives requirements for materials, workmanship, weave, yarns, thread count, weight, color, width, warp, breaking strength, sampling, inspection, and tests.

308.8 PROCESS CLOTH

308.9 MISCELLANEOUS SPECIFICATIONS FOR COTTON FABRICS

American Society for Testing Materials, D678-42 T; 1942. Tentative Specifications for Finished, All-Cotton, Upholstery Tapestries. Apply to three types of finished, all-cotton tapestry fabrics for use in upholstery furniture—type 1, light-weight tapestries; type 2, medium-weight tapestries; and type 3, heavy-weight tapestries.

Tag Manufacturers Institute. Manual of Standard Specifications. Cloth Stocks and Tag and Label Cloth, 1939. Gives TMI designation, thickness, thread count, tearing strength, tolerance, and various grades.

U. S. Gov., Army Air Forces. Specification 16082; 1932. Gimp; Upholstery.

U. S. Gov., Army Air Forces. Specification 16155; 1944. Cloth; Cotton Mercerized (Water-Repellent and Fireproofed).

U. S. Gov., Army Air Forces. Specification 16159; 1944. Cloth; Cotton, Water and Mildew Resistant.

U. S. Gov., Army Air Forces. Specification 16163; 1944. Fabric; Cotton Chafer.

U. S. Gov., Army Air Forces. Specification 16164; 1944. Fabric; Fire-Resistant Cotton.

U. S. Gov., Federal Specification DDD-C-431; 1939. Cloth; Photo-Mounting. Covers two types—(I) adhesive one side, white, grey, and sepia, and (II) adhesive both sides, white. Gives requirements for color, thickness, thread per inch, tensile breaking strength, and adhesive quality; methods of sampling, inspection, and tests; and requirements for packaging and packing for shipment.

U. S. Gov., Federal Specification DDD-C-471a; 1937. Cloth; Sensitized. Covers one grade and three types—(I) reproduction (semigloss and mat finish), (II) blue process, and (III) brown process. Gives requirements for fabric, quality, waterproofing and sensitizing, finish, permanence, tint, erasing, thickness, flexibility, opacity, printing, and sizing; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, revised 1943. Cloth; Cotton, Camouflage.

U. S. Gov., Marine Corps Specification, adopted 1944. Cloth; Cotton, Plisse, Crinkle, Tan.

U. S. Gov., Marine Corps Specification, revised 1943. Fabric; Impregnated, Camouflage 2-In. by 300-Ft. Rolls (Masslinn).

U. S. Gov., Navy Dept. Specification 27C22f; 1945. Cloth; Jungle.

U. S. Gov., Navy Dept. Specification 27G1b; 1942. Gimp; Buttonhole.

U. S. Gov., Treasury Dept., Procurement Div., 375A; 1942. Broadcloth. Shall be of one type and the grade shall be that known commercially as "firsts." Gives detail requirements as to basic fabric, finished fabric, weight, width, thread count, sizing, breaking strength, finish, length of bolt, colors and patterns, and color fastness; method of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 389; 1939. Pajama Checks; Bleached. Shall be of one type of the grade known as "firsts," made of thoroughly cleaned cotton. Gives requirements for basic and finished fabric, thread count, weight, breaking strength; width and finish; method of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 391A; 1942. Hickory Stripe Cloth. Covers two grades—(A) 6 oz. and (B) 5.2 oz. Gives requirements for weave, color fastness, length of bolt, finish, weight, width, thread count, and breaking strength; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 392; 1939. Covert; Shrunk and Unshrunk. Covers 5 types. Gives requirements for colors and color fastness, width, weight, thread count, breaking strength, sizing, shrinkage, and weave; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 396; 1940. Plisse Crepe. Shall be of one type made of thoroughly cleaned cotton of the grade known as "firsts." Gives requirements for basic and finished fabric, width, thread count, breaking strength, finish, colors, and color fastness; method of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 6-97F; 1943. Cloth; Mercerized Cotton.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-133B; 1938. Gimp; Cotton, Buttonhole.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 78-8; 1932. Cloth; Sponge.

U. S. Gov., Veterans Administration. Specification VA-X-96g; 1944. Warp; Carpet.

U. S. Gov., Veterans Administration. Specification VA-X-97f; 1941. Warp; Cotton, Mercerized.

References.—Waterproof cotton fabric, *see* 392.4; cotton airplane cloth, *see* 396; surgical gauze, *see* 398.2; elastic webbing, *see* 394.5.

309. COTTON KNIT GOODS

309.0 GENERAL ITEMS

American Society for Testing Materials, D 231-39; 1939. Methods of Testing and Tolerances for Knit Goods. For those classes of knit goods which later enter into manufacturing processes; tolerances for width, weight, count, and bursting strength; test specimen, standard conditions, apparatus, and test procedures; moisture regain, grease determination, and percentage of cotton and wool. A.S.T.M. Emergency Alternate Provision EA-D 231, 1944, affected section 13, grease determination.

309.1 GLOVES

References.—Rubber gloves, *see* 203.2, 204.52.

309.2 HOSIERY

National Assn. of Hosiery Manufacturers. Standard Hosiery Color Card. Sets forth colors for hosiery, adopted in advance by the hosiery industry for the anticipated trade.

Textile Color Card Assn. of the U. S., Inc. and National Assn. of Hosiery and Underwear Manufacturers. Standard Hosiery Color Card of America, 1927. Contains 88 hosiery color samples, each color having a name and number. The Assn. also issues seasonable color cards showing standard colors forecast for the season.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C422; 1938. Methods of Testing Hosiery. The purpose of this circular is to describe the methods of test used by the research associates of the National Assn. of Hosiery Manufacturers at the National Bureau of Standards for those concerned with the testing of hosiery. The test methods given in this circular were selected in order to eliminate unnecessary or undesirable variations in the general testing procedure and to eliminate confusion resulting from a diversity of methods.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS46-40; 1940. Hosiery Lengths and Sizes. This standard covers methods of measuring and standard lengths of ladies' hosiery, men's, children's, and infants' hosiery, and method of measuring size of foot. Initiated by National Assn. of Hosiery Manufacturers

U. S. Gov., Federal Specification JJ-H-601; 1932. Hosiery; Measuring-Size. Gives details for measuring size of ladies' hosiery; men's, boys', golf, children's, misses' and infants' ribbed and flat hosiery; infants' and children's socks; and folded cuff lengths of boys' golf and children's 7/8 hosiery.

U. S. Gov., Federal Specification JJ-S-566a. Amendment 1; 1944. Socks; Cotton. Covers one grade and four classes—(A) medium weight, unbleached, bleached, or in colors; (B) mercerized, bleached, or in colors; (C) mercerized, light weight, bleached, or in colors; and (D) heavy weight, mixed colors. Gives requirements for material, workmanship, construction, dimensions, elasticity, colors, finish, pairing, length of ends, and details for each class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 541; 1942. Stockings; Cotton, Rayon (Infants', Misses', and Women's). Covers three types—(I) infants' (cotton, ribbed), (II) misses' and children's (cotton, ribbed mercerized), and (III) women's (full length); and two classes—(A) mercerized cotton and (B) rayon. Gives requirements for material, construction, methods of measuring, dimensions, length of foot, length of leg, size, tolerance, seams, color, shrinkage, finish, pairing, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 309.0, 300.4, 300.6; hosiery boxes, *see* 953.2.

309.3 KNIT COTTON CLOTH

American Hospital Assn., 13-28. Stockinet Cotton Cloth. Covers two types—(I) rib knit and (II) plain or flat knit. Based on U. S. Army Specifications 6-61B for Stockinet Cotton Cloth.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R194-42; 1942. Cotton Jersey Cloth and Tubing for Work Gloves. Lists three weights and two gages. This program was initiated by the Work Glove Institute.

U. S. Gov., Navy Dept. Specification 27C35; 1942. Cloth; Knitted, for Baling.

U. S. Gov., Navy Dept. Specification 55C13; 1921. Cloth; Jersey, Black.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-51B; 1940. Cloth; Cotton, Stockinet.

309.4 KNIT UNDERWEAR

Underwear Institute. Specifications 1-1 to 1-3; 1935. Standard Measurements for Infants' Garments. Gives detailed requirements for measuring bands, shirts, pants, and abdominal bands.

Underwear Institute. Specifications I-IV; 1935. General Methods of Measuring Union Suits. Includes requirements for measuring men's, boys', children's, and women's union suits.

Underwear Institute. Specifications B-1 to B-17; 1935. Standard Measurements for Boys' Garments. Gives detailed requirements for measuring various types of union suits, shirts, drawers, fleece lined sweat shirts, fleece lined sport coats, and knitted polo shirts.

Underwear Institute. Specifications C-1 to C-14; 1935. Standard Measurements for Children's Garments. Gives detailed requirements for measuring various types of union suits, vests, pants, bloomers, panties, and sleeping garments.

Underwear Institute. Specification G-4; 1935. Proposed Plan of Symbols for Designating Different Models. A system of symbols for designating different models or types of knitted underwear to be used in marking underwear boxes.

Underwear Institute. Specifications M-1 to M-23; 1935. Standard Measurements for Men's Garments. Gives detailed requirements for measuring various types of union suits, shirts, drawers, shorts, fleece lined sweat shirts, fleece lined sport coats, and knitted polo shirts.

Underwear Institute. Specifications W-1 to W-15; 1935. Standard Measurements for Women's Garments. Gives detailed requirements for measuring various types of union suits, vests, drawers, bloomers, panties, and balbriggan pajamas.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS33-43; 1943. Knit Underwear (Exclusive of Rayon). Covers standard methods of measuring and standard measurements for knit underwear (exclusive of rayon) for boys, children, infants, men, and women. Gives requirements for cotton—ribbed, flat knit, panel ribbed, swiss ribbed, fleece-lined; wool—worsted, worsted-merino, wool-cotton; various sizes, weights and types of underwear; and includes sport coats, athletic shirts, polo shirts, sweat shirts, and women's sleeping pajamas; recommended underwear box sizes and recommended cone colors for single cotton yarns. Sponsored by Underwear Institute.

U. S. Gov., Federal Specification JJ-D-641; 1933. Amendment 2; 1936. Drawers; Men's, Cotton, Flat-Knit, Light-Weight. Covers one grade known commercially as "first"; ankle length. Gives detail requirements; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJ-D-653; 1936. Amendment 1; 1944. Drawers; Men's, Cotton-Wool, Mixed. Covers one grade, "firsts"; two types—(I) flat knit and (II) ribbed knit; two classes—(A) heavy weight and (B) medium weight; and 15 subtypes. Gives requirements for fabric, thread, sateen, buttons, tape, workmanship, design, sizes and methods of measuring, stitches, seams, stitching, weights per dozen, and shrinkage; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification JJ-U-513; 1932. Amendment 1; 1944. Undershirts; Men's (Cotton, Flat-Knit, Light-Weight). Covers the short sleeves, pull-over type, of the grade known commercially as "firsts." Gives requirements for yarns, thread, workmanship, design and construction, sizes and method of measuring, stitches, seams, stitching, and weight per dozen; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification JJ-U-517; 1936. Amendment 1; 1944. Undershirts; Men's, Cotton-Wool, Mixed. Covers one grade—"firsts"; two types—(I) flat knit and (II) ribbed knit; two classes—(A) heavy weight and (B) medium weight; and 15 subtypes. Gives requirements for fabric, thread, workmanship, design and construction, sizes and methods of measuring, stitches, seams, stitching, weight per dozen, and shrinkage; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Federal Specification JJ-U-531; 1932. Amendment 1; 1935. Underwear; Knit, Standard Sizes (Exclusive of Rayon). Provides standard methods of measurement and standard measurements for knit underwear for the guidance of producers, distributors, and users, in order to eliminate confusion resulting from the diversity of measurements and methods and to provide a uniform basis for guaranteeing full sizes.

U. S. Gov., Federal Specification JJ-U-561; 1933. Union Suits; Men's (Cotton-Wool, Ribbed-Knit, Medium-Weight). Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1943. Undershirts; Men's (Cotton, Flat-Knit, Light-Weight).

References.—Tolerances, methods of testing, definitions, *see* 309.0, 300.4, 300.6; underwear box sizes, *see* 953.2; wool knit underwear, *see* 367.2, rayon knit underwear, *see* 397.12.

310-319 MANUFACTURES OF COTTON FABRIC

310.0 GENERAL ITEMS

American Home Economics Assn. Sponsor, 1941. American Standards Assn., L 11.1-1941. Body Sizes for Boys' Garments. For accurate determination of size a combination of two measurements are necessary, a length and girth or weight. Gives table showing height, hip girth, chest girth, and waist girth for size groups and average age for size groups. Age cannot be used since body size for a given age varies greatly. The two measurements most practical are height and girth of hip. Based on measurements made by Bureau of Home Economics, U. S. Dept. of Agriculture (Misc. Pub. 365) in a WPA project.

American Institute of Laundering. Service Bulletin 34. Washing Formulas. This bulletin describes typical family washing formulas, typical commercial flatwork washing formulas, how to determine the proper number of suds, causes of linting, and causes of graying.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS13-44; 1944. Dress Patterns. To provide definitions, standard classifications, and corresponding body measurements for the guidance of purchasers, distributors, and users in order to eliminate confusion. Gives standard classifications and corresponding body measurements for dress patterns for women, misses, juniors, girls, children, infants, boys, and little boys. Measurements include bust, waist, and hip for women and misses, and socket bone to floor, hip, breast, and waist for all others.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS65-43; 1943. Methods of Analysis and of Reporting Fiber Composition of Textile Products. This standard provides methods of analyzing finished products composed of cotton, rayon, silk, or woolen fiber, and mixtures of two or more of such fibers, and determining the percentage by weight of each kind of fiber present, and the percentage by weight of total sizing, finishing, and other non-fibrous materials; provides methods of reporting on same; includes definitions of these fibers; and illustrates the manner by which testing laboratories may certify that the analyses have been conducted in accordance with the methods of the standard.

U. S. Gov., Dept of Commerce, National Bureau of Standards. Commercial Standard CS121-45; 1945. Women's Slip Sizes. Covers standard methods of measuring, and standard minimum measurements for women's built-up shoulder and strap-type, straight and bias-cut slips. Gives application, general requirements, standard minimum measurements and methods in detail, and gives tables showing standard minimum measurements for women's straight-cut built-up shoulder, and strap-type slips; bias-cut strap-type slips; and combination straight and bias-cut strap-type slips.

U. S. Gov., Marine Corps Specification, adopted 1943. General Specification for Processing Fabrics. (Mildew Proof and Water-Repellent Requirements).

311. COTTON OUTERWEAR

311.1 COATS AND JACKETS, COTTON

American Hospital Assn., 67-34. White Dairy or Hospital Coats and Trousers. Covers one grade. Based on U. S. Gov. Federal Specifications BBB-C-586 for White Dairy or Hospital Coats and Trousers; V-B-871, and Amendment 2, for Buttons; V-T-276b, and Amendment 1, for Cotton Thread; CCC-T-191a, and Amendment 1, for General Specification, Test Methods, Textiles; and DDD-S-751 for Stitches, Seams, and Stitching.

American Standards Assn., L 17.3-1944. Jackets, Shirts, and Aprons (American War Standard). To establish specifications for certain industrial garments for women. Covers types, general requirements, fabrics, sizes, and construction; description, additional details, and table showing sizes for industrial jacket (in-and-outer style), industrial shirt (regular style, shirt-tail model), and industrial apron (long style); and identification and labeling.

U. S. Gov., Army Air Forces. Specification 3171 (2); 1943. Jacket; Mechanic's Arctic, Type D-2.

U. S. Gov., Army Air Forces. Specification 3243; 1945. Jacket; Nurses Flying, Very Light, Type K-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-2; 1944. Jackets; Summer Flying.

U. S. Gov., Federal Specification BBB-C-586; 1936. Coats and Trousers; Dairy or Hospital, White. Covers one grade. Gives requirements for material, buttons, thread, workmanship, design, sizes, proportions, pockets, sleeves, collar, arm shields, edges, seams, button and eyelet holes, facing, belt, and tunnel loops; and methods of sampling, inspection, and tests.

U. S. Gov., Marine Corps Specification, adopted 1944. Coat; Dress, Summer, Officer and Enlisted Personnel (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, revised 1943. Coat; Utility.

U. S. Gov., Marine Corps Specification, adopted 1943. Coat; Utility (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Coat; Service, Summer (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Jacket, Field (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Vest; Alpaca Lined (Marine Corps Women's Reserve).

U. S. Gov., Navy Dept. Specification 37J2; 1940. Jackets; Jungle-Cloth.

U. S. Gov., Navy Dept. Specification 55J3a; 1940. Jackets; Mess-Attendants'.

U. S. Gov., Navy Dept. Specification 55J9a; 1943. Jackets and Trousers; Herringbone-Twill.

U. S. Gov., U. S. Maritime Commission. Specification 55-MC-4b; 1944. Coats; Cooks', White, French, Double-Breasted, Semi-Military Collar. Gives requirements for materials, workmanship, collar, sleeves, cuffs, facings and fittings, eyelets, buttonholes, pockets, hangar loops, reinforcements, hems, seams, stitching, sizes, identification, thread, buttons, and fabric; sampling, inspection, and methods of test; packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 55-MC-6b; 1944. Coats; Messmen's, Single-Breasted, Semi-Military Collar. Covers one grade and two types—(I) hickory and (II) duck. Gives requirements for material, workmanship, collars, sleeves, cuffs, facings and fittings, eyelets, buttonholes, pockets, hangar loops, reinforcements, hems, seams, stitching, sizes, identification, thread, buttons, and details for each type; sampling, inspection, and methods of tests; packaging, packing, and marking for shipment.

311.2 DRESSES AND WAISTS, COTTON

American Standard Assn., L 17.1-1944. Bungalow Aprons, and Wrap-Around and Coat Style Dresses (American War Standard). To establish specifications for certain industrial dresses for women. Covers types, general requirements, fabrics, sizes, and construction; description, additional details, and table showing sizes for industrial bungalow apron, industrial dress (wrap-around style), industrial dress (smock type), and industrial dress (coat style, princess-back model); and identification and labeling.

American Standards Assn., L 17.4-1944. Regular and Princess Model Coat Style Dresses (American War Standard). To establish specifications for certain industrial dresses for women. Covers types, general requirements, fabrics, sizes, and construction; description, additional details, and table showing sizes for industrial dress (coat style, regular model) and industrial dress (coat style, princess model); and identification and labeling.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-17A; 1923. Waist; Cotton, White, Nurses'.

References.—Boys' waists, *see* 311.5.

311.3 WORK CLOTHING

American Hospital Assn., 67-232. Dungaree Trousers. Covers one type only. Based on U. S. Gov., Navy Dept., Specification 55 T 14a for Dungaree Trousers; U. S. Gov. Federal Specifications V-B-871, and Amendment 2, for Buttons; V-T-276b and Amendment 1, for Cotton Thread; CCC-D-151a for Blue Indigo (Fully-Shrunk) Denim; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; and DDD-S-751 for Stitches, Seams, and Stitching; and U. S. Gov., Navy Dept., Specification 27 G 1a for Button Hole Gimp; and 27 T 22 for Garment Tickets.

American Standards Assn., L 17.2-1944. Slacks, Dungarees, Overalls, and Coveralls, (American War Standard). To establish specifications for certain industrial garments for women. Covers types, general requirements, fabrics, sizes, and construction; description, additional details, and table showing sizes for industrial slacks, industrial dungarees, industrial bib overalls (high-back style), industrial bib overalls (low-back style), and industrial coveralls (set-in waistband style); and identification and labeling.

U. S. Gov., Federal Specification BBB-S-786; 1938. Suits; Working, One-Piece. Covers one grade and one type. Gives requirements for material; thread, buttons, buckles, workmanship, design, patterns, stitches, seams and stitching; labels, detailed measurements; and methods of sampling, inspection, and tests.

U. S. Gov., Joint Army-Navy Specification Jan-J-53; 1944. Jumpers; Dungaree.

U. S. Gov., Marine Corps Specification, adopted 1943. Overalls; Utility (Marine Corps Women's Reserve).

U. S. Gov., Navy Dept. Specification 55C32a; 1932. Cover-alls.

U. S. Gov., Veterans Administration. Specification VA-X-131e; 1941. Jumpers; Blue Denim.

U. S. Gov., Veterans Administration. Specification VA-X152g; 1942. Coveralls, Blue Denim.

311.4 PANTS, TROUSERS, AND BREECHES, OF COTTON

American Hospital Assn., 67-235. White Trousers. Covers one type and grade. Based on U. S. Gov., Navy Dept., Specifications 55 T 13c for White Trousers; 27 D 5c for Bleached and Shrunk Drill; 27 G 1a for Buttonhole Gimp; 27 T 11a for Bleached Cotton Tape; and 27 T-22 for Garment Tickets; U. S. Gov. Federal Specifications V-B-871, and Amendment 2, for Buttons; V-T-276b, and Amendment 1, for Cotton Thread; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; and DDD-S-751 for Stitches, Seams, and Stitching.

U. S. Gov., Army Air Forces. Specification 3177 (3); 1944. Trousers; Intermediate Flying, Type A-9.

U. S. Gov., Army Air Forces. Specification 3242; 1945. Slacks; Nurses Flying, Very Light, Type K-1.

U. S. Gov., Federal Specification BBB-C-586; 1936. Coats and Trousers; Dairy or Hospital, White. Covers one grade. Gives requirements for material, buttons, thread, workmanship, design, sizes, proportions, pockets, sleeves, collar, arm shields, edges, seams, button and eyelet holes, facing, belt, and tunnel loops; and methods of sampling, inspection, and tests.

U. S. Gov., Joint Army-Navy Specification Jan-T-52; 1944. Trousers; Dungaree.

U. S. Gov., Marine Corps Specification, adopted 1941. Pants; Baseball.

U. S. Gov., Marine Corps Specification, adopted 1941. Pants; Basketball.

U. S. Gov., Marine Corps Specification, adopted 1932. Pants; Football.

U. S. Gov., Marine Corps Specification, revised 1942. Trousers; Service, Summer.

U. S. Gov., Marine Corps Specification, revised 1944. Trousers; Utility.

U. S. Gov., Marine Corps Specification, revised 1942. Trousers; White.

U. S. Gov., Navy Dept. Specification 37T3; 1940. Trousers; Jungle-Cloth.

U. S. Gov., Navy Dept. Specification 55J9; 1943. Jackets and Trousers; Herringbone-Twill.

U. S. Gov., Navy Dept. Specification 55T13e; 1944. Trousers; White.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-25; 1926. Trousers; Duck (Alaskan Clothing).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-65A; 1936. Breeches; Cotton, Khaki.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-254; 1937. Trousers; Cotton, Khaki.

U. S. Gov., Veterans Administration. Specification VA-X-127j; 1942. Trousers; Cotton, Summer.

References.—Pants for uniforms, *see* 311.6.

311.5 COTTON SHIRTS

American Standards Assn., L 17.3-1944. Jackets, Shirts, and Aprons (American War Standard). To establish specifications for certain industrial garments for women. Covers types, general requirements, fabrics, sizes, and construction; description, additional details, and table showing sizes for industrial jacket (in-and-outer style), industrial shirt, (regular style, shirt-tail model), and industrial apron (long style); and identification and labeling.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS14-43; 1943. Boys' Button-On Waists, Shirts, Junior and Polo Shirts (Made From Woven Fabrics). The purpose is to provide standard methods of measuring and standard minimum measurements for the guidance of producers, distributors, and users. Covers size designations, methods of measuring, and standard minimum measurements for boys' button-on waists, shirts, junior and sport (in or out) shirts, together with a system of button spacing for button-on waists. Initiated by the International Assn. of Garment Manufactures.

U. S. Gov., Federal Specification DDD-S-301; 1937. Shirts; Broadcloth, Cotton, Mercerized. Covers one type and grade. Gives requirements for style, size, color, construction, finished measurements, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-S-306; 1937. Shirts; Chambray, Blue or Green. Covers one type and grade, coat style, with fall collar having V-shaped opening in front. Gives requirements for front, pocket, back, collar, sleeves, buttons, sizes, and material; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1941. Shirt; Baseball.

U. S. Gov., Marine Corps Specification, revised 1942. Shirt; Cotton, Khaki.

U. S. Gov., Marine Corps Specification, revised 1944. Shirt; Cotton, White and Khaki (Marine Corps Women's Reserve).

U. S. Gov., Navy Dept. Specification 27S14; 1941. Shirting; Cotton, Broadcloth and Oxford.

U. S. Gov., Navy Dept. Specification 55S20e; 1944. Shirts; Chambray, Blue.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-241; 1938. Shirt; Cotton, Khaki, Suiting Cloth, 8.2 Oz.

311.6 SUITS AND UNIFORMS, COTTON

U. S. Gov., Army Air Forces. Specification 3232-1; 1944. Suit; Flying, Very Light, Cotton Twill, Type K-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-31a; 1943. Suits; Summer Flying.

U. S. Gov., Federal Specification BBB-S-768; 1938. Suits; Operating (Coats and Trousers). Covers one grade, in small, medium, and large sizes; and three types—(I) with standing collar and short sleeves, (II) without collar and with short sleeves, and (III) without sleeves and without collar. Gives requirements for material, buttons, thread, body of coat, collar, sleeves, pockets, buttons and buttonholes, belt loops, and belt; and methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification BBB-S-776; 1937. Suits; Play, Children's. Covers two types—(I) boys', denim, blue, indigo (shrunk), and (II) girls', covert cloth, cotton. Gives requirements for cloth, thread, buttons, workmanship, finished minimum measurements, construction, sizes, and marking of sizes; and methods of sampling, inspection, and tests.

U. S. Gov., Marine Corps Specification, adopted 1944. Suit; Exercise (Marine Corps Women's Reserve).

U. S. Gov., Navy Dept. Specification 37S7b; 1942. Suits; Wading, Aviation.

U. S. Gov., Navy Dept. Specification 55C31a; 1931. Capes; Navy Nurse Corps.

U. S. Gov., Navy Dept. Specification 55J4b; 1942. Jumpers; Blue, Undress.

U. S. Gov., Navy Dept. Specification 55J5c; 1943. Jumpers; White, Undress.

U. S. Gov., Navy Dept. Specification 55J7b; 1942. Jumpers; Blue, Dress.

U. S. Gov., Navy Dept. Specification 55J8a; 1940. Jumpers; White Dress.

U. S. Gov., Navy Dept. Specification 55U4d; 1942. Uniforms; Navy Nurse Corps, Indoor, White.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3039-A; 1942. Suit; Summer Flying Type A-4.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-278A; 1941. Suit; Convalescent.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-15D; 1941. Uniform; Cotton, Nurses'.

References.—Methods of testing fabrics, *see* 300.4; materials for uniforms, *see* 303.2, 304.4, 306.34, 306.36; wool uniforms, *see* 368.82.

311.7 OPERATING GOWNS

American Hospital Assn., 67-121. Operating Gowns. Covers one type, one grade, and three sizes. Based on U. S. Gov. Federal Specifications DDD-G-601a for Operating Gowns; V-T-276b, and Amendment 1, for Cotton Thread; TT-I-542 for Indelible Marking Ink (for Fabrics); CCC-J-191 for Bleached Jean; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; and DDD-S-751 for Stitches, Seams, and Stitching.

U. S. Gov., Federal Specification DDD-G-601a; 1941. Gowns; Operating. Covers one type and grade and three sizes—large, medium, and small; made of bleached jean. Gives requirements for stitches, seams, body of gown, sleeves, collar, pocket, belt, tying tape, shrinkage, measurements, and size tag; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-S-496; 1938. Smocks; Dental. Covers one grade and three types—(I) standing collar, short sleeves, and fastened down back; (II) V-shaped neck opening, long sleeves, and fastened over right shoulder and down right side; and (III) standing collar, short sleeves, and fastened over right shoulder and down right side. Gives requirements for material, length, chest, armhole, sleeve length, pocket, belt, and tying tapes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 57A4; 1940. Aprons; Operating, Cotton.

References.—Surgeons rubber aprons, *see* 204.51.

311.8 BELTS

U. S. Gov., Army Air Forces. Specification 3221-1; 1944. Suspenders; Flying Suit.

U. S. Gov., Federal Specification DDD-S-811; 1935. Suspenders. Covers one type and grade. Gives requirements for webbing, metal parts, leather parts, and length; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1940. Suspenders; Belt, Web, Model 1936.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-105A; 1942. Belt; Web, Waist, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-181B; 1941. Belt; Pistol or Revolver, M-1936.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-239B; 1941. Suspenders; Belt, M-1936.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-248; 1937. Belt; Web, White, With Shoulder Strap, Army Band.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-286A; 1941. Belt; Magazine, for Browning Automatic Rifle, M-1937.

References.—Methods of testing, *see* 300.4; leather belts, *see* 069.3.

311.9 MISCELLANEOUS COTTON OUTERWEAR

References.—Hats and caps, *see* 395.

311.92 Aprons and Bibs

American Hospital Assn., 67-1. Cooks' Aprons. Covers one type and grade. Based on U. S. Gov., Navy Dept., Specification 55 A 3a for Cooks' Aprons.

American Hospital Assn., 67-4. Cotton Operating Aprons. Covers one type and grade. Based on U. S. Gov., Navy Dept., Specifications 55 A 4 for Cotton Operating Aprons; 55 T 3 for Bleached Cotton Slip Twill; U. S. Gov. Federal Specifications CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; and DDD-S-741 for Stitches, Seams, and Stitching.

American Standards Assn., L 17.1-1944. Bungalow Aprons, and Wrap-Around and Coat Style Dresses (American War Standard). To establish specifications for certain industrial dresses for women. Covers types, general requirements, fabrics, sizes, and construction; description, additional details, and table showing sizes for industrial bungalow apron, industrial dress (wrap-around style), industrial dress (smock type), and industrial dress (coat style, princess-back model); and identification and labeling.

American Standards Assn., L 17.3-1944. Jackets, Shirts, and Aprons (American War Standard). To establish specifications for certain industrial garments for women. Covers types, general requirements, fabrics, sizes, and construction; description, additional details, and table showing sizes, for industrial jacket (in-and-outer style), industrial shirt (regular style, shirt-tail model), and industrial apron (long style); and identification and labeling.

U. S. Gov., Joint Army-Navy Specification JAN- A-54; 1944. Aprons; Bakers, Butchers, and Cooks, With Bibs.

U. S. Gov., Marine Corps Specification, adopted 1944. Apron; Bungalow (Marine Corps Women's Reserve).

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-316; 1943. Apron; Mechanic's, Type B-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3076; 1940. Apron; Laboratory, Type A-2 (Cotton Duck).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3099; 1940. Apron; Mechanic's, Type A-3 (Acidproof).

U. S. Gov., U. S. Maritime Commission. Specification 55-MC-2a; 1942. Aprons; Bib and Waist. Type I—bib, type II—waist; class A—duck, class B—drill, class C—denim, and class D—hickory. Gives requirements for material, workmanship, size, hems, thread and stitches, ties, identification, apron fabric, color, sampling, inspection, and tests.

U. S. Gov., Veterans Admenistration. Specification VA-X-12h; 1942. White Smocks for Ward Maids, Female Mess Attendants, and Female Kitchen Helpers.

U. S. Gov., Veterans Administration. Specification VA-X-13g; 1941. Cook's Aprons.

References.—Rubber aprons, *see* 204.51.

311.93 Gloves and Mittens, Cotton

U. S. Gov., Federal Specification JJ-G-451; 1935. Gloves; Working, Cotton, With Leather-Palm. Covers gauntlet type, one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-JJ-G-451; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for body, palm, outer covering, and pattern.

U. S. Gov., Marine Corps Specification, adopted 1934. Gloves; Cotton, White.

U. S. Gov., Navy Dept. Specification 37 M 10; 1943. Mittens; Waterproof, N-1.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-136A; 1938. Gloves; Cotton, White, M-1936.

References.—Rubber gloves, *see* 203.2, 204.52.

311.94 Leggings

U. S. Gov., Marine Corps Specification, revised 1943. Leggings (Enlisted Men).

U. S. Gov., Navy Dept. Specification 72L1a; 1943. Leggings.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-288; 1940. Leggings; Canvas, Dismounted, M-1938.

311.95 Mackinaws of Cotton

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-104A; 1938. Coat; Mackinaw, Olive-Drab, Enlisted Men's.

311.96 Cotton Cloth Shoes

U. S. Gov., Army Air Forces. Specification 3151 (1); 1944. Shoes; Winter, Type A-14 (Rubber Soled Duck Muckluck).

U. S. Gov., Marine Corps Specification, adopted 1932. Shoes; Basket-Ball.

U. S. Gov., Treasury Dept., Procurement Div., 283A; 1941. Shoes; Tennis or Gymnasium (Oxford Type). Shall be of the low oxford type—men's, boys', youths', womens', misses', and childs'. Gives requirements for uppers, vamp and toe cap, counter, outer sole, inner sole, binding, laces, eyelets, weights, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2875B; 1942. Slipper; Hospital.

311.97 Parka

311.98 Bathrobes, Cotton

311.99 Cotton Outerwear Not Otherwise Classified

U. S. Gov., Marine Corps Specification, adopted 1944. Skirt; Dress, Summer, Officer and Enlisted Personnel (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Skirt; Service. Summer (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1943. Shorts; Athletic.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-208; 1933. Band; Hat, Pyroxylin-Coated Fabric.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-246A; 1944. Insignia; Embroidered.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-282; 1939. Neckties; Cotton Khaki (Washable).

312. COTTON UNDERWEAR

U. S. Gov., Federal Specification DDD-U-551; 1937. Union Suits; Boys' and Men's, Nainsook. Covers one grade and two types—(I) boys', sleeveless (class A, drop seat, and class B, flap seat) and (II) men's, sleeveless, knee length. Gives requirements for material, thread, buttons, minimum measurements in inches, and method of measuring; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

312.1 COTTON DRAWERS

Underwear Institute. Specification IX; 1935. General Methods of Measuring Drawers. Gives requirements for measuring men's, boys', and children's ribbed and flat knit drawers.

U. S. Gov., Marine Corps Specification, revised 1943. Drawers; Nainsook.

U. S. Gov., Navy Dept. Specification 55 D 4h; 1943. Drawers; Nainsook.

U. S. Gov., Navy Dept. Specification 55 S 22a; 1944. Shorts; Cotton, Twill.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-188B; 1936. Drawers; Cotton, Shorts.

References.—Knit underwear, *see* 309.4.

312.2 NIGHTGOWNS

American Hospital Assn., 67-175. Hospital Shirts. Covers one type, one grade, and two sizes. Based on U. S. Gov., Navy Dept., specifications.

U. S. Gov., Federal Specification DDD-N-306; 1938. Nightgowns; Children's and Women's. Covers one grade and four types: (I) Children's, in two classes—(A) flannel, outing, and (B) muslin, bleached; (II) infants, flannel, outing; (III) girls', flannel, outing; and (IV) women's, in two classes—(A) flannel, outing, and (B) muslin, bleached. Gives requirements for sizes and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DDD-N-316; 1937. Nightshirts; Boys' and Men's. Covers two types—(I) muslin, slip-over style, white (class A, boys', and class B, men's); and (II) outing flannel, slip-over style (class A, boys' high neck, buttoned front; class B, boys' U or V neck, without buttons; class C, men's, high neck, buttoned front; and class D, men's U or V neck, without buttons). Gives requirements for breaking strength, colors, threads per inch, and buttons; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-275; 1939. Shirt; Bed, Cotton.

312.3 PAJAMAS

American Hospital Assn., 67-148. Hospital Pajama-Coats and Trousers. Covers five types and four sizes. Based on U. S. Gov. Federal Specifications DDD-P-76 for Hospital Pajama-Coats and Trousers; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, for Textiles; DDD-S-751 for Stitches, Seams, and Stitching; V-T-276b, and Amendment 1, for Cotton Thread; and V-B-871, and Amendment 2, for Buttons.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard Emergency CS(E) 15-43; 1943. Men's Pajamas (Made From Woven Fabric). This standard provides standard methods of measuring and standard minimum measurements for the guidance of producers, distributors, and users, in an effort to conserve essential material, to eliminate confusion resulting from a diversity of measurements and methods, and to provide a uniform basis for guaranteeing full size. Covers size designations, methods of measuring, and standard minimum requirements for men's pajamas, whether made from shrunk or unshrunk fabrics, together with a recommended label for use in guaranteeing full size.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard (Emergency) CS (E) 106-43; 1944. Boys' Pajamas (Made From Woven Fabric). Purpose is to provide standard methods of measuring and standard minimum measurements for the guidance of producers, distributors, and users. Covers size designations, methods of measuring, and standard minimum measurements for boys' pajamas whether made from shrunk or unshrunk fabrics, together with a recommended label for use in guaranteeing full size.

U. S. Gov., Federal Specification, DDD-P-76; 1936. Pajama-Coats and Trousers; Hospital. Covers one grade, five types, and four sizes. Gives requirements for material, measurements, shrinkage, body of coat, collar, sleeves, pockets, frogs, and buttonholes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

312.4 PETTICOATS

312.5 COTTON UNDERSHIRTS

Underwear Institute. Specifications V-VIII; 1935. General Methods of Measuring Shirts, Vests, and

Bands. Includes requirements for measuring men's, boys', and children's shirts; children's and women's vests; and infants' bands and shirts.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-233C; 1942. Undershirt; Summer, Sleeveless.

References.—Knit underwear, *see* 309.4.

312.6 COTTON UNION SUITS

Underwear Institute. Specifications WOV-B1 and WOV-B2; 1935. Standard Sizes and Minimum Measurements for Woven Underwear for Boys' Garments. Gives detailed requirements for shorts and union suits.

Underwear Institute. Specifications WOV-C1; 1935. Standard Sizes and Minimum Measurements for Woven Underwear for Children's Garments. Gives detailed requirements for various types of woven waist suits.

Underwear Institute. Specifications WOV-M1 to WOV-M6; 1935. Standard Sizes and Minimum Measurements for Woven Underwear for Men's Garments. Gives detailed requirements for various types of woven shorts and woven union suits.

313. HANDKERCHIEFS AND LACES

313.1 HANDKERCHIEFS

U. S. Gov., Federal Specification CCC-C-451; 1931. Cloth; Handkerchief, Cotton. Covers two types—(A) medium count and (B) high count. Carded or combed yarns may be used in type (A), and combed yarns in type (B). Gives requirements for weight, thread count, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-H-71a; 1944. Amendment 1; 1944. Handkerchiefs; Cotton. Covers one grade and three classes—(A) high count, (B) medium count, and (C) low count. Gives requirements for material and workmanship, weave, tolerance, thread count, weight, construction, breaking strength, color, finish, dimensions, and hems; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification, DDD-H-74; 1938. Handkerchiefs; Cotton, Bandanna. Covers two types—(I) blue and (II) red; and two sizes—18 by 18 in. and 21 by 21 in. Gives requirements for weave, tolerances, ends, breaking strength, weight per square yard, finish, and color fastness; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

313.2 LACES

References.—Gold and silver lace, *see* 399.9.

314. COTTON BELTING

314.1 FABRIC BELTING

American Petroleum Institute, Div. of Production. Standard No. 1; 1940. Belting Specification. Gives physical and dimensional stipulations on finished belting of the following types—leather, impregnated stitched cotton fabric, solid woven hair, solid woven cotton, balata, rubber, cord, and V-belts and sheaves. Also gives minimum requirements as to tensile strength; minimum and maximum limits for the elongation under definitely prescribed loads, and permissible variations in physical dimensions. Leather belting must meet certain cracking and piping tests, and the adhesion between the piles of rubber and balata belting must meet definite requirements.

American Society for Testing Materials, D 181-42; 1942. Specifications and Methods of Test for Certain Heavy Cotton Fabric for Manufacture of Hose and Belting. Gives scope, physical properties, tolerances for width, weight, count, thickness, crimp, and breaking strength, and procedures for testing in accordance with A.S.T.M. method D 39.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-98. Cinch; Packsaddle

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-180B; 1941. Belt; Cartridge, Cal. .30, M-1923 (Dismounted and Mounted).

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; fabric conveyor belting, *see* 314.3; leather belts, *see* 066.3; rubber belts, *see* 207.

314.3 CONVEYOR BELTING

U. S. Gov., Federal Specification DDD-B-166; 1935. Amendment 2; 1940. Belting; Conveyor or Power-Transmission, Narrow (Stitched-Duck). Covers one grade. Gives requirements for finish, width, thread, splices, breaking strength, construction, stitches, elongation, water absorption, stitching thread, and deflection after accelerated aging test; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-B-171; 1931. Amendment 1; 1936. Belting; Conveyor or Power-Transmission (Stitched-Duck). Covers one grade. Gives requirements for finish, width, weight, thread, stitching thread, seam strip, splices, breaking strength, construction, seams, and stitches; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJ-B-191; 1935. Amendment 2; 1940. Belting; Conveyor or Power-Transmission, Cotton (Solid-Woven). Covers one type and one grade known commercially as "firsts." Gives requirements for material and workmanship, weave, tolerances, fasteners, finish, width, thread count, yarns, thickness, breaking strength, elongation, and water absorption; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 34B3b; 1942. Belting; Conveyor, Ammunition.

References.—*See* references under 314.1.

315. BEDDING

315.0 GENERAL ITEMS

American Hospital Assn., 67-193. Hospital and Institutional Cotton Textiles. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Simplified Practice Recommendation R74-30 for Hospital and Institutional Cotton Textiles.

American Institute of Laundering. Service Bulletin 10. How to Launder Blankets and Comforters. This bulletin furnishes a thorough discussion on the laundering of blankets, including—washing temperatures, sudsing and rinsing time, size of loads, fading and loss of color, spots and stains, soil, laundering of cotton and wool blankets, extraction and drying, binding, mothproofing, and the handling of quilts and comforters.

U. S. Gov , Dept. of Commerce National Bureau of Standards. Simplified Practice Recommendation R74-30; 1930. Hospital and Institutional Cotton Textiles. This recommendation establishes a list of standard sizes for bed pads, pillowcases, sheets, spreads, for adult beds, cribs, and bassinets; bureau scarfs; and bath and hand towels. Initiated by the American Hospital Assn.

315.1 MATTRESSES AND MATTRESS COVERS

315.10 General Items

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS54-35; 1935. Mattresses for Hospitals. This standard covers inner-spring mattresses with hair or cotton filling and curled hair mattresses for hospital use. It sets forth types, classes, grades, and sizes, general and detail requirements covering materials, resiliency of spring units, cleanliness, fastness of color, fastness to crocking, fastness to perspiration, and moisture content. Initiated by the American Hospital Assn. Approved as American Tentative Standard, CS54-35, by the American Standards Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS55-35; 1935. Mattresses for Institutions. This standard covers minimum requirements for curled hair mattresses filled with hair and cotton felt mattresses filled with all-cotton felt for institutional use. It sets forth types, classes, grades, and sizes, general and detail requirements covering materials, cleanliness, fastness of color, fastness to crocking, fastness to perspiration, and moisture content. Initiated by the American Hospital Assn. Approved as American Tentative Standard, CS55-35, by the American Standards Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R2-32; 1932. Bedsteads, Springs, and Mattresses. Bedsteads. This recommendation establishes a schedule of types and sizes of bedsteads covering straight-foot wood and metal beds. Initiated by the National Assn. of Bedding Manufactures and the National Assn. of Furniture Manufacturers.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-13; 1941. Pads; Mattress, Quilted. Shall be but one type and the grade shall be that known commercially as "firsts." Gives requirements for materials, workmanship, felt, fabric, thread count, strength, weight, binding, quilting, size, sampling, inspection, and tests.

U. S. Gov., Navy Dept. Specification 27T6a; 1932. Tufting; Wick, Mattress.

U. S. Gov., Navy Dept. Specification 27T19; 1936. Tufts; Mattress.

315.11 Cotton Felt Mattresses

American Hospital Assn., 1-22. Cotton (Felted) Mattresses. Three types—(I) plain box edge, (II) rolled box edge, and (III) plain edge (not boxed). Two grades—(A) linters and cotton felt and (B) all linters felt. Based on U. S. Gov. Federal Specifications V-M-81a for Cotton (Felted) Mattresses; V-T-276b, and Amendment 1, for Cotton Thread; CCC-T-191a, and Amendment 1, for Textiles, General Specifications, Test Methods; CCC-T-351, and Amendment 1, for Mattress and Pillow Ticking; and DDD-S-751 for Stitches, Seams, and Stitching.

American Hospital Assn., 1-28. Cotton-Felt Inner-Spring Mattresses. Type having springs in individual pockets. Based on U. S. Navy Dept. Specifications 27 M 11a amended by 27 M 11b, for Cotton-Felt Inner-Spring Mattresses; U. S. Gov. Federal Specifications V-T-276b, and Amendment 1, for Cotton Thread; CCC-T-191a, and Amendment 1, for Textiles, General Specifications, Test methods; CCC-T-351, and Amendment 1, for Mattress and Pillow Ticking; and DDD-S-751 for Stitches, Seams, and Stitching.

U. S. Gov., Federal Specification V-M-81a; 1939. Mattresses; Cotton (Felted). Covers three types—(I) with plain box edge, (II) with rolled box edge, and (III) with plain edge, not boxed; and two grades—(A) with linters and cotton felt and (B) with all linters felt. Gives requirements for linters, cotton, felt, ticking, thread, twine, workmanship, mattress ticking case, stitches, seams, and stitching, tufting, labels, standard samples, and sizes and weights; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-V-M-81a; 1942, issued by Procurement Div., Treasury Dept., U. S. Gov., required one grade all-cotton felt, gave detail requirements accordingly, and changed requirements for bales.

U. S. Gov., Navy Dept. Specification 27M9b; 1937. Mattresses; Cotton (Felted), Berth (Chief Petty Officers' and Sick-Bay).

U. S. Gov., Navy Dept. Specification 27M11b; 1940. Mattresses; Inner-Spring, Cotton-Felt.

U. S. Gov., Navy Dept. Specification 27M18; 1945. Mattresses; Cotton-Felt, for Officers.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-20b; 1943. Mattresses; Cotton (Felted). Covers one type and grade. Gives requirements for felt, ticking, workmanship, size, weight, construction, and labeling; sampling, inspection, and methods of test; and packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-34; 1941. Amendment 1; 1942. Mattresses; Inner Spring. Shall be type I—all wire spring unit, free-end coil construction; type II—all wire spring unit, knotted-end coil construction, and shall be of but one grade. Gives requirements for sizes, felt, ticking, sheeting, spring wire, workmanship, distribution of felt, stitching, casing, tufting, mattress construction, edge construction, border construction, corners, lifting straps, labels, and details for each type; sampling, inspection, and methods of test; and packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-38; 1941. Mattresses; Inner Spring (Individual Pockets). There shall be but one type and grade, and the sizes shall be as specified. Gives requirements for materials, spring wire, workmanship, distribution of felt, stitching, casing, tufting, mattress construction, edge construction, border construction, inner spring construction, lifting straps, labels, sampling, inspection, and tests.

References.—Ticking for mattresses, *see* 304.8; standard sizes, *see* 315.10.

315.12 Kapok Mattresses

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-34. Bag; Sleeping, Kapok.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-14; 1941. Mattresses; Kapok. There shall be but one type and the grade shall be that known commercially as "firsts." Gives requirements for materials, workmanship, ticking, design, fastness, weave, thread count, weight, strength, case, edges, seams, stitches, tufting, size, weight, sampling, inspection, and tests.

References.—See references under 315.11.

315.13 Hair Mattresses

References.—Ticking for mattresses, *see* 304.8; standard sizes, *see* 315.10; curled horsehair, *see* 362.1.

315.14 Mattress Cases and Covers

American Hospital Assn., 1-10. Mattress Covers. Covers bleached and unbleached preshrunk cotton sheeting for four types of mattresses, material and workmanship, general requirements, detail requirements, and methods of inspections and tests. Based on U. S. Navy Dept. Specification 27 C 27a for Mattress Covers; U. S. Navy Dept. Specification 27 T 11a for Cotton Tape; U. S. Gov. Federal Specifications V-T-276, and Amendment 1, for Cotton Thread; CCC-T-191a, and Amendment 1, for General Specifications and Test Methods of Textiles; and DDD-S-751 for Stitches, Seams, and Stitching.

U. S. Gov., Marine Corps Specification, revised 1942. Cover; Mattress (Unbleached Drill).

U. S. Gov., Marine Corps Specification, revised 1942. Protector; Drill, for Cotton Mattresses.

U. S. Gov., Marine Corps Specification, revised 1942. Protector; Duck, for Cotton Mattresses.

U. S. Gov., Navy Dept. Specification 27C20b; 1942. Covers; Mattress and Pillow (Hammock).

U. S. Gov., Navy Dept. Specification 27C27c; 1944. Covers; Mattress.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-154A; 1941. Bedsack.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-118D; 1940. Covers; Mattress, Cotton.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-4b; 1944. Covers; Mattress. Shall be two types—(I) box (with tie tapes) and (II) envelope (without tie tapes); three classes—(A) bleached (preshrunk), (B) unbleached (preshrunk), and (C) pin-check (preshrunk); and the grade shall be known commercially as "firsts." Gives requirements for material, workmanship, stitching, seams, identification, shrinkage, and details for each type; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-X-186; 1939. Covers and Pads for Hospital Sectional Mattresses.

References.—Standard sizes of mattress pads, *see* 315.10, 315.0.

315.19 Miscellaneous Mattresses

U. S. Gov., Army Air Forces. Specification 3187A; 1944. Mattress; Pneumatic, Type A-3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3079-B; 1941. Mattress; Pneumatic, Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3174; 1944. Mattress; Feather and Down Filled, Type B-1.

315.2 SHEETS

American Hospital Assn., 67-157. Bleached Cotton Sheets. Covers five types in "firsts." Based on U. S. Gov. Federal Specifications DDD-S-281, and Amendment 1, for Bleached Cotton Sheets; and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Army Air Forces. Specification 3173-B; 1945. Sheet; Cotton, for Type A-3A Sleeping Bag.

U. S. Gov., Federal Specification DDD-S-281a; 1943. Sheets; Cotton, Bleached. Covers one grade, and two classes—(A) 4.6 oz. per sq. yd. (74x66) and (B) 4.2 oz. per sq. yd. (68x60). Gives requirements for material, length and width, tolerance, hems, stitches, sizing, finishing, and other nonfibrous materials; thread count, weight, breaking strength, sizes, hems and stitches; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, revised 1942. Sheet; Bed, Unbleached.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-2a; 1942. Sheets; Cotton. Shall be type I—bleached, type II—unbleached; grade A—high quality, grade B—medium quality; and three classes of hems. Gives requirements for materials, workmanship, weave, size, stitches, identification and marking, sampling, inspection, and test.

References.—Standard sizes, *see* 315.0; tolerances, methods of testing, definitions, *see* 300.4, 300.6; sheeting, *see* 304.7; rubber sheeting, *see* 204.33.

315.3 PILLOWCASES AND PILLOWS

References.—Rubber pillows and cushions, *see* 204.25.

315.30 General Items

315.31 Pillowcases and Sacks

American Hospital Assn., 1-31. Cotton Bleached Pillow Cases. Four types and one grade (i.e. "firsts"). Based on U. S. Gov. Federal Specifications DDD-S-351, and Amendment 1, for Cotton Bleached Pillow Cases; and CCC-T-191a, and Amendment 1, for Textiles General Specifications, Test Methods.

U. S. Gov., Federal Specification DDD-P-351; 1931. Amendment 2; 1942. Pillowcases; Cotton, Bleached. Covers one grade and six types. Gives requirements for thread count, weight, breaking strength, hems, seams, and stitches; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-DDD-P-351; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for seams.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-193A; 1941. Pillow; Sack, Hospital.

U. S. Gov., Marine Corps Specification, revised 1942. Pillowcases; Cotton, Unbleached.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-3a; 1942. Pillowcases; Cotton. Shall be type I—bleached, type II—unbleached; grade A—high quality, grade B—medium quality; and two classes of hems. Gives requirements for materials, workmanship, weave, size, stitches, seams, identification and marking, sampling, inspection, and test.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-5a; 1944. Covers; Pillow. There shall be but one grade of the envelope type in two classes—(A) bleached (preshrunk) and (B) unbleached (preshrunk). Gives requirements for fabric, stitching, seams, hems, fittings, size, and identification; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

References.—Pillow ticking, *see* 304.8; standard kinds and sizes, *see* also 315.0, tolerances, methods of testing, definitions, *see* 300.4, 300.6.

315.32 Cotton Felt Pillows

References.—Pillow ticking, *see* 304.8; standard sizes, *see* 315.30.

315.33 Feather Pillows

American Hospital Assn., 1-37. Feather Pillows. Covers three types—(I) chicken feathers, (II) duck feathers, and (III) goose feathers; and one grade, i.e., "firsts". Based on U. S. Gov. Federal Specifications V-P-356, and Amendment 1, for Feather Pillows; C-F-151a for Feathers; CCC-T-351, and Amendment 1, for Mattress and Pillow Ticking; DDD-S-751 for Stitches, Seams, and Stitching; and V-T-276b, and Amendment 1, for Cotton Thread.

U. S. Gov., Federal Specification V-P-356; 1936. Amendment 2; 1942. Pillows; Feather. Covers one grade in three types—(I) chicken, (II) duck, and (III) goose. Gives requirements for ticking, feathers, thread, workmanship, and labels; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-6; 1940. Pillows; Feather. Shall be type I—feather (goose), type II—feather (duck), and type III—feather (chicken, crushed, curled); and shall be that grade known commercially as "firsts." Gives requirements for materials, workmanship, ticking, seams, size and weight, labels, feathers, odor, brittleness, cleanliness, sampling, inspection, and test.

References.—Feather Pillows, sizes, *see* 315.30.

315.34 Kapok Pillows

References.—Kapok pillows, sizes, *see* 315.30.

315.35 Hair Pillows and Cushions

U. S. Gov., Federal Specification C-C-811; 1934. Amendment 1; 1942. Cushion; Carpet and Rug, Hair-Felt. Covers one type. Gives requirements for hair, burlap, adhesive, felting thickness and weights, and tolerance in weight; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-C-C-811; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed the requirements for cushion and for cotton fabric for the core.

References.—Hair pillows and cushions, sizes, *see* 315.30.

315.4 COUNTERPANES, BEDSPREADS

American Hospital Assn., 67-7. Crinkle Bedspreads. Based on U. S. Gov. Federal Specifications DDD-B-151 for Crinkle Bedspreads and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-181. Cotton Bed Spreads. Covers five types. Based on U. S. Gov., Navy Dept., Specification 27 S 3 for Cotton Bed Spreads.

U. S. Gov., Federal Specification DDD-B-151; 1932. Bedspreads; Crinkle. Covers one grade. Gives requirements for finish, weave, dimensions, weight, thread count, and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 27S3b; 1944. Spreads; Bed, Cotton.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-16; 1940. Counterpanes; Cotton, Crinkled, White. Shall be but one type and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, size, construction, weave, color, sizing, thread count, weight, strength, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-29; 1941. Counterpanes; Cotton, Crochet, Blue and White Patterned. Shall be but one type and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, size, construction, weave, color, sizing, thread count, weight, breaking strength, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-36; 1941. Spreads; Birth (Day). Shall be but one type and grade. Gives requirements for materials, workmanship, size, construction, sides, hems, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-43; 1941. Counterpanes; Cotton, Patterned, Dobby Type. There shall be but one type and the grade shall be known commercially as "firsts." Gives requirements for material, workmanship, identification and markings, size, construction, pattern, weave, thread count, yarn, weight, color, sizing, breaking strength, sampling, inspection, and tests.

References.—Standard sizes, *see* 315.0; tolerances, methods of testing, definitions, *see* 300.4, 300.6.

315.5 BLANKETS

American Hospital Assn., 67-10. Cotton and Cotton-Warp and Wool-Filling Blankets. Covers two types. Based on U. S. Gov. Federal Specifications DDD-B-421a, and Amendment 1, for Cotton and Cotton-Way and Wool-Filling Blankets and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Society for Testing Materials, D 576-40T; 1940. Tentative Specifications for All Wool, All Cotton, and Wool and Cotton Blanketing (Household). Includes eight types of fabrics with requirements for warp and filling, weight, minimum thickness, breaking strength and air permeability, and methods of testing.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-45-S. Blanket; Cotton.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R11-36; 1936. Bed Blanket Sizes. This recommendation establishes a simplified list and 11 sizes of bed blankets (cotton, wool, and cotton and wool mixed). Initiated by the National Assn. of Wool Manufactures.

U. S. Gov., Federal Specification DDD-B-421a; 1934. Amendment 1; 1936. Blankets; Cotton, and Cotton-Warp and Wool-Filling. Covers one grade and two types—(I) all cotton and (II) cotton-warp, wool-filling. Gives requirements for color and patterns, size, weave, thread count, breaking strength, and shrinkage; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-10; 1940, amended 1943. Blankets; Cotton Warp, Wool Filling. Shall be type I—mothproofed, type II—not mothproofed; and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, color and appearance, weave, thread count, breaking strength, weight, size, fiber content, shrinkage, binding, mothproofing, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-12; 1940. Blankets; Cotton Warp, Cotton and Wool Filling. Shall be but one type and the grade shall be that commercially known as "firsts." Gives requirements for material, workmanship, fiber content, color, color fastness, appearance, thread count, strength, weight, size, shrinkage, binding, sampling, inspection, and tests.

References.—Standard sizes and grades of blankets, *see* 369.21.

315.6 SPRING COVERS

315.9 MISCELLANEOUS BEDDING

U. S. Gov., Army Air Forces. Specification 3140-B; 1945. Bag; Sleeping, Type A-3A.

U. S. Gov., Treasury Dept., Procurement Div., No. 685; 1944. Panels; Screen, Cloth (for Hospital Use). Covers one type and one grade. Gives requirements for sizes, material, workmanship, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

316. TABLECLOTHS, NAPKINS, AND SILENCE CLOTHS

316.1 TABLECLOTHS

American Hospital Assn., 67-49. Cotton Table Cloths. Covers six types. Based on U. S. Gov. Federal Specifications DDD-C-481a for Cotton Table Cloths; CCC-D-71 for Cotton Table Damask in Bolts; and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification DDD-C-481a; 1937. Cloths; Table, Cotton. Covers one grade. Gives requirements for sizes, construction, and linting; methods of sampling and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 27T23; 1942. Tablecloths, Napkins, and Doilies; Cotton.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-18a; 1941. Tablecloths and Napkins; Cotton (Damask). Shall be three types and the grade shall be that known commercially as "firsts." Gives requirements, for material, workmanship, weave, patterns, finish, nonfibrous materials, hems, dimensions, identification and marking, construction, linting, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-21; 1941. Tablecloths; Cotton (Red and White Check). Shall be of one type and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, design, color fastness, thread count, strength, weight, hems, size, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-44; 1941. Tablecloths; Cotton, Striped, and "Allover" Patterned, Dobby Types. Type I—twill, type II—satin; class A—stripe patterned and class B—"allover" patterned. Grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, patterns, finish, nonfibrous materials, hems, dimensions, identification and marking, sampling, inspection, and tests.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-128; 1927. Tablecloths; Cotton.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

316.2 NAPKINS

U. S. Gov., Navy Dept. Specification 27T23; 1942. Tablecloths, Napkins, and Doilies; Cotton.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-18a; 1941. Tabkecloths and Napkins; Cotton (Damask). Shall be three types and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, weave, patterns, finish, nonfibrous materials, hems, dimensions, identification and marking, construction, linting, sampling, inspection, and tests.

U. S. Gov., Veterans Administration. Specification VA-X-138d; 1943. Napkins; Cotton.

316.3 SILENCE CLOTHS

U. S. Gov., Navy Dept. Specification 27C11b; 1944. Covers; Table.

316.4 TRAY CLOTHS

317. NETS AND NETTING

317.1 BOBBINET

U. S. Gov., Federal Specification JJ-N-191; 1932. Netting; Mosquito (Unbleached-Bobbinet). Covers one type of the grade known commercially as "first." Gives requirements for material, workmanship, finish, ply, weave, width, length, weight, meshes, and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

317.2 MILLINET

317.3 MOSQUITO BAR NETTING

U. S. Gov., Marine Corps Specification, adopted 1942. Net; Mosquito, Bunk.

U. S. Gov., Marine Corps Specification, revised 1943. Net; Mosquito, Cot, Camouflaged.

U. S. Gov., Marine Corps Specification, adopted 1941. Netting; Mosquito (Unbleached Tricot).

U. S. Gov., Treasury Dept., Procurement Div., No. 501; 1941. Netting; Mosquito. Shall be of one type made of cotton. Gives requirements for weave, width, length, weight, meshes, breaking strength, and finish; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-36C; 1938. Bar; Mosquito.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-47a; 1944. Bars; Mosquito. Shall be two types—(I) olive drab and (II) white; and the grade shall be known commercially as "first." Give requirements for materials, workmanship, construction marquisette, apron fabric, tape, sewing thread, identification and marking, and color; sampling, inspection, and methods of test; and packaging, packing, and marking.

References.—Mosquito bar, *see* 317.1.

317.4 FISH NET

317.5 HAY NET

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-204A; 1938. Net; Hay, M-1918.

317.6 HEAD NET

U. S. Gov., Marine Corps Specification, revised 1943. Net; Mosquito, Head (Camouflaged).

317.7 VOLLEY BALL AND TENNIS NETS

U. S. Volley Ball Assn. Volley Ball Official Guide, VB45. Net. Includes requirements for width, length, mesh size, and material; binding of top, ends, and sides; height; and markers.

317.8 NETS, LAUNDRY BAG TYPE

American Hospital Assn., 46-13. Bag-Type Laundry Nets. Covers two types; one grade. Based on U. S. Gov. Federal Specification, JJ-N-176 for Bag-Type Laundry Nets and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification JJ-N-176a; 1944. Nets; Laundry, Bag-Type. Covers one type and three sizes (1) 10 by 15 in., (2) 12 by 22 in., and (3) 24 by 36 in. Gives requirements for material, workmanship, stitching, cloth construction, net construction, color, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

317.9 MISCELLANEOUS NETS

U. S. Gov., Joint Army-Navy Specification JAN-N-70; 1944. Nets; Cargo (Fiber Rope).

U. S. Gov., Marine Corps Specification, adopted 1943. Net; Camouflage (Flame and Mildew-Resistant).

U. S. Gov., Marine Corps Specification, revised 1944. Netting; Cotton, Marquisette, 1.8 Oz., Camouflaged (Mildew-Resistant and Water-Repellent).

U. S. Gov., U. S. Army, Corps of Engineers. Specification 6-70B; 1939. Nets; Camouflage.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2305A; 1941. Bellows; Net for.

U. S. Gov., Veterans Administration. Specification VA-M-167; 1931. Life Saving Nets.

319. MISCELLANEOUS MANUFACTURES OF COTTON

319.1 COTTON BATTING AND WADDING

U. S. Gov., Federal Specification HH-I-528; 1944. Insulation; Cotton, Batts. Covers one grade and three classes—(a) without backing, (b) backing on one side with moisture-resistant paper, and (c) backing on both sides (one side moisture-resistant paper). Gives requirements for material, workmanship, construction, fire resistance, backing, length and width, thickness, weight, and thermal conductivity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification CCC-C-606; 1941. Cotton-Batting; Nonabsorbent, Unbleached. Covers one type and two grades—(A) 50-percent, 3/4-in. fibers and (B) 50-percent, 1/2-in. fibers. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification CCC-W-51; 1942. Wadding; Cotton, Sheet. Covers one type, one grade, and three sizes—(1) 5 in. by 6 yd., (2) 18 in. by 6 yd., and (3) 36 in. by 6 yd. Gives requirements for material, workmanship, absorbency, tolerance, color, sizing, weight, and formation of roll; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, adopted 1941. Strip; Wadding, Sleeve.

U. S. Gov., Navy Dept. Specification 27W2b; 1940. Wadding; Gray.

319.2 FLAGS AND FLAG KITS

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-243; 1936. Cases; Flag, Duck.

References.—Railway signal flags, *see* 306.43.

319.3 TOWELS AND BATH MATS

American Hospital Assn., 67-52. Turkish Wash Cloths. Covers one type and grade in double face cloths. Based on U. S. Gov. Federal Specifications DDD-C-486 for Turkish Wash Cloths; V-T-276b, and Amendment 1, for Cotton Thread; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; DDD-S-751 for Stitches, Seams, and Stitching; and DDD-T-551, and Amendment 1, for Turkish Towels.

American Hospital Assn., 67-196. Hospital Bath Towel. Covers one type, one grade, and one class. Based on U. S. Gov., War Dept., Specifications 6-152 for Hospital Bath Towel, referred to below.

American Hospital Assn., 67-199. Huck Hand Towel. Covers one type, one class, and one grade. Based on U. S. Gov., War Dept., Specifications 6-153 for Huck Hand Towel, referred to below.

American Hospital Assn., 67-223. Office Huck Towels (With Woven Name). Covers one grade in "firsts." Based on U. S. Gov. Federal Specifications DDD-T-531, and Amendment 2, for Office Huck Towels (With Woven Name); and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-229. Turkish Towels. Covers three types in "firsts." Based on U. S. Gov. Federal Specifications DDD-T-551, and Amendment 1, for Turkish Towels and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-58-S. Towels; hand, cloth.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R119-31; 1931. Fast-Selvage Terry Towels. This recommendation establishes a simplified list of stock sizes of fast-selvage terry towels known as Turkish towels. Initiated by the Cotton Textile Institute.

U. S. Gov., Federal Specification DDD-C-486; 1937. Cloths; Wash, Turkish. Covers one type and grade. Gives requirements for sizes, edges, weight, color, border, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-T-531; 1931. Amendment 2; 1936. Towels; Huck, Office (With Woven Name). Covers one type and one grade. Gives requirements for weave, width and length, weight, threads per inch, sizing, and color; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-T-551; 1933. Amendment 1; 1938. Towels; Turkish. Covers one grade and three types— A, B, and C. Gives requirements for finish, weave, hemming, thread count, weight, dimensions, and breaking strength; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 27 T 4b; 1943. Towels; Officers', Face.

U. S. Gov., Treasury Dept., Procurement Div., No. 692; 1944. Towels; Huck, Cotton, Dental. Shall be of a grade commercially known as "firsts." Gives requirements for material, workmanship, weave, thread count, sizing, shrinkage, color, hem, size, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-8; 1940. Towels; Huck. Types shall be type I—huck (union), type II—huck (cotton), type III—huck (cotton, high count); and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, appearance, bleach, weave, hems, size, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-9; 1940. Mats; Bath, White Cotton. Shall be of one type and grade. Gives requirements for material, workmanship, bleach, weave, hems, thread count, weight, sizing, dimensions, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-11; 1940. Towels; Bath (Turkish). There shall be three types and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, bleach, sizing, weave, hemming, size, tolerance for dimensions, lettering and designs, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-15a; 1941. Towels; Service (Pantry and Waiters' Side). Shall be type I—pantry (bordered)—class I, bleached, class II, unbleached; and type II—waiters' side (bleached, without borders). The grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, weave, fiber, thread count, weight, strength, hems, identification, borders, bleach, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-17; 1941. Towels; Crash (Cook's). Shall be type I—cotton warp and linen filling, type II—all cotton; and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, weave, hems, identification, size, borders, finish, tolerance (thread count), sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-23; 1943. Towels; Glass. Shall be three types of linen and four types of cotton, and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, weave, colored yarns, bleach, hems, identification, size, thread count, strength, fiber, sampling, inspection, and tests.

References.—Towels and toweling, *see* 304.91, 304.92, 304.94; paper towels, *see* 471.3.

319.4 MOPS (WIPERS AND POLISHING CLOTHS)

American Hospital Assn., 67-55. Wiping Cloths. Covers one grade. Based on U. S. Gov. Federal Specifications DDD-C-491 For Wiping Cloths and CCC-T-191a for General Specifications, Test Methods, Textiles.

National Assn. of Waste Material Dealers, Inc. Specifications for Wiping Cloths; 1938. Definitions for six classes by nature of material, color, and size; requirements for washing and sterilization. Conforms to standards of the Sanitary Institute of America.

Sanitary Institute of America. Specifications for Sale of Wiping Cloths (undated). Includes two grades of colored wiping cloths, two grades of white wiping cloths, and two grades of underwear wiper; requirements for sterilization, kinds of cloths allowable, and tare.

U. S. Gov., Federal Specification DDD-C-301; 1932. Cheesecloth; (for) Wiping Purposes (Remnants and Seconds). Covers two types—(I) bleached and (II) unbleached; one grade, and two classes—(A) short lengths or remnants and (B) long lengths. Gives requirements for material, workmanship, weave, finish, width, weight, and lengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-C-441; 1936. Cloths; Polishing. Covers one type and grade. Gives requirements for size, breaking strength, edges, weight, and ends and picks; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DDD-C-491a; 1943. Cloths; Wiping. Shall be type I—white or type II—mixed light-colored. Gives requirements for material, workmanship, weight, size, absorbency, invoice weights, baling, sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification DDD-C-503a; 1942. Amendment 2; 1944. Cloths; Wiping, Cotton, Mixed-Colored and White, Sterilized (for Machinery). Covers two types—(I) white and (II) mixed-colored. Gives requirements for material, workmanship, weight, size, freedom from stains, washing and sterilization, absorbency, invoice weights, and baling; methods of sampling, inspection and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification DDD-T-541; 1932. Towels; Machinery-Wiping. Covers one grade and one type. Gives requirements for finish, weave, width, lengths, weight, thread count, breaking strength, and over-edging; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 433; 1940. Cloths; Dust, Oil-Treated. Shall be made of thoroughly cleaned cotton, not less than 20 x 36 in., or 27 x 26-1/2 in., treated by uniform spraying or other method, with clean mineral oil, perfumed with oil of cedar, pine oil, or similar material. Oil contents shall be not less than 15 percent nor more than 25 percent of the weight of the treated cloth. Gives requirements for thread count, weave and color, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-443-A; 1932. Cloths; Cable Wiping.

References.—Methods of testing, definitions, *see* 300.4, 300.6; cheesecloth for wiping purposes, *see* 304.3; mop sticks, *see* 983.1.

319.5 BAGS

References.—Cloth bags, *see* 957.1; duck for bags, burlap, *see* 303.3, 322.1, 322.2.

319.6 CARPET LINING

U. S. Gov., Federal Specification DDD-L-416; 1936. Lining; Carpet. Covers one type and grade. Gives requirements for width, weight, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Felt, *see* 365.98, 473.2.

319.7 PADS AND DIAPERS

American Hospital Assn., 46-16. Laundry Padding (Stitched-Cotton-Roving). Covers one grade in two types. Based on U. S. Gov. Federal Specification CCC-P-86, and Amendment 1, for Laundry Padding (Stitched-Cotton-Roving), and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-73. Bird's-eye Diapers. Covers one type in "firsts." Based on U. S. Gov. Federal Specifications DDD-D-301 for Bird's-eye Diapers; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; and CCC-C-411 for Bird's-eye (Diaper) Cloth in Bolts.

U. S. Gov., Federal Specification CCC-P-86; 1937. Amendment 1; 1938. Padding; Laundry (Stitched-Cotton-Roving). Covers two types—(A) commercially known as 1/4 in. thick and (B) commercially known as 5/8 in. thick. Gives requirements for width, weight, thickness, length of roll, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-D-301; 1932. Diapers; Bird's-eye. Covers one type and grade. Gives requirements for finish, weave, dimensions, weight, and thread count; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1942. Pads; Shooting, Canvas (Emergency Alternate).

U. S. Gov., Navy Dept. Specification 27P6a; 1942. Pads; Shoulder and Sleeve, White.

U. S. Gov., Treasury Dept., Procurement Div. Specification No. 655; 1944. Pads; Ironing Board. Covers one type and one grade and shall be made of knitted cotton. Gives details for construction including length, width, and thickness; methods of sampling and inspection; and packaging, packing, and marking for shipment.

References.—Surgical operating pads of rubber, *see* 204.53.

319.9 MISCELLANEOUS MANUFACTURED COTTON PRODUCTS

319.90 General Items

American Institute of Laundering. Service Bulletin 6. How To Launder Curtains. This bulletin tells you how to identify and inspect curtains, how to wash and finish curtains, how to tint curtains, and how light attacks curtain fabrics.

319.91 Awnings and Curtains

National Canvas Goods Manufactures' Assn., Inc. Method of Cutting Awnings, undated. Method of cutting awnings, whether they are circular or oval, is just the same. Gives illustrations of cuts Nos. 1, 2, 3, 4, and 5 with instructions for cutting circular awnings.

U. S. Gov., Federal Specification CCC-S-121; 1936. Scrim; Curtain. Covers one type and grade. Gives requirements for ends and picks, tensile strength, weight, width, colors, designs, and bolts; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 24A6a; 1944. Awnings; Ships'.

U. S. Gov., Navy Dept. Specification 24C16a; 1944. Curtains; Awning, Ships'.

U. S. Gov., Navy Dept. Specification 24C25; 1944. Curtains; Shower.

U. S. Gov., Navy Dept. Specification 27C7c; 1944. Curtains; Skylight Screens and Fixtures; Ship.

U. S. Gov., Navy Dept. Specification 55C29b; 1940. Curtains; Trousers.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-152; 1941. Curtain; Gasproof, M1.

U. S. Gov., U. S. Maritime Commission. Specification 24-MC-1; 1940. Curtains; Shower, Bleached Duck. Shall be but one type and grade, of that known commercially as bleached, pre-shrunk, Army duck. Gives requirements for workmanship, finish, weave, yarn, thread count, breaking strength, weight, sizes, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-32a; 1943. Curtains (With Fixtures); Port, Door, and Passageway. Covers three types of curtains and six classes of fixtures. Gives requirements for materials, workmanship, construction, dimensions, hems, thread, stitching, metal fittings, fixtures, installation, sampling, inspection, and tests.

References.—Window shades, *see* 392.23; awning cloth, *see* 303.6.

319.92 Bindings, Braid

U. S. Gov., Federal Specification DDD-B-331; 1937. Amendment 1; 1944. Binding; Cotton, Bias-Cut. Covers three types—(I) cambric, (II) percale, and (III) sateen. Gives requirements for material, workmanship, cutting, sizing, length, width, dyes, thread count, finish, weight, and breaking strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1936. Binding; Bias, Black, 7/8-in.

U. S. Gov., Marine Corps Specification, adopted 1944. Piping; White.

U. S. Gov., Navy Dept. Specification 27B5a; 1942. Braid; Cotton, Black.

U. S. Gov., Navy Dept. Specification 27P2c; 1944. Piping; Cotton, Black.

319.93 Cotton Sleeving

U. S. Gov., Navy Dept. Specification 17S10b; 1944. Sleeving; Insulating, Cotton.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-87; 1942. Sleeving; Cotton.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-610; 1931. Sleeve; Cotton, Cable Splicing.

319.94 Canvas Cots, Hammocks

U. S. Gov., Federal Specification AA-C-571a; 1937. Amendment 1; 1938. Cots; Folding, Canvas. Covers one type and one grade. Gives requirements for length, width, height, woodwork (hickory, birch, rock elm, white ash, beech, red oak, white oak, pecan, or hard maple), steelwork, painting, cover, thread, stitching, and straps; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 24 H 1d; 1943. Hammocks and Hammock Fittings.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2659A; 1941. Hammock; Balkan Frame, Large and Small.

References.—Methods of testing, definitions, *see* 300.4, 300.6; canvas, *see* 303.1.

319.95 Sanitary Napkins

319.96 Horse Blankets

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-47-S. Blanket; Saddle.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-6A; 1937. Cover; Horse, M-1912, With Surcingle, M-1930.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-S6; 1937. Cover; Horse, M1912, Unlined, With Surcingle, M1930, for Emergency Use Only.

319.97 Cards, Straps, and Tape

American Hospital Assn., 67-187. Cotton Tape. Covers six types. Based on U. S. Gov., Navy Dept., Specification 27 T 11a for Cotton Tape and U. S. Gov. Federal Specification CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-190. General Use Bleached, Dyed, or Grey Cotton Tape. Covers one type and grade. Based on U. S. Gov. Federal Specifications DDD-T-86 for General Use Bleached, Dyed, or Grey Cotton Tape and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Society for Testing Materials, D 259-44; 1944. Methods of Testing and Tolerances for Woven Tapes. Apply to silk and cotton tapes. Permissible tolerances in weight, width, thickness, and construction, with requirements for sampling, breaking strength, sizing content, acidity test, quinhydrone pH indicator apparatus, and procedures.

American Society for Testing Materials, D 335-36; 1936. 0.007-In. Cotton Tape for Electrical Purposes. Requirements for uniform woven tape free from "notes" or other impurities, with selvage edge, for sizing, physical properties, tests using A.S.T.M. method D 259, winding, and size of rolls.

Society of Automotive Engineers. Aeronautical Material Specification No. 3810; 1944. Adhesive Tape (Cloth Back). Suitable for application on metal, plastic, paper, paint, and permanent organic protective coatings. Covers application, requirements, test procedure, quality, tolerance, reports, packaging, marking, approval, and rejections. Similar Specification: Army-Navy Aeronautical AN-T-12.

U. S. Gov., Army Air Forces. Specification 16157; 1944. Tape; Tubular Nylon, Cotton Filling.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-12a; 1944. Tape; Adhesive, Moisture-Resistant.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-41; 1943. Tape; Non-Elastic Cotton.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-45; 1944. Tape; Nylon (Cotton Filling).

U. S. Gov., Army-Navy Aeronautical Specification AN-T-48; 1944. Tape; Cotton Surface.

U. S. Gov., Army-Navy Aeronautical Specification AN-DDD-T-91a-2; 1944. Tape; Cotton, Reinforcing.

U. S. Gov., Federal Specification DDD-T-86; 1936. Tape; Cotton, Bleached, Dyed, or Grey (General Use). Covers one type and grade. Gives requirements for construction, physical properties, weave, size of yarns, color, and fastness to weather; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-DDD-T-86; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for construction and sizes.

U. S. Gov., Joint Army-Navy Specification Jan-P-127; 1944. Tape; Adhesive, Pressure-Sensitive, Water-Resistant.

U. S. Gov., Marine Corps Specification, revised 1933. Tape; Identification.

U. S. Gov., Marine Corps Specification, adopted 1935. Tape; Cotton, Khaki, 11/16-In. Wide (Shrunk).

U. S. Gov., Marine Corps Specification, adopted 1935. Tape; Cotton, White, 1/4-In. Wide.

U. S. Gov., Marine Corps Specification, adopted 1936. Tape; Cotton, White, 5/8-In.

U. S. Gov., Marine Corps Specification, adopted 1935. Tape; Cotton, White, 11/16-In. Wide (Shrunk).

U. S. Gov., Navy Dept. Specification 26S1f; 1944. Straps; Standard, Folding-Berth.

U. S. Gov., Navy Dept. Specification 27T11b; 1944. Tape; Cotton.

U. S. Gov., Navy Dept. Specification 27T15; 1933. Tapes; Tufting, Cotton.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-29C; 1941. Tape; Cotton, Serving.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-53; 1938. Tape; Cotton, Reinforcing, for Pyrotechnic Parachutes.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-258A; 1940. Tape; Cotton, Identification Tag.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-300; 1941. Strap; Carrying, for Bag, Canvas, Field, Olive-Drab, M-1936.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-318; 1943. Tape; Ankle, 2 In. (Stock No. 27-T-535).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-319; 1943. Tape; Cotton, Braided (White, Dyed, or Unbleached).

References.—Twine, cord, *see* 302.3, 302.4; insulating tape, *see* 719.56; sash cord, wrapping cord, *see* 302.46, 302.47; adhesive tape, adhesive plaster, *see* 204.12.

319.98 Tents, Tarpaulins, and Wind Sails

National Canvas Goods Manufacturers' Assn., Inc. The "Kamptop" Tent, 1940. Gives specifications and sizes for 15 tent sizes from 5x7 to 18x24 ft. Covers type of door construction, many reinforced construction features, style of eave and construction, method of holding up walls and gables for ventilation, weight of the materials, waterproofing used in the cloth—it does not rub off, absolutely waterproof, so no fly is required, price is really lower than a khaki tent with a fly in a 10 ox. duck, and guaranteed full size and waterproof.

U. S. Gov., Army Air Forces. Specification 26758-B; 1945. Paulin; Waterproof, for Type A-3A Sleeping Bag.

U. S. Gov., Army Air Forces. Specification 40770; 1944. Shelter; Field Maintenance, Type B-4, Glider Repair.

U. S. Gov., Army Air Forces. Specification 40872; 1944. Shelter; Field Maintenance, Type A-4, Portable.

U. S. Gov., Army Air Forces. Specification, 40873; 1944. Shelter; Field Maintenance, Type A-5.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-34-1; 1944. Sails; Life Raft.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS28-32; 1932. Cotton Fabric Tents, Tarpaulins, and Covers. A commercial standard selected and accepted by industry establishing a standard method of marking tents, tarpaulins, and covers to show the original gray goods weight per square yard without reference to finished or loaded weights, also to show type of fabric by markings, such as a single filling duck, etc.

U. S. Gov., Federal Specification K-P-146; 1940. Paulins and Covers; Duck (Tarpaulins). Covers one grade "firsts" and two types—(I) fire, water, and weather resistant and (II) water resistant. Gives requirements for duck, cotton or manila rope, grommets and washers, rings, ferrules, thread, workmanship, size, size tolerances, stitches, seams and stitching, construction, and stamping; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, revised 1943. Paulins; Large (30 by 20 Ft.).

U. S. Gov., Marine Corps Specification, adopted 1944. Paulins; Medium (21Ft. 6 In. by 14Ft. 3 In.).

U. S. Gov., Marine Corps Specification, adopted 1944. Tent; Emergency, First Aid and Blackout.

U. S. Gov., Navy Dept. Specification 24C19; 1944. Covers; Searchlight, Canvas.

U. S. Gov., Navy Dept. Specification 24H2; 1932. Hoods; Hatch.

U. S. Gov., Navy Dept. Specification 24P5a; 1944. Paulins.

U. S. Gov., Navy Dept. Specification 24S6a; 1944. Screens; Bridge.

U. S. Gov., Navy Dept. Specification 24 W 2b; 1943. Wind-Sails.

U. S. Gov., Navy Dept. Specification 27C23; 1933. Cloths; Boat.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3077-A; 1942. Tent; Field Shelter, (One Man), Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-26751-G; 1944. Covers; Waterproof (for Aircraft).

U. S. Gov., U. S. Army, Quartermaster Corps. Specifications 6-77; 1937. Screen; Latrine, and Appliances.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-200A; 1935. Covers; Tarpaulin, and End Curtains for Transport Bodies.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-211; 1936. Cover (Army Field Bake Oven No. 1), Canvas, Dough Trough No. 14A.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-257; 1938. Cover; Army Field Bake Oven No. 1, Canvas, Sponge-Can, M-1938.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-306; 1942. Paulins; Canvas.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-308; 1942. Tent; Shelter Half, M-1941.

U. S. Gov., U. S. Maritime Commission. Specification 24-MC-3; 1944. Covers; Canvas, for 12-In. Signaling Searchlight. Covers one type and one grade. Gives requirements for material, workmanship, construction, duck, sewing thread, cord, grommets, stitches, seams, stitching, and identification and marking; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

References.—Cotton duck, *see* 303.1, 303.5.

319.99 Miscellaneous Specifications for Cotton Goods

American Assn. of State Highway Officials, M73-38. Standard Specifications for Cotton Mats for Curing Concrete Pavements. Gives scope, general requirements, properties, filling material, thread, dimensions, construction, and packing.

American Hospital Assn., 67-178. Hospital Slippers. Covers one type, one grade, one class, and seven sizes. Based on U. S. Gov., War Dept., Specifications 10-2875A for Hospital Slippers; Federal Specifications, CCC-D-651 for Unbleached Drill; CCC-D-761, and Amendment 2, for Plied-Filling-Yarns and Single-Yarns (Flat-Duck) Cotton Duck; CCC-S-281, and Amendment 3, for Narrow Unbleached Cotton Sheeting; CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles; and ZZ-R-601a for Methods of Physical Tests and Chemical Analyses of Rubber Goods.

U. S. Gov., Army Air Forces. Specification 3175-B; 1945. Shell; Outer, for Type A-3A Sleeping Bag.

U. S. Gov., Army Air Forces. Specification 26757-A-1; 1945. Covers; Aircraft Wing and Tail.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 106. Cover; Pack, Large.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 107-S. Cover; Pack, Manta.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 260. Pad; Packsaddle.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 308. Saw, Carrier; Crosscut.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-214. Knapsacks (Packsack).

U. S. Gov., Federal Specification DDD-M-148; 1943. Mats; Cotton (for Concrete-Curing). Covers three classes—(I) 8 oz. fabric, (II) 7 oz. fabric, and (III) 6.1 oz. fabric. Gives physical properties of fabric and methods of sampling, inspection, and tests.

U. S. Gov., Marine Corps Specification, adopted 1944. Case; 3-Pocket, 30-Round for Caliber .45 Magazine.

U. S. Gov., Marine Corps Specification, adopted 1944. Cover With Strap; Handbag, Summer (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1942. Lanyard; Pistol.

U. S. Gov., Marine Corps Specification, revised 1943. Pack; U. S. Marine Corps, M-1941.

U. S. Gov., Marine Corps Specification, revised 1944. Pocket; Magazine, Double-Web (for Pistol and Carbine).

U. S. Gov., Navy Dept. Specification 20C2; 1930. Covers; Battery-Deck.

U. S. Gov., Navy Dept. Specification 23C3d; 1944. Cones; Speed.

U. S. Gov., Navy Dept. Specification 24 C 15a; 1943. Covers; Winch, Canvas.

U. S. Gov., Navy Dept. Specification 24C24; 1944. Covers; Canvas (for Generating Sets).

U. S. Gov., Navy Dept. Specification 27C9; 1932. Covers; Chair, Cotton.

U. S. Gov., Navy Dept. Specification 27C31; 1942. Covers; Chair, Muslin.

U. S. Gov., Navy Dept. Specification 27P1a; 1941. Pillows, Transom, Leather; Covers, Pillow, Transom, Muslin (Unbleached).

U. S. Gov., Navy Dept. Specification 27T22b; 1943. Tickets; Garment, Cap and Hat.

U. S. Gov., Navy Dept. Specification 83C1; 1942. Covers (Aircraft Use); Cockpit, Engine, Tail, Wing.

U. S. Gov., Treasury Dept., Procurement Div., No. 656; 1944. Covers; Ironing Board. Covers one grade and two types—(I) for 54 in. ironing board and (II) for 48 in. ironing board. Gives requirements for sheeting, tape, cord, workmanship, and details for each type; methods of sampling, inspection, and test; and packaging, packing, and marking for shipment.

U. S. Gov. Treasury Dept., Procurement Div., No. 689; 1944. Covers; Bedpan. Covers one type. Gives requirements for material, workmanship, weave, thread count, sizing, color, shrinkage, hem, size, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 690; 1944. Folder; With Bags, for Sterilizing Rubber Gloves. Covers one type. Gives requirements for material, workmanship, folders, bags, stitching, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-162C; 1941. Carrier; Pick-Mattock, Intrenching, M-1910.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-163B; 1941. Carrier; Pack, M-1928.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-S163; 1937. Carrier; Pack, M-1928.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-164B; 1941. Carrier; Shovel, Intrenching, M-1910.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-169B; 1941. Carrier; Ax, Intrenching, M-1910.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-176B; 1941. Haversack; M-1928.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-177B; 1941. Sling; Carrying, Machine-Gun and Ammunition.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-178B; 1941. Pouch; First Aid Packet, M-1924.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-182B; 1941. Pocket; Magazine, Double, Web, M-1923.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-183A; 1941. Pouch; Ammunition, Shotgun.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-184; 1937. Cover (Army Field Bake Oven No.1), Canvas, Breadrack, No.17-A.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-220B; 1942. Covers; Canteen, M-1941, Mounted and M-1910, Dismounted.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-284A; 1941. Carrier; Wire Cutter, M-1938.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-5A; 1937. Cover; Rigging and Pack, Manta.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-S5; 1937. Cover; Rigging, for Emergency Use Only.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-29; 1937. Cover; Cargo and Feed.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-54A; 1942. Cover; Saddle, Phillips' Pack, Cargo and Cavalry.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-646A; 1933. Cover; Types BG-54 and BG-55, for Protection of Radio Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-27; 1926. Panel; Type A1-91 to A1-122, Inc. Signaling.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-29; 1930. Panel; Type A1-123, Weather Block Signal Panel.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-31B; 1943. Panel; AL-124 and AL-125, Ground-to-Aircraft Signaling Panels.

References.—Canvas helmets, *see* 914.5; cotton rags, *see* 390.5; coated fabrics, *see* 392.

320-329 JUTE AND JUTE MANUFACTURES

320. GENERAL ITEMS

American Society for Testing Materials, D 276-43T; 1943. Tentative Methods for Identification of Fibers in Textiles. Covers procedures for the identification of textile fibers used commercially in woven, knit, or braided fabrics. Gives reference samples, reagents, apparatus, considerations for sampling, test specimens, mounting specimens, preliminary examination, procedures for various types of fibers, and enlarged photographs of various fibers.

American Society for Testing Materials, D 541-41; 1941. Methods of Testing and Tolerances for Single Jute Yarn. Definitions, tolerances, and methods of testing.

American Society for Testing Materials, D 681-42 T; 1942. Tentative Methods of Testing and Tolerances for Jute Rove and Plied Yarn for Electrical and Packing Purposes. Apply to plied jute yarn and to single and plied jute rove, both treated and untreated, for electrical and packing purposes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Jute. Covers definition, constants, occurrence, grades, uses, and containers.

321. JUTE AND JUTE BUTTS

321.1 JUTE PACKING

322. FABRICS OF JUTE

322.1 BURLAP

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Burlap and Burlap Bags. Covers definition, properties, forms available, occurrences, grades, specifications, substitutes, uses, and specifications for burlap bags.

U. S. Gov., Federal Specification CCC-B-811; 1932. Amendment 2; 1936. Burlap; Jute. Covers one grade. Gives requirements for weave, tolerances, construction, and width; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-CCC-B-811; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for material.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-56A; 1939. Trace for Igniter Protective Caps.

U. S. Gov., Veterans Administration. Specification VA-X-28g; 1941. Burlap; Jute (Upholstery, for Needle Work, Etc.).

References.—Burlap for bags, *see* 322.2; tolerances, methods of testing, definitions, *see* 300.4, 300.6.

322.2 JUTE BAGGING

References.—Other burlap, *see* 322.1; tolerances, methods of testing, definitions, *see* 300.4, 300.6; cloth bags, *see* 957.1; burlap waste classification, *see* 390.5.

322.3 BALING MATERIAL, JUTE

References.—Burlap, jute bagging, *see* 322.1, 322.2.

324. JUTE YARNS

324.1 JUTE YARNS AND ROVING

325. JUTE CORDAGE

325.1 JUTE CORD

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 14-3A; 1924. Marline; Jute, Tarred.

References.—Standard sizes and varieties, *see* 326.

325.2 JUTE ROPE

U. S. Gov., Federal Specification T-R-592; 1944. Rope; Jute. Covers two types—(I) pure jute rope and (II) mixed jute rope. Gives requirements for fiber, workmanship, strand, turn, weight, strength, circumference, length of coil, condition of rope ends, treatment, and four-strand rope; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Standard sizes and varieties, *see* 326.

326. JUTE TWINE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Twines. Covers general discussion of twine and gives details for jute twines; istle twines, sisal twines, Manila twines, Java sisal twines, Mexican sisal twines, Italian hemp, American hemp, and cotton twines.

Tag Manufacturers Institute. Manual of Standard Specifications. Standard Specifications for Strings, 1939. Gives TMI designation, usual dealers name, technical description according to manufacturers' standards, approximate yards per pound, and strength of cotton and silk cords, and twine and jute twines.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R110-29; 1929. Soft Fiber (Jute) Twine. This recommendation covers standard stock varieties with grades, weights, average tensile strengths, and standard put-ups for fine finished twine, wrapping, sail, sewing, millers, and baling twine, heavy finished (India) twine, compress and ham twine, heavy finished istle twine, tube rope, papermakers' bale rope, pipe-cord, hide rope, box twine, jute rope, and fleece twine.

U. S. Gov., Federal Specification T-T-911; 1930. Twine; Jute. Covers four types—(A) fine India twine (finished), (B) wrapping twine (unfinished), (C) tube rope (unfinished), and (D) heavy India twine (finished). Gives requirements for material and workmanship, color, twist, stranding, plies, lengths per pound, and strengths; methods of sampling, inspection and test; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-T-T-911; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for material to jute and/or vegetable bast or leaf fibers.

References.—Methods of testing, *see* 300.4.

329. MISCELLANEOUS MANUFACTURES OF JUTE

329.1 PADDING

329.2 HORSE BLANKETS

329.3 JUTE WEBBING

329.4 JUTE FELT

References.—Jute and hair felt, *see* 365.98.

330-339 FLAX, HEMP, AND RAMIE

330. GENERAL ITEMS

American Society for Testing Materials, D 276-43T; 1943. Tentative Methods for Identification of Fibers in Textiles. Covers procedures for the identification of textile fibers used commercially in woven, knit, or braided fabrics. Gives reference samples, reagents, apparatus, considerations for sampling, test specimens, mounting specimens, preliminary examination, procedures for various types of fibers, and enlarged photographs of various fibers.

American Society for Testing Materials, D 739-43T; 1943. Tentative Methods of Testing and Tolerances for Spun, Twisted, or Braided Products Made From Flax, Hemp, Ramie, or Mixtures Thereof. These methods apply to treated or untreated yarns, threads, twines, and cords. Gives definitions, tolerances, and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Flax Fiber. Covers definition, derivation, characteristics, uses, grades, packing, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Hemp. Covers definition, derivation, characteristics, uses, grades, packaging, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Sisal (Including Henequen). Covers definition, uses, derivation, grades, containers, shipping regulations, and substitutes.

U. S. Gov., Navy Dept. Specification 21H1a; 1929. Hemp; American.

331. CORDAGE, TWINE AND THREADS

331.1 CORDAGE, FLAX, HEMP, AND RAMIE

331.10 General Items

American Society for Testing Materials, D 738-43T; 1943. Tentative Methods of Testing and Tolerances for Rope (Leaf and Bast Fibers). These methods of testing apply only to rope made from leaf or bast fibers or mixtures of these fibers. Gives definitions, tolerances, sampling, test conditions, weight, circumference, length per turn, dry breaking strength, wet breaking strength, extractable matter, analysis for protective treating materials, and mildew resistance.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T300; 1925. Development of a Standard Bending Test for Rope Yarns. Describes testing machine and gives recommended procedure for making bending test in which the original twist in the yarn is retained during test.

331.11 Fishing Lines

U. S. Gov., Navy Dept. Specification 21L2a; 1943. Line; Fishing.

331.12 Houselines, Hemp

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-92; 1943. Houseline. For use in the communication plant. Gives general requirements, material and workmanship, preservative, physical requirements, inspection and tests, inspection instructions, packing, marking, and warranty. Emergency Alternate 1-A-92 EA; 1944, changed 1-A-92, in order to conserve critical and scarce materials for the war period.

References.—Houseline, *see* 311.16.

331.13 Cordage, Hemp and Ramie

References.—Hemp cordage, *see* 331.16.

331.14 Linen Blocking Cord

U. S. Gov., U. S. Army, Army Air Forces. Specification 15-1D; 1941. Cord; Linen, Waxed, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 15-9; 1926. Cord; Linen, Blocking.

331.15 Ratline, Hemp

References.—Tarred ratline stuff, *see* 331.16.

331.16 Hemp Rope and Tarred Hemp Rope

American Petroleum Institute, Div. of Production. Standard 9-B; 1937. Supplement 1; 1939. Manila Cordage. Covers drilling cables, bull and calf ropes, cat lines, and general use rope; gives physical properties, size, weight, length, tensile strength, lubricant content, weights, sizes, and non-manila fiber.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Rope; Manila. Covers definition, source, manufacture, types, and handling and storage.

U. S. Gov., Federal Specification T-C-621; 1930. Amendment 1; 1938. Cordage; Hemp, Tarred. Covers eight types—(A) ratline stuff, (B) seizing stuff, (C) marline, (D) yacht marline, (E) spun yarn, (F) houseline, (G) roundline, and (H) hambroline. Gives requirements for material and workmanship; number of yarns, weight, and breaking strength of ratline stuff in circumferences of 3/4, 1, 1-1/8, 1-1/4, 1-3/8 and 1-1/2 in. and in seizing stuff in circumferences of 1/2, 5/8, 7/8, and 1 in.; length per pound and breaking strength of marline (navy, common, and medium), spun yarn (2 and 3 yarns), houseline (3-thread), houseline (houseline and navy houseline), roundline (3-thread), and hambroline (3-thread); methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification T-R-601a; 1935. Amendment 2; 1943. Rope; Manila. Covers two grades—(A) first grade and (B) second grade. Gives requirements for kind of fiber, grades of fiber, strand, turn, cordage oil, condition of rope ends, four-strand rope, identification; table showing circumference, diameter (5/8 in. to 4 in.), length of coil, weight, breaking strength, etc., methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Army Air Forces. Specification 16090; 1935. Rope; Manila, Yacht (for Aircraft).

U. S. Gov., Navy Dept. Specification 20L1b; 1921. Clotheslines.

U. S. Gov., Navy Dept. Specification 21c5; 1932. Cordage; Hemp (4-Strand Tarred Rope and Untarred Marline).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-44; 1939. Rope; Picket, Field-Artillery 1 1/4-In. Diameter, 33 Ft. Long.

References.—Grades of fiber, *see* 330; methods of testing, definitions, *see* 331.10, 300.6; sisal rope, *see* 341.2.

331.2 TWINE (FLAX, HEMP, RAMIE)

331.20 General Items

Cordage Institute. Method of Testing for Tensile Strength, Etc. Hard Fiber Wrapping Twine, 1940. Requirements for pendulum type, power-driven testing machine, speed of moving head, capstans, holding of specimen, conditioning for test, number of tests, and yardage determination.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R92-38; 1938. Hard-Fiber Twine and Lath Yarn (Ply and Yarn Goods). This recommendation establishes a list of standard kinds and put-ups for hard fiber twines, covering quality, ply, weight, and tensile strength for laid Manila, laid and twisted Java, laid and twisted New Zealand, and twisted sisal. Initiated by the Cordage Institute.

331.21 Flax Twine

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-18; 1925. Twelve-Ply Cable Sewing Twine. Waxed twine of flax fiber for use in forming wires and cables, size of flax fiber, composition of wax, construction of twine, tests for quantity of wax per yard and for breaking strength.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R136-32; 1932. Flax and Hemp Twine. This recommendation establishes a schedule of stock varieties of fine finished hemp twine and fine unfinished hemp and flax twine; sail and baling. It also gives minimum length per pound and minimum average breaking strength for the various grades of flax and hemp twine.

U. S. Gov., Federal Specification T-L-411; 1930. Amendment 1; 1938. Lines; Shot (for) Line-Throwing-Guns. Covers one grade in three sizes—No. 4, No. 7, and No. 9. Gives requirements for material, number of strands, lay, diameter, circumference, length and weight of coil, length per pound, weight per foot, breaking strength, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing and marking.

U. S. Gov., Federal Specification T-T-891; 1938. Twine; Flax. Covers three types—(I) fine unfinished flax twine, sail and baling, (II) fine finished flax twine, for mattress side stitching, and (III) unfinished flax rope, for wrapping. Gives requirements for material and workmanship; plies, length per pound, and breaking strength of type I; twist, ply, length per pound, and breaking strength of type II; strands, plies, twist, length per pound, and breaking strength of type III; and twists; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-T-T-891; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) permits use of flax, hemp, or ramie, a mixture of these fibers, or cotton.

U. S. Gov., Navy Dept. Specification 21 T 9b; 1943. Twine; Flax, Hemp, or Cotton, Mattress, (for Use in Side Stitching).

U. S. Gov., U. S. Army, Army Air Forces. Specification 15-10A; 1941. Cord; Shock Absorber Serving.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-412A; 1933. Twine; Type RP-11, Linen, Braided.

References.—Standard kinds and put-ups, *see* 331.20; methods of testing, definitions, *see* 331.10, 300.6; other shot lines for line carrying guns, *see* 619.1.

331.22 Hemp Twine

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Twine for Roping Dry Sausage. Twine for Roping Genoa and Salami Sausage. Twine for Sweet Pickled Hams and Picnics. Requirements for size of hemp, number of ply, weight, and tensile strength.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Twines. Covers general discussion of twine and gives details for jute twines; istle twines, sisal twines, Manila twines, Java sisal twines, Mexican sisal twines, Italian hemp, American hemp, and cotton twines.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Official Standards of the U. S. for Grades of Hemp Line and Hemp Tow, 1942. Covers type W milled D.R. hemp line Nos. 1,2,3; below grade type W D.R. milled hemp; type K milled D.R. hemp line Nos. 1,2, and 3; and below grade type K D.R. milled hemp. Gives requirements for cleanliness, strength, quality, length, and color for above type Nos. 1,2, and 3. Also, covers type W D.R. hemp tow Nos. 1,2, and 3; below grade type W D.R. hemp tow; type K D.R. hemp tow Nos. 1,2, and 3; and below grade type K D.R. hemp tow. This specification covers fiber from the plant "Cannabis Sativa" grown in the continental U. S.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R136-32; 1932. Flax and Hemp Twine. This recommendation establishes a schedule of stock varieties of fine finished hemp twine and fine unfinished hemp and flax twine; sail and bailing. It also gives minimum length per pound and minimum average breaking strength for the various grades of flax and hemp twine.

U. S. Gov., Federal Specification T-T-901a; 1934. Twine; Hemp. Covers one type in Nos. 12, 18, 24, 36, 48, and 60. Gives requirements for material and workmanship, finish, length per pound, and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-T-T-901a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) limits jute content.

U. S. Gov., Navy Dept. Specification 21 T 9b; 1943. Twine; Flax, Hemp, or Cotton, Mattress, (for Use in Side Stitching).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 13-5; 1924. Twine; Hemp, American, Sail, Unfinished.

References.—Standard kinds and put-ups, *see* 331.20; methods of testing, definitions, *see* 331.10, 300.6; grades of fiber, *see* 330.

331.24 Marlin Twine

References.—Hemp rope and tarred hemp rope, *see* 331.16.

331.25 Impregnated Twine

U. S. Gov., U. S. Army, Signal Corps. Specification 15-3d; 1943. Twines; RP-13, RP-14, RP-15.

References.—Hemp rope and tarred hemp rope, *see* 331.16.

331.3 THREAD OF FLAX, HEMP, RAMIE

U. S. Gov., Army-Navy Aeronautical Specification AN-T-47; 1944. Thread; Linen and Linen-Hemp.

U. S. Gov., Federal Specification V-T-291a; 1933. Amendment 1; 1944. Thread; Linen. Covers three types—(A) three-cord (stitching), (B) lock-stitch twist, and (C) hand shoe. Gives requirements for material, workmanship, boil-off, and finish; number, length per pound, and strength for three-cord thread; ply, length per pound, strength, and turns per inch for lock-stitch-twist thread; number, length per pound, and strength for hand-shoe thread; color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-X-87b; 1940. Thread; Linen, Weaving.

References.—Methods of testing textile materials, *see* 300.4.

331.4 OAKUM

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Oakum. Covers definition, derivation, uses, grades and types, forms and marketing, and substitutes.

U. S. Gov., Federal Specification T-O-56; 1940. Oakum; Marine. Covers type and grade in two classes—(1) spun and (2) unspun. Gives requirements for kind of fiber, tar content, form, and weight of shipment and tare; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 13-9a; 1939. Oakum; Veterinary.

332. CABLES (HEMP, FLAX, RAMIE)

333. FABRICS OF FLAX

333.2 HOLLANDS, BROWN

U. S. Gov., Navy Dept. Specification 27S15; 1941. Stays; Holland.

U. S. Gov., Navy Dept. Specification 55H2; 1922. Hollands; Brown, 3-Oz., 34-In.

333.3 TOWELING, CRASH, HUCK

American Hospital Assn., 67-208. Crash, Cotton, and Cotton and Linen-Mixed Toweling. Covers two types. Based on U. S. Gov. Federal Specifications CCC-T-571, and Amendment 2, for Crash, Cotton, and Cotton and Linen-Mixed Toweling and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

References.—Mixed cotton and linen crash toweling, *see* 304.91; standard sizes and kinds of towels, *see* 319.3.

333.4 DAMASK, BLEACHED AND UNBLEACHED

333.9 MISCELLANEOUS FABRICS OF FLAX

American Hospital Assn., 67-106. Bleached Linen Duck. Covers one type and grade. Based on U. S. Gov., Navy Dept., Specifications 27 D 7a for Bleached Linen

Duck and U. S. Gov. Federal Specification CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Marine Corps Specification, adopted 1936. Padding; Canvas, Linen (for Officers).

References.—Varnished cambric electrical insulating cloth and tape, *see* 719.56; tracing cloth, *see* 392.12; cambric and holland cloth for window shades, *see* 392.22.

334. FABRICS OF HEMP AND RAMIE

335. COLLARS AND CUFFS OF FLAX

339. MISCELLANEOUS MANUFACTURES OF FLAX, HEMP, AND RAMIE

339.1 HOSE

References.—Rubber, cotton, and linen hose, *see* 202; Hose, *see* 202, 399.6.

339.2 RUGS

References.—Woolen rugs, *see* 366.1.

339.3 TABLE LINEN

American Hospital Assn., 67-133. Table Linen (Doilies, Napkins, and Tablecloths). Covers six types. Based on U. S. Gov. Federal Specifications DDD-L-391a, and Amendment 1, for Table Linen (Doilies, Napkins, and Tablecloths) and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification DDD-L-391a; 1936. Amendment 1; 1937. Linen; Table (Doilies, Napkins, and Tablecloths). Covers a high grade single damask linen, known to the trade as 5-leaf twill construction. Gives requirements for finish, thread count, dimensions, weight, breaking strength, weave, and hems; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-1; 1941. Tablecloths; Linen. Shall be three types and the grade shall be that known commercially as "firsts." Gives requirements for materials, workmanship, finish, weave, hems, dimensions, tolerances, thread count, weight, strength, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-7; 1940. Napkins and Doilies; Linen. There shall be six types and the grade shall be that known commercially as "firsts." Gives requirements for workmanship, finishing materials, sizes, finish, bleach, color, hems, weave, patterns, thread count, weight, strength, sampling, inspection, and tests.

References.—Cotton table cloths and napkins, *see* 316.1, 316.2.

339.4 LINEN TAPE AND REFILLS

U. S. Gov., Federal Specification DDD-T-101; 1932. Amendment 1; 1941. Tape; Linen Finish, Red. Covers one type and grade, 5/16 in. wide. Gives requirements for tolerance and tensile strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Varnished cambric electrical insulating tape, *see* 719.56.

339.5 LINEN TOWELS

339.50 General Items

339.51 Linen Crash Towels

U. S. Gov., Federal Specification CCC-T-571; 1932. Amendment 2; 1938. Toweling; Crash, Cotton, and Cotton and Linen-Mixed. Covers one grade and two types—(A) mixed linen and cotton and (B) all cotton. Gives requirements for weight, thread count, width, breaking strength, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-17; 1941. Towels; Crash (Cook's). Shall be type I—cotton warp and linen filling, type II—all cotton, and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, weave, hems, identification, size, borders, finish, tolerance (thread count), sampling, inspection, and tests.

References.—Standard sizes, *see* 339.50; mixed cotton and linen crash toweling, *see* 304.91.

339.52 Linen Hand Towels

339.53 Linen Dish Towels

American Hospital Assn., 67-217. Crash, Cotton, and Cotton and Linen-Mixed Towels. Covers two types in "firsts." Based on U. S. Gov. Federal Specifications DDD-T-511 for Crash, Cotton, and Cotton- and Linen-Mixed Towels and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

American Hospital Assn., 67-226. Linen Towels (for Drying Glassware). Covers one type in "firsts." Based on U. S. Gov. Federal Specifications DDD-T-536 for Linen Towels (for Drying Glassware), and CCC-T-191a, and Amendment 1, for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification DDD-T-511; 1932. Towels; Crash, Cotton, and Cotton- and Linen-Mixed. Covers one grade and two types—(A) mixed linen and cotton and (B) all cotton. Gives requirements for construction, finish, hems, weight, thread count, dimensions, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-T-536; 1938. Towels; Linen (for Drying Glassware). Covers one grade and one type. Gives requirements for weave, finish, ends and picks, width, length, weight, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 27T8b; 1943. Towels; Glass.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-15a; 1941. Towels; Service (Pantry and Waiters' Side). Shall be type I—pantry (bordered)—class I, bleached, class II, unbleached; and type II—waiters' side (bleached, without borders). The grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, weave, fiber, thread count, weight, strength, hems, identification, borders, bleach, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-23; 1943. Towels; Glass. Shall be three types of linen and four types of cotton and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, weave, colored yarns, bleach, hems, identification, size, thread count, strength, fiber, sampling, inspection, and tests.

339.54 Turkish Bath Towels, Linen

339.6 STREET BLANKETS

References.—Standard sizes of bed blankets, *see* 369.21.

339.7 FLAX PACKING

References.—Flax packing, *see* 707.22.

340-349 MISCELLANEOUS VEGETABLE FIBERS, STRAW, OR GRASS

341. CORDAGE

341.1 MANILA ROPE AND TWINE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Twines. Covers general discussion of twine and gives details for jute twines; istle twines, sisal twines, Manila twines, Java sisal twines, Mexican sisal twines, Italian hemp, American hemp, and cotton twines.

U. S. Gov., Joint Army-Navy Specification JAN-M-69; 1944. Mats; Cargo.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-2A; 1938. Rope; Pack.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-11C; 1942. Rope; Halter Tie, M-1912.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-23A; 1941. Rope; Drag, With Shoulder Strap, M-1918.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-37A; 1940. Picket-Line Set; Pack Artillery.

References.—Manila rope, *see* 331.16; hemp twine, *see* 331.22.

341.2 SISAL ROPE AND TWINE

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Hide Rope. Unoiled, 2-ply, extra fine sisal, pure Java, or Java mixture, with 15 percent Mexican sisal, weight and tensile strength requirement.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Twines. Covers general discussion of twine and gives details for jute twines; istle twines, sisal twines, Manila twines, Java sisal twines, Mexican sisal twines, Italian hemp, American hemp, and cotton twines.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R92-38; 1938. Hard-Fiber Twine and Lath Yarn (Ply and Yarn Goods). This recommendation establishes a list of standard kinds and put-ups for hard-fiber twines, covering quality, ply, weight, and tensile strength for laid Manila, laid and twisted Java, laid and twisted New Zealand, and twisted sisal. Initiated by the Cordage Institute.

U. S. Gov., Federal Specification T-R-631; 1942. Amendment 2; 1944. Rope; Sisal. Covers one grade, firsts. Gives requirements for material, workmanship, strand, turn, condition of rope ends, four-strand rope, and cordage oil; table showing circumference, diameter (3/16 in. to 4 in.), length of coil, weight, breaking strength, etc.; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 19R1c; 1944. Ropes; Dip, and Assemblies.

U. S. Gov., Navy Dept. Specification 23M3a; 1944. Mats, Collision; and Covers.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 13-3; 1924. Twine; Sisal Binder.

References.—Fiber grades, *see* 330; methods of testing, definitions, *see* 331.10, 300.6.

341.3 HENEQUEN ROPE AND TWINE

U. S. Gov., Federal Specification T-R-586; 1942. Amendment 1; 1943. Rope; Henequen and Other Hard Fibers. Covers one grade. Gives requirements for fiber, workmanship, strand, turn, weight, strength, circumference, length of coil, condition of rope ends, cordage oil and table showing circumference, diameter (1/4 in. to 1 in.), length of coil, weight, breaking strength, etc.; methods of sampling, inspection, and test; and packaging, packing, and marking for shipment.

342. STRAW HATS AND HAT MATERIALS

U. S. Gov., Federal Specification DDD-H-136; 1935. Hats; Straw, Men's. Covers two types—(I) soft and (II) stiff. Gives requirements for material, construction, weight, lining, size, band, sweat band, and style; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

342.1 FIBER HELMETS

U. S. Gov., Marine Corps Specification, revised 1944. Helmet: Fibre, Cloth-Covered.

U. S. Gov., Navy Dept. Specification 73H3a; 1943. Helmets; Fiber, Cloth-Covered.

U. S. Gov., Treasury Dept., Procurement Div., 367B; 1941. Hats; Protective. Covers hats with brim suitable for use in industry and mining, constructed to afford maximum protection of wearer's head against falling objects. Hat shall consist of a shell with brim, a lining, and a cradle or hammock suitable for supporting complete hat on wearer's head. Gives requirements for material, total weight, dielectric strength, strength, inflammability, shell, lining, sweatband and padding, cradle, interchangeability, and ventilation; methods of sampling, inspection, and tests; and packaging, packing, and marking.

342.2 STRAW HATS

U. S. Gov., Navy Dept. Specification 55C30; 1927. Hats (Caps; Covers, Hat) Navy Nurse Corps.

344. ARTIFICIAL SILK MANUFACTURES

References.—Rayon and manufactures thereof, *see* 397.

349. OTHER MANUFACTURES OF VEGETABLE FIBERS, STRAW, OR GRASS

349.1 MATS AND MATTING (FIBER, GRASS, STRAW)

U. S. Gov., Federal Specification DDD-M-156a; 1939. Mats; Door, Fiber. Covers one type. Gives requirements for material, weight, sizes, thickness, weave, color, formation and finish, tensile strength, and binding; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-DDD-M-156a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for sizes.

U. S. Gov., Navy Dept. Specification 27M2a; 1934. Matting; Cocoa.

U. S. Gov., Treasury Dept., Procurement Div., 483a; 1942. Mats; Floor, for Chairs. Covers two types—(I) single lip and (II) double lip. Shall be black, brown, or green, unless otherwise specified, and of hard pressed composition fiber. Gives requirements for finish, strength, hardness, serviceability, color fastness, design, weight, width, length, and thickness; methods of sampling, inspection, and tests; and packing and marking.

349.2 KAPOK

References.—Mattress sizes, *see* 315.10.

349.20 General Items

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Kapok Fiber. Covers definition, derivation, sources, uses, shipment, substitutes, and grades.

U. S. Gov., Navy Dept. Specification 27K1b; 1942. Kapok.

U. S. Gov., Treasury Dept., Procurement Div., No. 506; 1941. Kapok. Covers two grades—(A) regular kapok (in original compressed bales) and (B) special kapok (processed). Shall be similar to Javanese kapok. Gives requirements for foreign matter, buoyancy, resiliency, and adulteration; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-30B; 1941. Kapok; Fiber.

349.21 Mattress, Kapok

349.22 Pillows, Kapok

349.23 Kapok Pads and Cushions

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-40; 1941. Pads; Sun Deck, Kapok Filled, Mildew and Water Resistant. There shall be but one type and grade. Gives requirements for materials, workmanship, construction, dimensions, weight, color, water repellancy, mildew resistance, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-41; 1941. Pads; Steamer Chair, Kapok Filled, Mildew and Water Resistant. There shall be but one type and grade. Gives requirements for materials, workmanship, construction, dimensions, weight, color, water repellancy, mildew resistance, sampling, inspection, and tests.

349.24 Kapok Life Coats, Jackets, and Buoys

349.25 Felt, Kapok

Society of Automotive Engineers. Aeronautical Material Specification No. 3291; 1942. Felt; Kapok. For applications where sound and/or heat insulation is required. Gives requirements for composition, physical characteristics, quality, tests, tolerances, approval, and rejections. Similar to U. S. Gov., Army Air Corps, Specification No. 16098.

U. S. Gov., Army Air Forces. Specification 16098 (1); 1939. Felt; Wool-Cotton-Kapok.

349.29 Miscellaneous Kapok

U. S. Gov., Navy Dept. Specification 27K5; 1944. Kapok; Reclaimed.

349.3 RAFFIA

U. S. Gov., Veterans Administration. Specification VA-X-78e; 1941. Raffia.

References.—Pillow sizes, *see* 315.30.

349.4 COCOANUT FIBER

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Coir (Coconut Fiber). Covers definition, derivation and characteristics, uses, grades, packaging, and substitutes.

References.—Sizes, mattress pads, *see* 315.10.

349.5 PIASSAVA FIBER

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Piassava Fiber. Covers definition, derivation, characteristics, grades, uses, packing and shipping, and substitutes.

349.6 VEGETABLE FIBER

Technical Assn. of the Pulp and Paper Industry. Species Identification of Norwoody Vegetable Fibers, Suggested Method T 10 sm-41; 1941. May be identified on the basis of their structure as revealed under the microscope. Covers apparatus, reagents, test specimen, reference standards, procedure, structure of the plant stem, characteristics of individual species, illustrations, and key to fibers.

349.7 TYPHA FIBER

U. S. Gov., Army Air Forces. Specification 16158-1; 1944. Fiber; Typha.

360-369 WOOL AND HAIR AND MANUFACTURES THEREOF

360. GRADES, DEFINITION, AND TESTS OF WOOL

American Society for Testing Materials, D 276-43T; 1943. Tentative Methods for Identification of Fibers in Textiles. Covers procedures for the identification of textile fibers used commercially in woven, knit, or braided fabrics. Gives reference samples, reagents, apparatus, considerations for sampling, test specimens, mounting specimens, preliminary examination, procedures for various types of fibers, and enlarged photographs of various fibers.

American Society for Testing Materials, D 403-44; 1944. Methods of Testing and Tolerances for Woolen Yarns. Includes single or plied yarns, scoured spun-in-oil, semiscoured spun-in-oil, and dry-spun; definitions of terms, tolerances, sampling, standard condition, and determination of moisture regain, yarn number, breaking strength, twist, and extractable matter.

American Society for Testing Materials, D 404-44; 1944. Methods of Testing and Tolerances for Worsted Yarns. Covers single or plied worsted yarn, either dry-spun or oil-spun. Gives material and workmanship, packing and marking, weight of shipment, extractable matter, definitions, tolerances, and methods of testing.

American Society for Testing Materials, D 419-44; 1944. Methods of Test for Fineness of Wool. For loose form, top, or roving, also mohair, alpaca, camel hair, cashmere, vicuna, and rabbit hair. Requirements for sampling, design of wedge ruler, cross-section device and wedge measure, and tests using nature of width method and cross-section method.

American Society for Testing Materials, D 436-37; 1937. Method of Test for Colorfastness of Dyed or Printed Wool, Silk, or Rayon Fabrics to Laundering or Domestic Washing. For washing tests of colored fabrics without use of bleaching agent. Gives apparatus, test specimens, soap solution, procedure, classification, and results.

American Society for Testing Materials, D 461-44; 1944. American Standards Assn., L 16.1-1944. Methods of Testing Wool Felt. For built-up interlocking fibers by mechanical work, moisture and heat, neither woven nor knitted. Gives requirements for standard condition, test condition, length, width, thickness, weight, breaking strength, splitting resistance, chemical analysis, microscopic examination, and special tests.

American Society for Testing Materials, D 472-41; 1941. Specifications and Methods of Test for Fineness of Wool Tops. For untwisted band of wool fibers from which shorter fibers or noils have been removed by combing. Fineness, sampling, and fineness tests; width and cross-section methods.

American Society for Testing Materials, D 508-43; 1943. Methods of Testing and Tolerances for Yarns Spun From Mixed Fibers. Applies to single or plied yarns spun on the woolen, worsted, or cotton system. Gives requirements for material and workmanship, packing and marking, weight of shipment, extractable matter, definitions, tolerances, methods of testing, and determination of wool content.

American Society for Testing Materials, D 519-40; 1940. Method of Test for Fiber Length of Wool. For loose form, top, or roving, also other fibers; requirements for standard condition, moisture equilibrium, wool fiber stapling apparatus, sampling, procedure for test, and calculations.

American Society for Testing Materials, D 584-43; 1943. Method of Test for Hard Scoured Wool in Wool in the Grease (Laboratory Scale Operations). Intended for determining the hard scoured wool content of individual fleeces or similar quantities of grease wool on a laboratory scale. Gives definitions, apparatus, scouring liquor, test conditions, procedure, ether and alcohol extractions, ash calculations, and check tests.

National Assn. of Dyers and Cleaners of the U. S. and Canada. Identification of Fibers, T-145; 1944. For training employees in the identification of textile fibers. Covers natural fibers and synthetic fibers. Gives method of testing and tests for fiber content of pure silk, weighted silk, wool, cotton, regenerated rayon, cellulose acetate rayon, nylon, vinyon, aralac casein, and glass.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcements No. 135. Official Standards of the U. S. for Grades of Wool and Rules and Regulations for Distribution of Practical Forms of Wool and Wool Top Standards Under Wool Standards Act of May 17, 1928, and Amendment Dec. 1939. Covers 12 grades—80's or fine, 70's or fine, 64's or fine, 60's or one-half blood, 58's or one-half blood, 56's or three-eights blood, 50's or one-fourth blood, 48's or one-fourth blood, 46's or low one-fourth blood, 44's or common, 40's or braid, and 36's or braid; rules and regulations for distribution of practical forms of wool standards.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcements No. 135. Official Standards of the U. S. for Grades of Wool Top and Rules and Regulations for Distribution of Practical Forms of Wool and Wool Top Standards Act of May 17, 1928, and Amendment Dec. 1939. Covers 13 grades—80's, 70's, 64's, 62's, 60's, 58's, 56's, 50's, 48's, 46's, 44's, 40's, and 36's. Gives rules and regulations for obtaining practical forms of the official wool top standards, and gives details covering various methods of test for grade.

361. WOOL UNMANUFACTURED

361.1 WOOL

References.—Standard grades, methods of testing wool, *see* 360.

362. HAIR, UNMANUFACTURED

362.1 CURLED HORSEHAIR

American Hospital Assn., 1-19. Curled Horse Hair. Two Types—(A) horse-mane and (B) horse-tail. Material and workmanship, general requirements, detail requirements, and methods of inspections and tests. Based on U. S. Gov. Federal Specification C-H-111 for Curled Horse Hair.

Contracting Plasterers' International Assn. Standard Specification (undated). Includes requirements for hair.

U. S. Gov., Federal Specification C-H-111; 1930. Hair; Horse, Curled. Covers two types—(A) horse-mane and (B) horse-tail. Gives general and detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification, July 1943, changes types substituting mixtures of horse hair, long winter hog hair, cattle tail hair, and Tula fiber.

362.2 CURED MATTRESS HAIR

References.—Curled horse hair, *see* 362.1.

362.3 UPHOLSTERY HAIR

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Hair, for Upholstering.

References.—Curled horse hair, *see* 362.1.

362.9 MISCELLANEOUS HAIR

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Bristle; Hog. Covers definition, uses, grades, specifications and standards, and references.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-5a; 1942. Hair; Bound.

U. S. Gov., Navy Dept. Specification 27H2a; 1945. Hair; Cattle-Tail-Mixture.

U. S. Gov., Navy Dept. Specification 32H1a; 1939. Hair; Curled, Woven on Burlap (Low-Temperature Insulation).

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-27; 1941. Hair; Cattletail, Cattletail and Hog, and Horse Mane and Hog. Covers four types and the grade shall be as specified herein. Gives requirements for cattletail hair, prime winter hog hair, horse mane hair, mixtures of hair, sampling, inspection, and tests.

363. REWORKED WOOL

363.1 WOOL WASTE

U. S. Gov., Federal Specification DDD-W-116; 1931. Waste; Wool, Colored. Covers one grade. Gives requirements for moisture and tare content, gross weight of bale, volume of bale, and tare; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, *see* 360, 300.4; cotton waste, *see* 301.11.

363.2 WORSTED ZEPHYR

U. S. Gov., Navy Dept. Specification 27W7; 1940. Worsted; Zephyr.

364. WOOL, PARTLY MANUFACTURED

U. S. Gov., Treasury Dept., Procurement Div., No.532; 1942. Yarn; Hand Knitting (Worsted). This specification covers three classes—class A, sweater; class B, sock; and class C, shawl.

365. FABRICS WHOLLY OR CHIEFLY OF WOOL AND HAIR

365.0 GENERAL ITEMS

American Society for Testing Materials, D 462-44; 1944. Methods of Testing and Tolerances for Certain Wool and Part Wool Fabrics. For fabrics wholly or in part wool yarn, excluding blankets, pile fabrics, knitted fabrics, and wool felt. Gives classifications, tolerances, methods of physical testing, and methods of chemical analysis for wool content.

American Society for Testing Materials, D 582-41T; 1941. Tentative Method of Test for Resistance of Textile Fabrics and Yarns to Insect Pests. For treated fabrics or yarns which contain wool or other fibers. Test specimens, larvae, procedure, examination, and report.

American Society for Testing Materials, D 583-40T; 1940. Tentative Methods of Test for Resistance of Textile Fabrics to Water. Includes hydrostatic pressure, water penetration (drip), and water absorption (spray) methods. Test liquid, apparatus, specimen, and methods of procedure.

American Society for Testing Materials, D 627-41T; 1941. Tentative Methods of Test for Evaluating Compounds Designed To Increase Resistance of Fabrics and Yarns to Insect Pests. Cover procedures for the evaluation of compounds or treatments designed to protect textile fabrics and yarns from damage by insect pests, such as moths or carpet beetles. They comprehend not only the initial protection furnished by the treatment, but also the permanency of the protection during conditions of ordinary service. These methods were prepared jointly by the American Assn. of Textile Chemists and Colorists and the American Society for Testing Materials.

Textile Color Card Assn. of the U. S., Inc. Standard Ninth Edition Color Card, 1944. A new master color card for all industries and trades. This is not a card presenting fashion colors for but one season only, but it embraces a complete collection of important staple shades having continued popular acceptance. A Research Associate has been established at the National Bureau of Standards to include the calibration of the 216 colors contained in the Ninth Edition of the Standard Color Card of America and the translation of these standards into the language of scientific equivalents and nomenclature.

Textile Color Card Assn. of the U. S., Inc. Woolen Colors, 1944. The 1945 spring season woolen color card of America—44 colors shown in woolen fabrics—featuring sunlight pastels and liberation colors.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS65-43; 1943. Methods of Analysis and of Reporting Fiber Composition of Textile Products. This standard provides methods of analyzing finished products composed of cotton, rayon, silk, or woolen fiber, and mixtures of two or more of such fibers, and determining the percentage by weight of each kind of fiber present, and the percentage by weight of total sizing, finishing, and other nonfibrous materials; provides methods of reporting on same; includes definitions of these fibers; and illustrates the manner by which testing laboratories may certify that the analyses have been conducted in accordance with the methods of the standard.

365.1 WOOLEN CLOTH DESIGNATED BY NAME

365.11 Beaver Cloth

U. S. Gov., Marine Corps Specification, adopted 1942. Cloth; Beaver, Green, 30-Oz.

365.12 Bedford Cord and Whipcord

U. S. Gov., Marine Corps Specification, adopted 1926. Bedford Cord; Green, 24-Oz. (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1926. Whipcord; Green, 13-Oz. (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1926. Whipcord; Green, 20-Oz. (for Officers).

U. S. Gov., Treasury Dept., Procurement Div., No. 402; 1940. Whipcord; Shrunk and Unshrunk. Covers two types—(I) shrunk, 8.5 oz. and 10.0 oz., and (II) unshrunk, 7.9 oz. and 9.5 oz.; made of thoroughly cleaned cotton, shall have a clear face and light napped back with a medium soft handle and finish. Gives requirements for colors, color fastness, weight, thread count, breaking strength, width, shrinkage, and sizing; methods of sampling, inspection, and test; and packaging, packing, and marking.

365.13 Broadcloth

U. S. Gov., Marine Corps Specification, adopted 1926. Broadcloth; Black (for Trimmings).

References.—Tolerances, methods of testing, definitions, *see* 365.0, 300.4, 300.6.

365.14 Doeskin Cloth

U. S. Gov., Marine Corps Specification, adopted 1926. Doeskin; Dark Blue (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1941. Doeskin; Sky Blue, 17-Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-129; 1941. Cloth; Wool, Doeskin, Olive-Drab, 26-Oz.

365.15 Fearnaught Cloth

365.16 Kersey

U. S. Gov., Marine Corps Specification, revised 1936. Kersey; Dark Blue, 15- to 16-Oz.

U. S. Gov., Marine Corps Specification, revised 1941. Kersey; Green, 16-Oz.

U. S. Gov., Marine Corps Specification, revised 1936. Kersey; Green, 22-Oz.

U. S. Gov., Marine Corps Specification, revised 1936. Kersey; Sky-Blue, 16-Oz.

U. S. Gov., Navy Dept. Specification 27K2c; 1944. Kersey; Blue (Dark), 30-Oz.

U. S. Gov., Navy Dept. Specification 27K3b; 1941. Kersey; Scarlet.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-20A; 1928. Kersey; Olive-Drab, 26-Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-85; 1930. Cloth; Kersey, Sky Blue.

References.—Tolerances, methods of testing, definitions, *see* 365.0, 300.4, 300.6.

365.17 Melton

U. S. Gov., Navy Dept. Specification 27M10c; 1943. Melton; Blue (Dark), 16-Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-135; 1943. Cloth; Wool, Melton, Lining, 30-Oz., O.D.

365.18 Serge

U. S. Gov., Army Air Forces. Specification 16152 (1); 1944. Cloth; Worsted Serge.

U. S. Gov., Marine Corps Specification, adopted 1933. Serge; Dark Blue, 15-Oz.

U. S. Gov., Marine Corps Specification, adopted 1943. Serge; Green, 12-Oz.

U. S. Gov., Marine Corps Specification, adopted 1926. Serge; Green, 16-Oz. (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1926. Serge; Green, 20-Oz. (for Officers).

U. S. Gov., Marine Corps Specification, revised 1938. Serge; Sky Blue.

U. S. Gov., Navy Dept. Specification 27S10b; 1944. Serge; Blue, Dark.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-94B; 1944. Cloth; Wool, Serge, 18 Oz.

References.—Tolerances, methods of testing, definitions, *see* 365.0, 300.4, 300.6.

365.19 Miscellaneous Woolen Cloth

National Assn. of Wool Manufacturers. Bulletin of the Wool Manufacturers for 1943. Reprints complete specifications for woolen products as follows: U.S. Army Specifications, U. S. Navy Specifications, U. S. Marine Corps Specifications, and Federal Specifications.

U. S. Gov., Army Air Forces. Specification 16161; 1944. Cloth; Napped Wool.

U. S. Gov., Army Air Forces. Specification No. 16167; 1944. Cloth; Knitted Wool, for Flying Clothing.

U. S. Gov., Marine Corps Specification, adopted 1942. Cloth; Alpaca Pile, 14.50 Oz. per Sq. Yd. (for Lining Coats).

U. S. Gov., Marine Corps Specification, adopted 1943. Cloth; Gabardine, 14-Oz.

U. S. Gov., Marine Corps Specification, adopted 1926. Lining; Overcoat (for Officers).

U. S. Gov., Navy Dept. Specification 27A1; 1931. Alpaca; Lining, Black.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-234-A; 1943. Cloth; Gabardine, Olive-Drab (Worsted Warp-Cotton Filling).

U. S. Gov., U. S. Army, Army Air Forces. Specification 8-136; 1943. Fabric; Wool, Pile, Coated.

U. S. Gov., U. S. Army, Army Air Forces. Specification 8-142; 1944. Cloth; Alpaca and Wool Pile.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-65; 1928. Elastique; Drab, 26 Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-80; 1941. Cloth; Wool, Worsted Warp-Woolen Filling.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-88; 1930. Cloth; Elastique, 26-Oz., Sky Blue and Dark Blue.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-122A; 1942. Cloth; Woolen, Covert, 12-1/2 Oz.

365.2 WOOLEN CLOTH DESIGNATED BY COLOR

365.21 Dark Blue Cloth

U. S. Gov., Marine Corps Specification, revised 1939. Cloth; Dark Blue, 16-Oz.

U. S. Gov., Navy Dept. Specification 27C19a; 1933. Cloth; Blue (Dark), for Officers' Uniforms.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-84; 1930. Cloth; Dark Blue (17 90 18 Oz.).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-112; 1937. Cloth; Woolen, Blue, Face Finished, for Officers' Uniforms.

References.—Dark blue serge, *see* 365.18; blue broadcloth, *see* 365.13; dark blue kersey, *see* 365.16.

365.22 Light Blue Cloth

References.—Blue broadcloth, blue serge, *see* 365.13, 365.18.

365.23 Scarlet and White Cloth

U. S. Gov., Marine Corps Specification, adopted 1937. Cloth: Scarlet.

365.24 Olive Drab

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8S-39A; 1936. Suiting; Olive-Drab, 20-Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-53-A; 1942. Cloth; Overcoating, Olive-Drab, 32 Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-94B; 1944. Cloth; Wool, Serge, 18 Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-109; 1937. Cloth; Elastique, Olive-Drab, 18-Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-110; 1937. Cloth; Shirting, Worsted, Olive-Drab.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-118; 1940. Cloth; Lining, Wool, Knitted, O. D.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-131; 1942. Cloth; Wool, Knitted, Tubular, O. D.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-134; 1943. Cloth; Wool, Knitted, 26-Oz., O. D.

365.25 Gray Uniform Cloth

365.26 Forestry Green and Elastique Green Cloth

U. S. Gov., Marine Corps Specification, adopted 1944. Cloth; Tropical Worsted, Green.

U. S. Gov., Marine Corps Specification, adopted 1943. Covert; Green, 14-Oz.

U. S. Gov., Marine Corps Specification, revised 1943. Elastique; Green, 16-Oz.

U. S. Gov., Marine Corps Specification, adopted 1942. Elastique; Green, 19-Oz.

U. S. Gov., Marine Corps Specification, revised 1943. Elastique; Green, 21-Oz.

365.27 Khaki Woolen Cloth

U. S. Gov., Marine Corps Specification, adopted 1944. Cloth; Tropical Worsted, Khaki.

365.29 Miscellaneous Cloth Designated by Color

U. S. Gov., Marine Corps Specification, adopted 1937. Cloth; Yellow.

365.9 MISCELLANEOUS SPECIFICATIONS FOR WOOL AND HAIR CLOTH

365.91 Billiard Cloth

U. S. Gov., Navy Dept. Specification 27C1d; 1938. Cloth; Billiard.

365.92 Bunting

References.—Wool bunting, *see* 306.42.

365.93 Flannel

U. S. Gov., Marine Corps Specification, revised 1942. Flannel; Green, 13-Oz.

U. S. Gov., Marine Corps Specification, adopted 1926. Flannel; Scarlet.

U. S. Gov., Marine Corps Specification, revised 1939. Flannel; Shirting, Khaki.

U. S. Gov., Navy Dept. Specification 27C21a; 1940. Flannel (and Cloth), Gray (Prison).

U. S. Gov., Navy Dept. Specification 27F8c; 1943. Flannel; Blue (Dark).

U. S. Gov., Treasury Dept., Procurement Div., No. 531; 1942. Flannel; Wool, and Wool-Cotton. Covers one grade, two types—(I) 75 percent wool and (II) 100 percent wool; and two classes—(A) heavy weight and (B) light weight. Intended for use in making layettes and for demonstration purposes in vocational schools. Gives requirements for material, workmanship, weave, colors, color fastness, length of bolt, width, thread count, breaking strength, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-42A; 1933. Flannel; Gray, Woolen.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8S-54A; 1927. Flannel; Shirting, Olive-Drab, Substitute, 10-Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-54C; 1941. Cloth; Shirting, Flannel, 10-1/2 Oz.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-133; 1943. Cloth; Wool, Flannel.

References.—Cotton flannel, *see* 304.2.

365.94 Prisoners' Uniform Cloth

365.95 Facing Cloth for Uniforms

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-43B; 1940. Cloth; Facing, 16/17-Oz.

365.96 Haircloth

U. S. Gov., Army Air Forces. Specification 16083; 1932. Cloth; Camel Hair, for Flying Suit Linings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T231; 1923. Tentative Standard Test Methods and Percentages of Oil and Moisture in Hair Press Cloths. For press cloth used in the oil pressing industry, procedure for sampling; for analysis for moisture content, oil content, and water-soluble material; recommended standard for permissible content of moisture, oil, and water-soluble material.

U. S. Gov., Marine Corps Specification, adopted 1936. Haircloth; Natural (for Officers).

U. S. Gov., Navy Dept. Specification 55F8a; 1942. Fronts; Coat.

References.—Methods of testing, *see* 365.98; hair felt, *see* 365.98.

365.97 Mohair, and Pile Fabrics

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS52-35; 1935. Mohair

Pile Fabrics (100 Percent Mohair Plain Velvet, 100 Percent Mohair Plain Frieze, and 50 Percent Mohair Plain Frieze). This standard covers the following mohair pile fabrics for upholstery purposes—100 percent mohair plain velvet, 100 percent mohair plain frieze, and 50 percent mohair plain frieze.

U. S. Gov., Marine Corps Specification, adopted 1926. Lining; Mohair Serge, Black (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1926. Lining, Mohair Serge, Green (for Officers).

365.98 Felt

American Hospital Assn., 58-4. Hair Felt. Covers one grade and one class, that intended for pipe covering. Based on U. S. Gov., Navy Dept., Specification 32 F 2b for Hair Felt.

American Society for Testing Materials, D 146-44 T; 1944. Tentative Methods of Testing Felted and Woven Fabrics Saturated With Bituminous Substances for Use in Waterproofing and Roofing. Covers fabrics saturated (but not coated) with asphalt or coal-tar products for use in membrane waterproofing. Sampling, requirements of finished fabric as to area, weight, loose surfacing, moisture, strength pliability, water absorption, loss on heating, and distillation of coal-tar saturated felt, and for desaturated fabric, weight, carbonaceous matter, total comminuted surfacing, saturant, and ash.

American Society for Testing Materials, D 224-44 T; 1944. Tentative Specifications for Asphalt Roofing Surfaced With Powdered Talc or Mica. Cover asphalt roofing in sheet form surfaced with finely powdered mineral matter, either 36 or 32 in. in width, composed of roofing felt saturated and coated on both sides with asphalt. Manufacture, character of felt, saturant, and coatings; physical properties, freedom from defects, pliability and stickiness, packing, nails and lap-cement, sampling and methods of testing, inspection, and basis of rejection. A. S. T. M. Emergency Alternate Provision EA-D 224b; 1944, omits requirements for protective coating on nails, section 12a, item 2.

American Society for Testing Materials, D 225-44 T; 1944. Tentative Specifications for Asphalt Shingles Surfaced With Coarse Mineral Granules. Cover asphalt roofing in shingle form surfaced with colored mineral granules, composed of roofing felt saturated and coated on both sides with asphalt and surfaced on the weather side with granulated slate or equivalent mineral material (of solid or mixed colors as may be agreed upon by the purchaser and the seller), and on the reverse side with powdered talc or mica. Intended to be used with a "headlap" of not less than 2 in. Individual (American Method) Square Tab Strip and Hexagonal Tab Strip. Manufacture, character of felt, saturant, and coatings; physical properties, surface finish, saturation, freedom from defects, stickiness, packing, sampling, and methods of testing, inspection, and basis of rejection.

American Society for Testing Materials, D 228-44 T; 1944. Tentative Methods of Testing Asphalt Roll Roofing, Cap Sheets, and Shingles. Includes roll roofing coated with powder, surfaced with granules, on weather side, and coated on exposed half of the weather side with mineral granules; requirements for sampling; methods of physical testing for roll roofing, cap sheets, and shingles, and for analysis of roofing composition, saturant in dry felt; weight of weather side coating and reverse side coating soluble in carbon disulfide; ash; weight of dry saturated felt and of mineral matter.

American Society for Testing Materials, D 249-44 T; 1944. Tentative Specifications for Asphalt Roofing Surfaced With Coarse Mineral Granules. Cover asphalt roofing in sheet form surfaced with colored mineral granules, either 36 or 32 in. in width, composed of roofing-felt saturated and coated on both sides with asphalt and surfaced on the weather side with granulated slate or equivalent mineral material (of solid or mixed colors as may be agreed upon by the purchaser and the seller), and on the reverse side with powdered talc or mica. Manufacture, character of felt, saturant, and coatings; physical properties, surface finish, gage, saturation, packing, nails and lap-cement, sampling and testing, inspection, and basis of rejection. A. S. T. M. Emergency Alternate Provision EA-D 249b; 1944, affected section 6, Surface Finish; table I Physical Requirements of Asphalt Roofing; section 10, Packing; and section 12, Nails and Lap-Cement.

American Society for Testing Materials, D 250-44 T; 1944. Tentative Specifications for Asphalt-Saturated Asbestos Felt for Use in Waterproofing and in Constructing Built-Up Roofs. Cover quality of felt containing 85 percent asbestos, saturant, character of felt after saturation, surfacing, physical properties, stickiness, sampling, and testing.

American Society for Testing Materials, D 461-44; 1944. American Standards Assn., L 16.1-1944. Methods of Testing Wool Felt. For built-up interlocking fibers by mechanical work, moisture and heat, neither woven nor knitted. Gives requirements for standard condition, test condition, length, width, thickness, weight, breaking strength, splitting resistance, chemical analysis, microscopic examination, and special tests.

Felt Manufacturers' Assn. Classification of Rag Stock (undated). Covers requirements for rag materials suited for the manufacture of felt.

Society of Automotive Engineers. Aeronautical Material Specification No. 3280; 1942. Felt; Hair. Gives requirements for application, composition, requirements, quality, tolerances, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 3285; 1942. Felt; (Back Check), White, (100 Percent Wool). For material suitable for oil retention in installations which do not compress the felt and for other uses where unusual strength and hardness are required for consideration of wear or assembly. Gives requirements for composition, physical characteristics, quality, tests, tolerances, approval, and rejections. Similar to U. S. Gov. Army Specification 8-15; Navy Dept. Specification 27 F-7, Style F-1.

Society of Automotive Engineers. Aeronautical Material Specification No. 3286; 1942. Felt; (Firm Pad), White (100 Percent Wool). For oil and grease retention where the felt is confined and compressed in the assembly and suitable as a padding insulation and other such application where hardness is not essential.

Gives requirements for composition, physical properties, quality, tests, tolerances, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 3287; 1942. Felt; (Back Check), Gray (95 Percent Wool). For oil retention in installations which do not compress the felt, for other uses where a slightly lower than first quality is satisfactory and where unusual strength and hardness are required for consideration of wear or assembly. Gives requirements for composition, physical characteristics, quality, tests, tolerances, approval, and rejections. Similar to U. S. Gov., War Dept., Specification 8-15 and Navy Dept. Specification 27F7, Style F3.

Society of Automotive Engineers. Aeronautical Material Specification No. 3288; 1942. Felt; Upholstery (100 Percent Wool). For applications where a firm thin felt is required as padding and lining for instruments and machine parts. Gives requirements for composition, physical characteristics, quality, tests, tolerances, approval, and rejections. Similar to U. S. Gov., War Dept., Specification 8-15.

Society of Automotive Engineers. Aeronautical Material Specification No. 3290; 1942. Felt; (Firm Pad), Gray (80 Percent Wool). For sound deadening, soft pads, and for mechanical purposes where abrasion and wear are not important factors. Gives requirements for composition, physical requirements, quality, tests, tolerances, approval, and rejections. Similar to U. S. Gov., War Dept., Specification 8-15 and Navy Dept. Specification 27-F-7, Style F-13.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. Includes SAE Standard Felts. Revised 1940. General comments, 15 SAE classifications, weight and density requirements, thickness tolerances, chemical requirements, physical requirements, and recommended uses.

Underwriters' Laboratories, Inc. Standard for Class "C" Asphalt Rag-Felt Sheet Roofing and Shingles, 1941. For installation as prepared roof coverings in accordance with direction sheets for application packed with the products. Description, felt, saturant, and coating, surfacing materials, felt after saturation, finished product, dimensions, weight, lap cement, nails for sheet roofing, packing, instructions for application, apparatus and instructions of procedure for tests, and inspection of listed product.

U. S. Gov., Army Air Forces. Specification 16098 (1); 1939. Felt; Wool-Cotton-Kapok.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-14-2; 1944. Felt; Wool.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-15a; 1944. Felt; Hair.

U. S. Gov., Federal Specification C-F-201c; 1944. Felt; Hair. Covers one grade and two classes—(A) insulating (plain) and (B) packing, padding (fabric reinforced). Gives requirements for hair felt, cotton fabric, process, thicknesses and densities, form, size of rolls, organic acidity, and alkalinity and mineral acidity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DDD-P-51; 1942. Pads; Chair, Felt. Covers one type and two grades—(A) all wool and (B) wool and cotton mixture. Gives requirements for color (tan or green), material, workmanship, dimensions, felt and colors, shape, straps, and details; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-DDD-P-51; Jan. 1943, required one type and grade, and changed requirements for color, material, and details.

U. S. Gov., Marine Corps Specification, revised 1941. Felt; Gray.

U. S. Gov., Marine Corps Specification, adopted 1926. Felt; Green.

U. S. Gov., Navy Dept. Specification 27F7d; 1944. Felt; Wool.

U. S. Gov., Navy Dept. Specification 32F2d; 1944. Felt; Hair.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 8-27A; 1932. Felt; Filter, Canister.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-82; 1938. Felt; Dust Filtering.

U. S. Gov., U. S. Army, Medical Dept. Specification 8-70C; 1942. Felt; Saddle and Asbestos, for Splints.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 8-25B; 1942. Felt; Gray.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 33-6; 1933. Felt; Hair, Hard, for Blank Ammunition.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-15G; 1942. Felt; Pressed.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-79; 1933. Felt; Wool, Woven, Gray.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-144; 1944. Felt; Hair for Packing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-679; 1934. Felt; Telephone, Type MC-87, Base.

References.—Hair press cloth, *see* 365.96; rag stock for felt, *see* 390.5; felt base rugs, *see* 391; insulating felt, building, *see* 473.3.

366. CARPETS AND RUGS OF WOOL

366.0 GENERAL ITEMS

American Society for Testing Materials, D 418-42; 1942. Methods of Testing Pile Floor Covering. Gives requirements for standard condition, length, width, weight, and moisture regain, total and back thickness, net pile thickness, rows, pitch, shot, dissection, tuft length, values for velvet carpet, tests for fastness of color to light, apparatus, reference standard, and procedure.

366.1 RUGS

U. S. Gov., Federal Specification DDD-R-751; 1931. Rugs; American-Oriental (Washed). Covers one type. Gives requirements for worsted yarns, dyeing, patterns, washing, dissections, and samples; illustrations of pattern rugs; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Amendment 1; 1943, changes requirements for packing.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-33a; 1942. Carpets and Rugs; Axminster. Shall be but one type and grade. Gives requirements for material, workmanship, yarn, dyeing, dimensions, patterns, colors, dissections, finishing, edges, sampling, inspection, and tests.

U. S. Gov., Veterans Administration. Specification VA-X-106f; 1944. Yarn; Rug.

References.—Axminster, velvet, and Wilton rugs, *see* 366.2; methods of testing, *see* 365.0, 300.4; steamer rugs, *see* 369.7; felt base rugs, *see* 391.

366.2 CARPETS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Wool; Carpet. Covers definition, derivation, grades and types, uses, packing, and substitutes.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-93-2; 1944. Carpet; Aircraft.

U. S. Gov., Federal Specification DDD-C-51a; 1942. Carpets and Rugs; Axminster. Covers one type of fabric and two grades— (A) high quality and (B) extra high quality. Gives requirements for material, weaving, dyeing, patterns, dissections, tolerances, and sizing; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Amendment 1; 1943, changes requirements for filling and packing.

U. S. Gov., Federal Specification DDD-C-61b; 1937. Carpets and Rugs; Velvet, Plain and Twisted-Pile. Covers two types—(I) plain pile and (II) twisted pile. Gives requirements for yarn, dyeing, dissections, tolerances, weight, and carpet samples; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-C-71a; 1934. Carpets and Rugs; Wilton. Covers four types—(I) worsted Wilton rugs, 6 frames; (II) worsted Wilton carpets, 5 frames; (III) wool Wilton carpets, 2 or 3 frames; and (IV) wool Wilton rugs and carpets (Saxony type). Gives requirements for worsted yarns, wool yarn, dyeing, patterns, dissections, tolerances, small samples, and rug samples; definition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Amendment 1; 1943, changes requirements for stuffers and for packing.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 8-59A; 1931. Carpet for Gun Sponges.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-33a; 1942. Carpets and Rugs; Axminster. Shall be but one type and grade. Gives requirements for material, workmanship, yarn, dyeing, dimensions, patterns, colors, dissections, finishing, edges, sampling, inspection, and tests.

U. S. Gov., Veterans Administration. Specification VA-X-96g; 1944. Warp; Carpet.

References.—Methods of testing, *see* 365.0, 300.4.

367. WOOL KNIT GOODS

367.0 GENERAL ITEMS

American Society for Testing Materials, D 231-39; 1939. Methods of Testing and Tolerances for Knit Goods. For those classes of knit goods which later enter into manufacturing processes; tolerances for width, weight, count, and bursting strength; test specimen, standard conditions, apparatus, and test procedures; moisture regain, grease determination, and percentage of cotton and wool. A.S.T.M. Emergency Alternate Provision, EA-D 231; 1944, affected section 13, Grease Determination.

Textile Color Card Assn. of the U. S., Inc. Glove Colors, 1944. The 1945 spring season card colors for women's gloves include 17 colors.

367.1 SOCKS AND STOCKINGS, WOOLEN

U. S. Gov., Army Air Forces. Specification No. 3192; 1943. Sock; Light Weight Woolen (for Arctic Sock Assembly).

U. S. Gov., Army Air Forces. Specification No. 3193; 1943. Sock; Medium Weight Woolen (for Arctic Sock Assembly).

U. S. Gov., Army Air Forces. Specification No. 3195; 1943. Sock; Net Worsted Jumbo (for Arctic Sock Assembly).

U. S. Gov., Army Air Forces. Specification 3196 (1); 1944. Sock; Knit Felt Duffel (for Arctic Sock Assembly).

U. S. Gov., Federal Specification JJ-S-581a; 1938. Amendment 1; 1944. Socks; Wool and Wool-Cotton Mixture. Covers one grade and three classes—(A) light weight—type 1, silver-gray blend and type 2, black, or in colors; (B) medium weight—silver-gray blend; and (C) heavy weight—silver-gray blend. Gives requirements for material, workmanship, knitting, methods of measuring, dimensions, color, elasticity, shrinkage, finish, pairing, length of ends, and detail for each class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-S-48; 1944. Socks; Wool, Cushion Sole, O.D.

U. S. Gov., Marine Corps Specification, adopted 1937. Socks; Sweat.

U. S. Gov., Marine Corps Specification, adopted 1937. Stockings; Athletic.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-34A; 1927. Socks; Arctic (Alaskan Clothing).

References.—Standard sizes, methods of measuring, colors, *see* 309.2; tolerances, methods of testing, *see* 367.0, 365.0, 300.4.

367.2 KNIT WOOLEN UNDERWEAR

Underwear Institute. Specifications B-3, B-11, C-3, M-3, M-13, M-17, M-18, and W-2; 1935. Standard Measurements for Woolen Underwear. Gives detailed requirements for measuring boys', children's, men's, and women's worsted, worsted-merino, wool, and wool-cotton union suits; boys' wool and cotton-wool shirts and drawers; men's wool and wool-cotton shirts; and men's worsted, worsted-merino, wool, and wool-cotton drawers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS33-43; 1943. Knit Underwear (Exclusive of Rayon). Covers standard methods of measuring and standard measurements for knit underwear (exclusive of rayon) for boys, children, infants, men, and women. Gives requirements for cotton—ribbed, flat knit, panel ribbed, swiss ribbed, fleece-lined; wool—worsted, worsted-merino, wool-cotton; various sizes, weights and types of underwear; and includes sport coats, athletic shirts, polo shirts, sweat shirts, and women's sleeping pajamas; recommended underwear box sizes and recommended cone colors for single cotton yarns. Sponsored by Underwear Institute.

U. S. Gov., Federal Specification JJ-D-653; 1936. Amendment 1; 1944. Drawers; Men's, Cotton-Wool, Mixed. Covers one grade—"firsts"; two types—(I) flat knit and (II) ribbed knit; two classes—(A) heavy weight and (B) medium weight; and 15 subtypes. Gives requirements for fabric, thread, sateen, buttons, tape, workmanship, design, sizes and methods of measuring, stitches, seams, stitching, weight per dozen, and shrinkage; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification JJ-U-517; 1936. Amendment 1; 1944. Undershirts; Men's, Cotton-Wool, Mixed. Covers one grade—"firsts"; two types—(I) flat knit and (II) ribbed knit; two classes—(A) heavy weight and (B) medium weight; and 15 subtypes. Gives requirements for fabric, thread, workmanship, design and construction, sizes and methods of measuring, stitches, seams, stitching, weight per dozen, and shrinkage; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Federal Specification JJ-U-531; 1932. Amendment 1; 1935. Underwear; Knit, Standard Sizes (Exclusive of Rayon). Provides standard methods of measurement and standard measurements for knit underwear for the guidance of producers, distributors, and users, in order to eliminate confusion resulting from the diversity of measurements and methods and to provide a uniform basis for guaranteeing full sizes.

U. S. Gov., Federal Specification JJ-U-561; 1933. Union Suits; Men's (Cotton-Wool, Ribbed-Knit, Medium-Weight). Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-139; 1943. Undershirts; Wool, (25 Percent and 50 Percent).

References.—Methods of measuring and standard measurements, *see* 309.4; tolerances and methods of testing, *see* 367.0, 365.0, 300.4.

367.3 HOODS AND TOQUES

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-48-A; 1942. Toque; Wool, Knit, M-1941.

367.4 JERSEYS AND SWEATERS

U. S. Gov., Federal Specification JJ-S-846; 1937. Sweaters; Wool, Knitted. Covers two types—(I) coat-style—boys' and youths', children's, ladies', men's, and misses'; and (II) slipover style—boys' and youths', children's, and misses'. Gives requirements for material, workmanship, stitches, seams and stitching, method of measuring, sizes, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, adopted 1926. Jersey.

U. S. Gov., Marine Corps Specification, adopted 1933. Jersey; Football.

U. S. Gov., Navy Dept. Specification 55J2h; 1940. Jerseys.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-97; 1933. Sweaters; Worsted, Olive-Drab.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-121B; 1944. Sweaters; Women's.

367.5 MUFFLERS AND SCARFS

U. S. Gov., Army Air Forces. Specification 3239; 1944. Scarf; Flying, Heavy, Type N-1.

U. S. Gov., Marine Corps Specification, adopted 1944. Muffler; Red (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Scarf; Field, Khaki (Marine Corps Women's Reserve).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-99B; 1942. Mufflers; Wool.

367.6 BATHING TRUNKS, KNIT WOOL

U. S. Gov., Navy Dept. Specification 37S8b; 1939. Suits; Bathing.

U. S. Gov., Navy Dept. Specification 37T2c; 1944. Trunks; Bathing, Woolen.

367.7 WOOLEN GLOVES

U. S. Gov., Marine Corps Specification, adopted 1938. Gloves; Woolen, Green.

U. S. Gov., Marine Corps Specification, adopted 1944. Gloves; Wool, Olive Green, Leather Palm.

U. S. Gov., Navy Dept. Specification 73G2b; 1945. Gloves; Woolen.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3190A; 1944. Insert; Knit Woolen (for Type D-3A Glove).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-60A; 1937. Gloves; Woolen, Olive-Drab.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-120; 1941. Gloves; Wool, Blue, Nurses'.

U. S. Gov., Veterans Administration. Specification VA-X-149c; 1942. Gloves; Woolen.

References.—Rubber gloves, *see* 203.2, 204.52.

367.9 MISCELLANEOUS KNIT CLOTHING

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-123; 1942. Cuffs and Anklets; Wool, Knitted, O. D.

368. WOOL WEARING APPAREL (EXCEPT KNIT APPAREL)

368.0 GENERAL ITEMS

American Home Economics Assn., sponsor, 1941. American Standards Assn., L11.1-1941. Body Sizes for Boys' Garments. For accurate determination of size a combination of two measurements are necessary, a length and girth or weight. Gives table showing height, hip girth, chest girth, and waist girth for size groups and average age for size groups. Age cannot be used since body size for a given age varies greatly. The two measurements most practical are height and girth of hip. Based on measurements made by Bureau of Home Economics, U. S. Dept. of Agriculture (Misc. Pub. 365) in a WPA project.

368.1 WOOLEN BREECHES

U. S. Gov., Army Air Forces. Specification No. 3177 (3); 1944. Trousers; Intermediate Flying, Type A-9.

U. S. Gov., Army Air Forces. Specification No. 3182; 1943. Insert; Electrically-Heated Trouser (for Type F-2 Electrically-Heated Flying Suit).

U. S. Gov., Army Air Forces. Specification 3219A-1; 1944. Trousers; Flying, Intermediate, Type A-11A.

U. S. Gov., Army Air Forces. Specification No. 3223; 1944. Trousers; Intermediate Flying, Nurses, Type A-13.

U. S. Gov., Marine Corps Specification, adopted 1944 Slacks; Covert (Marine Corps Women's Reserve).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-29A; 1937. Breeches; Woolen, Service, Officers'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-30C; 1937. Breeches; Woolen, Elastique.

References.—Breeches for uniforms, *see* 368.82.

368.2 COATS AND OVERCOATS

U. S. Gov., Marine Corps Specification, adopted 1944. Blouse; Dress, Summer, A, Officers' (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1943. Coat; Service, Winter, Officer and Enlisted Personnel (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Coat; Service, Winter.

U. S. Gov., Marine Corps Specification, adopted 1944. Coat; Sheepskin or Alpaca Lined.

U. S. Gov., Marine Corps Specification, revised 1944. Overcoat; Enlisted Men.

U. S. Gov., Marine Corps Specification, adopted 1943. Overcoat; Officers' (Marine Corps Women's Reserve).

U. S. Gov., Navy Dept. Specification 55-O-1c; 1944. Overcoats.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-11; 1921. Coat; Serge, O.D., Norfolk, Nurses'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-28B; 1940. Coats; Service, Officers'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-31E; 1943. Coats; Wool, Serge, O. D., 18 oz. (Stock Nos. 55-C-69350 thru 55-C-69462.)

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-51B; 1940. Overcoats; Wool, Roll Collar.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-81; 1930. Cape; Olive-Drab, Nurses'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-93; 1930. Overcoat; Officers', Olive-Drab, Roll Collar.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-127; 1941. Coats; Wool, Covert, Blue, Nurses'.

References.—Coats for uniforms, *see* 368.82; raincoats, oilskin coats, *see* 392.54, 392.53; cotton coats, *see* 311.1; methods of testing, *see* 365.0, 300.4; wool grades, *see* 360.

368.3 BATH ROBES

American Hospital Assn., 67-154. Bath Robes. Covers two types, one grade, and three sizes. Based on U. S. Gov. Federal Specifications DDD-R-591 for Bath Robes; CCC-T-191a for General Specifications, Test Methods, Textiles; DDD-S-751 for Stitches, Seams, and Stitching; and V-T-276b for Cotton Thread.

U. S. Gov., Federal Specification DDD-R-591; 1936. Amendment 1; 1938. Robes; Bath. Covers small, medium, and large sizes, and two types—(I) flannelet and (II) terry cloth. Gives requirements for material, thread count, tensile strength, description, collar, sleeves, pocket, belt, hems, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

368.4 WOOLEN SKIRTS

U. S. Gov., Marine Corps Specification, adopted 1943. Skirt; Service, Winter, Officer and Enlisted Personnel (Marine Corps Women's Reserve).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-12; 1921. Skirts; Serge, O. D., Nurses'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-124; 1941. Skirts; Wool, Covert, Blue, Nurses'.

References.—Dress patterns, *see* 311.2.

368.5 WOOLEN SHIRTS

U. S. Gov., Marine Corps Specification, revised 1942. Shirt; Flannel, Khaki.

U. S. Gov., Navy Dept. Specification 55S19b; 1944. Shirts; Flannel, Blue.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-26C; 1933. Shirt; Flannel, Olive-Drab, Coat Style.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-52; 1926. Shirt; Wool, O. D., Officers'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-108; 1937. Shirt; Worsted, Olive-Drab.

References.—Standard measurements and methods of measuring, *see* 311.5; undershirts, *see* 367.2.

368.6 WOOLEN AND FELT SLIPPERS

368.7 WOOLEN DRAWERS AND UNDERSHIRTS

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-138; 1943. Drawers; Wool, (25% and 50%).

References.—Knit wool underwear, *see* 367.2.

368.8 SUITS AND UNIFORMS OF WOOL

368.81 Woolen Suits

U. S. Gov., Army Air Forces. Specification 3237-1; 1944. Suit; Flying, Light, Gabardine, Type L-1.

368.82 Woolen Uniforms

U. S. Gov., Marine Corps Specification, adopted 1943. Trousers; Service, Winter.

U. S. Gov., Navy Dept. Specification 55 T 12c; 1943. Trousers; Blue, Cloth.

U. S. Gov., Navy Dept. Specification 55U5; 1942. Uniforms; Aviation Cadets', and/or Naval Reserve Officers' Training Corps.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-83B; 1937. Trousers; Enlisted Men's, Service, Olive-Drab.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-89. 1930. Coat; Dress, for Enlisted Men.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-90; 1930. Trousers; Dress, for Enlisted Men.

References.—Wool grades, *see* 300.1; methods of testing, *see* 365.0, 300.4; cotton uniforms, *see* 311.6.

368.9 MISCELLANEOUS WOOL WEARING APPAREL

U. S. Gov., Army Air Forces. Specification 3171 (2); 1943. Jacket; Mechanic's Arctic, Type D-2.

U. S. Gov., Army Air Forces. Specification 3214-1; 1944. Jacket; Officers' Flight, Type B-13.

U. S. Gov., Army Air Forces. Specification 3216-1; 1944. Jacket; Enlisted Mens' Flight, Type B-14.

U. S. Gov., Army Air Forces. Specification 3220A-2; 1945. Jacket; Flying, Intermediate, Type B-15A.

U. S. Gov., Army Air Forces. Specification No. 3225; 1944. Jacket; Intermediate Flying, Nurses, Type B-17.

U. S. Gov., Army Air Forces. Specification No. 3246; 1945. Slacks; Nurses Flying, Light, Type L-1.

U. S. Gov., Army Air Forces. Specification No. 3247; 1945. Jacket; Nurses Flying, Light, Type L-1.

U. S. Gov., Navy Dept. Specification 37C5; 1934. Clothing; Submarine, Woolen.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-119; 1941. Neckties; Black, Wool, M-1940.

References.—Caps and hats, *see* 395.

369. MISCELLANEOUS MANUFACTURES OF WOOL AND HAIR

369.1 BRAIDS AND CORDS

U. S. Gov., Marine Corps Specification, adopted 1923. Braid; Mohair, Black, 1/2-In. (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1923. Braid; Scarlet, Worsted, Tubular.

U. S. Gov., Navy Dept. Specification 71B2a; 1941. Braid; Branch-Mark.

U. S. Gov., Navy Dept. Specification 71B5b; 1944. Braid; Mohair, Black.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 7-11A; 1942. Braid; Mohair Flat.

References.—Service stripes, *see* 369.6.

369.2 BLANKETS

369.20 General Items

American Institute of Laundering. Service Bulletin 10. How to Launder Blankets and Comforters. This bulletin furnishes a thorough discussion on the laundering of blankets, including—washing temperatures, sudsing and rinsing time, size of loads, fading and loss of color, spots and stains, soil, laundering of cotton and wool blankets, extraction and drying, binding, mothproofing, and the handling of quilts and comforters.

369.21 Bed Blankets

American Hospital Assn., 67-13. Wool Blankets. Covers four types. Based on U. S. Gov., Navy Dept., Specification 27 B 7c for Wool Blankets; U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Test Methods, Textiles; and P-S-611 for Salt-Water Soap.

American Society for Testing Materials, D 576-40T; 1940. Tentative Specifications for All Wool, All Cotton, and Wool and Cotton Blanketing (Household). Includes eight types of fabrics with requirements for warp and filling, weight, minimum thickness, breaking strength, air permeability, and methods of testing.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-44-S. Blanket; Wool.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R11-36; 1936. Bed Blanket Sizes. This recommendation establishes a simplified list and 11 sizes of bed blankets (cotton, wool, and cotton and wool mixed). Initiated by the National Assn. of Wool Manufacturers.

U. S. Gov., Marine Corps Specification, revised 1939. Blanket; Wool, Green.

U. S. Gov., Navy Dept. Specification 27B7e; 1945. Blankets; Wool.

U. S. Gov., Navy Dept. Specification 27B10; 1941. Blankets; Wool, Field, Green.

U. S. Gov., Treasury Dept., Procurement Div., 398A; 1942. Blankets, 50 Percent Wool (Double Size). Shall be one type and grade 60 in. by 80 (160 in. over-all length). Gives requirement for wool and cotton content, minimum weight, thread count, breaking strength, and shrinkage; weave, color and patterns, edges, and napping; method of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-111A; 1940. Blanket; Wool, Olive-Drab, M-1934.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-10; 1940, Amended 1943. Blankets; Cotton Warp, Wool Filling. Shall be type I—mothproofed, type II—not mothproofed; and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, color and appearance, weave, thread count, breaking strength, weight, size, fiber content, shrinkage, binding, mothproofing, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-12; 1940. Blankets; Cotton Warp, Cotton and Wool Filling. Shall be but one type and the grade shall be that commercially known as "firsts." Gives requirements for material, workmanship, fiber content, color, color fastness, appearance, thread count, strength, weight, size, shrinkage, binding, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-19; 1941. Blankets; 80% Wool (Crew). Shall be type I—mothproofed, type II—not mothproofed; and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, fiber content, color, color fastness, appearance, weave, thread count, strength, weight, size, shrinkage, binding, mothproofing, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-30; 1941. Blankets; All Wool. Shall be type I—mothproofed, type II—not mothproofed; and the grade shall be that known commercially as "firsts." Gives requirements for material, workmanship, color and appearance, color fastness, weave, shrinkage, size, thread count, strength, weight, binding, mothproofing, sampling, inspection, and tests.

References.—Cotton and part wool, *see* 315.5.

369.22 Horse Blankets

U. S. Gov., Marine Corps Specification, adopted 1918. Blanket; Saddle.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-106; 1936. Blanket; Saddle, O. D., 73 by 85 In.

369.23 Printer's Blankets

369.29 Miscellaneous Specifications for Wool Blankets

National Assn. of Wool Manufacturers. Bulletin of the Wool Manufacturers for 1943. Reprints complete specifications for woolen products as follows: U. S. Army Specifications, U. S. Navy Specifications, U. S. Marine Corps Specifications, and Federal Specifications.

Reference.—Insulating blanket, *see* 473.3.

369.3 MATTRESSES, HAIR

U. S. Gov., Navy Dept. Specification 27M8b; 1940. Mattresses; Hair, Berth and Hammock, 26 by 72 1/2 In.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-45b; 1944. Mattresses; Curled Hair, Hog. There shall be but one type and grade. Gives requirements for ticking, thread, tufting tape or twine, hair, workmanship, size, weight, construction, hog hair, tags, and identification and marking; sampling, inspection, and method of test; and packaging, packing, and marking for shipment.

References.—Curled horsehair, *see* 362.1.

369.4 HAIR PILLOWS

369.5 FLAGS AND FLAG KITS

References.—Wool bunting, flags, *see* 306.42, 306.43.

369.6 CHEVRONS AND SERVICE STRIPES

U. S. Gov., Marine Corps Specification, revised 1943. Chevrons; Dress.

U. S. Gov., Marine Corps Specification, adopted 1943. Chevrons; Service, Summer (Woven).

U. S. Gov., Marine Corps Specification, revised 1943. Chevrons; Service, Winter.

U. S. Gov., Navy Dept. Specification 71D1; 1931. Devices, Breast, Collar, and Sleeve; Marks, Shoulder, U. S. Navy and U. S. Coast Guard.

369.7 STEAMER RUGS

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-24; 1941. Rugs; Steamer. Shall be three types covering khaki and blue plaid, and the grade shall be that known commercially as "firsts," unless otherwise noted. Gives requirements for materials, workmanship, weave, shrinkage, color fastness, color, pattern, appearance, fringe, quality of wool, physical properties, sampling, inspection, and tests.

369.9 MANUFACTURES OF HAIR AND WOOL NOT ELSEWHERE CLASSIFIED

U. S. Gov., Navy Dept. Specification 71E1a; 1933. Epaulets and Devices.

U. S. Gov., Treasury Dept., Procurement Div., No. 532; 1942. Yarn; Hand Knitting (Worsted). Covers one type, one grade, and three classes—(A) sweater, (B) sock, and (C) shawl. Gives requirements for material, workmanship, fiber diameter distribution, fluffiness and elasticity, spinning, count, ply, oil content, twist, reeling, skeins, normal moisture regain, dying, and color fastness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 8-36A; 1935. Cloth; Fuze.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 78-5A; 1942. Pad; Marking-Machine, Laundry.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-49; 1939. Girth; Saddle, Mohair Cord.

References.—Hair belting, *see* 314.1; wool rags, *see* 390.5; hair floor sweeps, *see* 981.4; brushes of bristle and hair, *see* 982.

370-379 SILK AND MANUFACTURES THEREOF

370. GENERAL ITEMS

American Institute of Laundering. Service Bulletin 15. How To Launder Silk and Rayon. This bulletin explains identification and washing of rayon, silk, and silk-rayon mixtures, laundering methods for white cotton-rayon and white cotton-silk mixtures, laundering of colored rayon and silk, bleaching of yellowed silk, finishing silks and rayons, common difficulties in laundering silk and rayon pieces.

American Society for Testing Materials, D 276-43T; 1943. Tentative Methods for Identification of Fibers in Textiles. Covers procedures for the identification of textile fibers used commercially in woven, knit, or braided fabrics. Gives reference samples, reagents, apparatus, considerations for sampling, test specimens, mounting specimens, preliminary examination, procedures for various types of fibers, and enlarged photographs of various fibers.

American Society for Testing Materials, D 416-39; 1939. Method of Test for Maximum Residual Shrinkage of Silk and Rayon Woven Fabrics. For use in commercial laundering and for general technical purposes. Requirements for test sample, washing machine, soap solution, washing and pressing, conditioning, and comparison.

American Society for Testing Materials, D 434-42; 1942. Method of Test for Resistance to Yarn Slippage in Silk, Rayon, and Silk-Rayon Woven Fabrics. Covers slippage of filling yarns on warp yarns, or warp yarns on filling yarns, in excess of normal stretch of the fabric under the same load; preparation of specimen, testing machine, standard condition, and test procedure.

American Society for Testing Materials, D 436-37; 1937. Method of Test for Colorfastness of Dyed or Printed Wool, Silk, or Rayon Fabrics to Laundering or Domestic Washing. For washing tests of colored fabrics without use of bleaching agent. Gives apparatus, test specimens, soap solution, procedure, classification, and results.

National Assn. of Dyers and Cleaners of the U. S. and Canada. Identification of Fibers, T-145; 1944. For training employees in the identification of textile fibers. Covers natural fibers and synthetic fibers. Gives method of testing and tests for fiber content of pure silk, weighted silk, wool, cotton, regenerated rayon, cellulose acetate rayon, nylon, vinyon, aralac casein, and glass.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Silk; Silk Yarns and Silk Fabrics. Covers definition, constants, occurrence, containers, shipping regulations, ordering instructions, general classes, thread sizes, qualities, and trading.

Textile Color Card Assn. of the U. S., Inc. Standard Ninth Edition Color Card, 1944. A new master color card for all industries and trades. This is not a card presenting fashion colors for but one season only, but it embraces a complete collection of important staple shades having continued popular acceptance. A Research Associate has been established at the National Bureau of Standards to include the calibration of the 216 colors contained in the Ninth Edition of the Standard Color Card of America and the translation of these standards into the language of scientific equivalents and nomenclature.

371. SILK UNMANUFACTURED

372. SILK SKEINS, COPS, OR WARPS

372.0 GENERAL ITEMS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Silk Yarns. Covers definition, containers, shipping regulations, qualities, and ordering instructions.

372.1 BRAIDING SILK

References.—Thrown silk rules, *see* 372.0; tests for silk fiber and weighting of silk, *see* 370; standard colors, *see* 370; raw silk classification, *see* 371; textile testing methods, *see* 300.4.

372.2 EMBROIDERY SILK

U. S. Gov., Federal Specification V-T-301; 1931. Thread; Silk. Covers four types—machine twist, button hole twist (tailors and dry goods), sewing silk (pound goods and dry goods), sewing silk (pound goods and small goods), and embroidery silk. Gives requirements for material and workmanship; cords, twists, commercial designation (00, 0, A, B, C, D, E, F, and FF), length per ounce, and strength for machine twist (black, white, and colored); cords, twist, commercial designation (6, 8, 10, 12, and 14), length per ounce, and strength for tailors' button hole twist (white, black, and colored); size, and length per ounce of dry goods button hole twist; plies; twist, commercial designation (0, A, B, and C), length per ounce, and strength of sewing silk pound goods (white, black, and colored); size plies, twist, and length per ounce of sewing silk (small goods) (white, black, or in colors); plies, twist, commercial designation (D, E, and EE), length per ounce, and strength of embroidery silk (white, black, and colored); elongation; and color fastness; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 27S2d; 1932. Silk; Embroidery.

References.—*See* references under 372.1.

372.3 SEWING SILK

U. S. Gov., Federal Specification V-T-301; 1931. Thread; Silk. Covers four types—machine twist, buttonhole twist (tailors and dry goods), sewing silk (pound goods and small goods), and embroidery silk. Gives requirements for material and workmanship; cords, twist, commercial designation (00, 0, A, B, C, D, E, F, and FF), length per ounce, and strength for machine twist (black, white, and colored); cords, twist, commercial designation (6, 8, 10, 12, and 14), length per ounce, and strength for tailors' button hole twist (white, black, and colored); size, and length per ounce of dry-goods buttonhole twist; plies, twist, commercial designation (0, A, B, and C), length per ounce, and strength of sewing silk pound goods (white, black, and colored); size plies, twist, and length per ounce of sewing silk (small goods) (white, black, or in colors); plies, twist, commercial designation (D, E, and EE), length per ounce, and strength of embroidery silk (white, black, and colored); elongation; and color fastness; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 7-7A; 1938. Thread; Silk, Sewing (for Powder Bags).

U. S. Gov., Veterans Administration. Specification VA-X-89d; 1943. Thread; Silk (Sewing Silk).

References.—*See* references under 372.1.

372.4 SPUN SILK

References.—*See* references under 372.1.

372.5 TWIST

U. S. Gov., Federal Specification V-T-301; 1931. Thread; Silk. Covers four types—machine twist, button hole twist (tailors and dry goods), sewing silk (pound goods and dry goods), sewing silk (pound goods and small goods), and embroidery silk. Gives requirements for material and workmanship; cords, twists, commercial designation (00, 0, A, B, C, D, E, F, and FF), length per ounce, and strength for machine twist (black, white, and colored); cords, twist, commercial designation (6, 8, 10, 12, and 14), length per ounce, and strength for tailors' button hole twist (white, black, and colored); size, and length per ounce of dry goods button hole twist; plies, twist, commercial designation (0, A, B, and C), length per ounce, and strength of sewing silk pound goods (white, black, and colored); size plies, twist, and length per ounce of sewing silk (small goods) (white, black, or in colors); plies, twist, commercial designation (D, E, and EE), length per ounce, and strength of embroidery silk (white, black, and colored); elongation; and color fastness; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—*See* references under 372.1.

372.6 SURGEONS' SILK

References.—*See* references under 372.1.

372.7 INSULATING SILK

References.—*See* references under 372.1.

372.8 SILK THREAD FOR AIRCRAFT FABRIC

References.—*See* references under 372.1.

373. FABRICS WHOLLY OR CHIEFLY SILK

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS65-43; 1943. Methods of Analysis and of Reporting Fiber Composition of Textile Products. This standard provides methods of analyzing finished products composed of cotton, rayon, silk, or woolen fiber, and mixtures of two or more of such fibers, and determining the percentage by weight of each kind of fiber present, and the percentage by weight of total sizing, finishing, and other non-fibrous materials; provides methods of reporting on same; includes definitions of these fibers; and illustrates the manner by which testing laboratories may certify that the analyses have been conducted in accordance with the methods of the standard.

373.0 GENERAL ITEMS

American Institute of Laundering. Service Bulletin 6. How To Launder Curtains. This bulletin tells you how to identify and inspect curtains, how to wash and finish curtains, how to tint curtains, and how light attacks curtain fabrics.

373.1 RIBBONS

U. S. Gov., Marine Corps Specification, adopted 1922. Ribbon; Silk, Yellow (for Banner, Trumpet).

U. S. Gov., Navy Dept. Specification 55Rib; 1936. Ribbons; Cap.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 7-3B; 1932. Ribbons for Decoration and Service Medals.

373.2 SILK CLOTH

American Hospital Assn., 13-25. Oiled Silk. Covers one type, one grade, and two classes—(A) silk and (B) rayon. Based on U. S. Army Specifications 7-17B for Oiled Silk and U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Test Methods, Textiles.

373.20 General Items

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Silk Fabrics. Covers definition, physical characteristics, type, containers, shipping, ordering instructions, marketing, and substitutes.

373.21 Balloon and Parachute Silk

U. S. Gov., Army-Navy Aeronautical Specification AN-CCC-S-371-2; 1944. Silk; Parachute.

U. S. Gov., Navy Dept. Specification 27S9e; 1937. Silk; Parachute.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-51C; 1941. Silk; Parachute, Pyro-Technic.

373.22 Banner Silk

U. S. Gov., Marine Corps Specification, adopted 1922. Colors; National, Silk.

U. S. Gov., Marine Corps Specification, adopted 1917. Marine Corps Colors.

U. S. Gov., Marine Corps Specification, adopted 1935. Silk; Banner.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 7-2A; 1932. Silk; Banner.

373.23 Bolting Silk

373.24 Cartridge Bag Silk

U. S. Gov., Navy Dept. Specification 27C4b; 1942. Cloth; Cartridge-Bag, Silk.

373.25 Silk and Satin Lining

U. S. Gov., Marine Corps Specification, adopted 1926. Lining; Satin, Green (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1926. Lining; Silk, Scarlet, for Jacket, Dress, Evening (for Officers).

373.26 Silk Velvet

U. S. Gov., Marine Corps Specification, revised 1931. Velvet; Silk, Black (for Officers).

U. S. Gov., Navy Dept. Specification 55V2; 1927. Velvet; Black.

373.27 White Silk for Stencils

373.28 Silk Cloth for Bags

373.29 Miscellaneous Silk Cloth

References.—Tolerances, methods of testing, colors, *see* 373.20, 370., 300.4.

374. SILK BANDING, BINDING, WEBBING, ETC.

374.1 SILK BRAID

U. S. Gov., Marine Corps Specification, adopted 1938. Braid; Silk, Yellow.

References.—Braid for uniforms, *see* 369.6.

374.2 SILK TAPE

American Society for Testing Materials, D 259-44; 1944. Methods of Testing and Tolerances for Woven Tapes. Apply to silk and cotton tapes, permissible tolerances in weight, width, thickness, and construction, with requirements for sampling, breaking strength, sizing content, acidity test, quinhydrone pH indicator apparatus, and procedures.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-74; 1944. Tape; Silk.

U. S. Gov., Federal Specification DDD-T-126; 1937. Tape (Taste); Silk. Covers two types—(I) 1/4 in., high grade, and (II) 1/4 in., medium grade. Gives requirements for construction and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 7-18; 1936. Tape; Silk, Reinforcing.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-121; 1943. Tape; Silk (for Use in the Loading of Ammunition).

References.—Silk electrical tape, *see* 719.56.

374.3 RUBBERIZED SILK TAPE

375. WEARING APPAREL OF SILK

375.0 GENERAL ITEMS

American Institute of Laundering. Service Bulletin 23. How To Launder Hoisery. This bulletin explains how hosiery should be classified, turning rayon and silk hosiery before washing, using as short a washing formula as possible, what is meant by "dull-luster" hosiery and "run-proof" hosiery, finishing precautions for garterless hose, and common hosiery laundering problems.

375.1 CRAVATS

U. S. Gov., Navy Dept. Specification 73 N 1d; 1944. Neckties; Stewards'.

U. S. Gov., Navy Dept. Specification 73 N 2D: 1944. Neckties; Four-In-Hand, Black.

375.2 SILK HOSIERY

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M149; 1935. A Basis for a Performance Specification for Women's Full-Fashioned Silk Hosiery. Covers results of a survey on women's full-fashioned silk hosiery purchased from various retail stores in several large cities in different parts of the U. S. Gives description of the samples used, test procedure, and test results.

References.—Standard sizes, methods of measuring, standard colors, *see* 309.2.

375.3 SILK WAISTS

References.—Dress patterns, *see* 311.2.

375.4 SILK CLOTHING FOR AVIATORS

376. HANDKERCHIEFS AND WOVEN MUFFLERS OF SILK

378. LACES, VEILS, NETS, AND EMBROIDERIES OF SILK

References.—Gold and silver lace, *see* 399.9.

379. MISCELLANEOUS MANUFACTURES OF SILK

379.1 CORDS, SILK

Tag Manufacturers Institute. Manual of Standard Specifications. Standard Specifications for Strings, 1939. Gives TMI designation, usual dealers name, technical description according to manufacturers standards, approximate yards per pound, and strength of cotton and silk cords and twines and jute twines.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-126; 1944. Cord; Silk.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 7-12E; 1941. Cordage; Silk.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-55B; 1941. Twine; Silk Lacing, for Assembly of Propelling Charges.

379.2 FLAGS

References.—Railway signal flags, *see* 306.43.

379.3 FRINGE

U. S. Gov., Marine Corps Specification, adopted 1922. Fringe; Silk, Yellow (for Banner, Trumpet).

379.4 GRADING SCREENS OF SILK CLOTH

References.—Methods of testing, *see* 370, 300.4.

379.9 SILK NOT ELSEWHERE CLASSIFIED

Illuminating Engineering Society. Specifications for Shades for I.E.S. Portable Lamps, 1935. Applies to shades designed for incorporation in certified I.E.S. table and floor lamps. Includes requirements for effectiveness, construction, and proposed specifications for shades for I.E.S. portable lamps.

390-399 MISCELLANEOUS TEXTILE PRODUCTS

390. GENERAL ITEMS

390.4 SPECIFICATIONS AND TOLERANCES FOR RETAIL FABRIC MEASURING DEVICES

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Fabric-Measuring Devices. These devices refer to machines which are adapted to measure and to indicate automatically the length of fabric passed through it, for use in connection with retail sales. Specification requirements are given covering basis and character of graduations, pointers and indicators, readability of indications, and tolerances.

390.5 CLASSIFICATION OF RAG AND TWINE WASTE STOCK

Felt Manufacturers' Assn. Classification of Rag Stock. Covers requirements for rag materials suited for the manufacture of felt.

Felt Manufacturers Assn. Classification of Rag Stock, 1937. Definitions of seven classes of rag stock including roofing felt stock, jute bagging, carpets, etc. Also gives permissible exceptions for manufacture of felt paper, trade customs, and list of unsuitable materials. Approved by the National Assn. of Waste Materials, Inc.

National Assn. of Waste Material Dealers, Inc. Classification Covering Bagging, 1938. Definitions for all classes of gunny, burlap, and jute bagging. Approved by the Writing Paper Manufacturers' Assn.

National Assn. of Waste Material Dealers, Inc. Classification for Mixed Twines, 1938. Definition for dry baled mixed hemp and jute twines, containing not more than 10 percent straight sisal, and free from tannery sisal, hide ropes, and string. Approved by the Writing Paper Manufacturers' Assn.

National Assn. of Waste Material Dealers, Inc. Cotton Rag Classifications, 1938. Defines 15 grades of old rags and 39 grades of new rags, by color and type of material; requirements as to cleanliness and freedom from foreign matter. Approved by the Writing Paper Manufacturers' Assn.

National Assn. of Waste Material Dealers, Inc. Specifications for Hosiery, 1938. Covers knitted rags such as are accumulated from hosiery and underwear factories in 18 defined grades by color, kind of material, cleanliness, amount of trimmings, and freedom from foreign matter. Approved by the Writing Paper Manufacturers' Assn.

National Assn. of Waste Material Dealers, Inc. Specifications for Purchase of Rags for Conversion Into Wiping Cloths, 1938. Definitions for 11 classes of material, and requirements for minimum size. Conforms to standards of the Sanitary Institute of America.

National Assn. of Waste Material Dealers, Inc. Classification for Woolen Rags, 1938. For mixed soft woolens, mixed rough cloth, mixed skirted cloth, and merchant tailor clips; definition of each class, and standards for packing and delivery. Approved by the Writing Paper Manufacturers' Assn.

390.6 SIZINGS FOR FABRICS

391. LINOLEUM FLOOR COVERING

American Hospital Assn., 25-1. Battleship Linoleum. Covers one type, one grade, and three thicknesses—1/8", 3/16", and 6 mm. Based on U. S. Gov. Federal Specification LLL-L-351a for Battleship Linoleum.

American Hospital Assn., 25-4. Plain. Inlaid, and Printed Linoleum. Covers plain, jaspe, granite, straight-line, and molded inlaid, and printed. Based on U. S. Gov. Federal Specification LLL-L-361.

U. S. Gov., Army Air Forces. Specification 26560; 1939. Cement; Linoleum.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS14; 1939. Indentation and Recovery of Low-Cost Floor Coverings. Indentation and recovery determinations for loads ranging from 25 lb. to 200 lb. on a flat-ended pin 1/4 in. in diameter were made on 23 floor coverings at a relative humidity of 65 percent and temperature of 72° F. Indentation readings were taken for each load at intervals of time up to 30 min. and then recovery readings at intervals of time up to 120 min. Various types of floor coverings were tested, such as asphalt tile, pressed fiber board, linoleums, felt base floor coverings having various wearing surfaces, rubber, and wood. A description of the apparatus and the procedure used are given. The results are presented in graphic form to show the relative merits of the various floor coverings with respect to initial and 30-min. indentation under various loads and the recovery after removal of the load.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS34; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 1. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on 40 different test installations involving 12 floor coverings and 11 adhesives. The floor coverings tested included several kinds of linoleum, felt-base floor coverings having various wearing surfaces, pressed fiberboard, and three strip-wood floors. The bonding agents used included lignin pastes, various resinous cements, casein-latex cement, asphaltic cements, and nails. Installations on both a concrete subfloor and a wood subfloor were tested. Descriptions of the testing equipment and test installations are given. Results showing the relative magnitude of the depressions in the floor coverings caused by the testing equipment are summarized and presented in tables. The appearance of the various installations after 48,000 cycles of the testing equipment is discussed and representative photographs are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS43; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 2. In the second series, 40 test installations were subjected to a performance test in the floor-testing chamber of the National Bureau of Standards. Included in the tests were battleship linoleum, rubber in sheet and tile form, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of asphalt tiles. The bonding agents used included lignin pastes, resinous cements, latex adhesives, rubber cements, cut-back asphalt, and asphalt emulsions. Installations were made on both concrete and wood subfloors. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries showing the performance of the test panels are given, and the appearance of the different floor coverings after 48,000 cycles of the testing equipment is shown by representative photographs.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS59; 1940. Properties of Adhesives for Floor Coverings. An investigation was conducted on adhesives and primers used for bonding linoleum and other floor coverings to subfloors. Tests were made to determine their resistance to both a straight pull and a stripping pull when used to bond 1/8-in. battleship linoleum to concrete, wood, and metal. Specimens were tested in a dry condition and after exposure to moisture. Pieces of linoleum bonded to concrete slabs with selected adhesives and primers were inspected periodically during exposure to moisture. The methods of testing are described and the results are presented in tables.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use In Low-Cost Housing: Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar-resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, strip-wood, and plywood subfloors. Installations on strip-wood subfloors were made with underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given, and photographs of the test panels after 48,000 cycles of the testing equipment are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS73; 1941. Indentation Characteristics of Floor Coverings. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65-percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevated temperature of 90° F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedures are briefly described. Summaries of the results are presented to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 26 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were cork tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given and their appearance at the end of the test is shown by photographs. A few generalized comments and conclusions are made.

U. S. Gov., Federal Specification O-P-106; 1939. Paste; Linoleum. Covers one type and grade. Gives requirements for odor, smoothness and uniformity, alkalinity, bonding, strength, and adhesion; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification LLL-L-351a; 1939. Linoleum; Battleship. Covers one type and grade, in three thicknesses—1/8 in., 3/16 in., and 6 mm. Gives requirements for material, workmanship, color, finish, width, burlap or woven cotton backing, thickness, seasoning, weight, pliability, and water absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-L-354; 1943. Linoleum; Desk-Top. Linoleum shall be of one type and grade and of the size specified in the invitation for bids. Gives requirements for materials, workmanship, color and finish, width and length, woven fibrous backing, finish, thickness, weight, pliability, seasoning, sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-L-359; 1942. Linoleum; Inlaid and Molded. Covers one type and grade in 1/8 in. inlaid-standard and molded-standard. Gives requirements for material, workmanship, color, finish, width, burlap or woven cotton backing, thickness, seasoning, weight, pliability, methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-L-361; 1931. Linoleum; Plain, Inlaid, and Printed. Intended to cover plain, jaspe, granite, straight-line, and moulded inlaid, and printed linoleums. Covers material and workmanship, color, pattern, finish, seasoning; width, burlap backing, indentation, weight and thickness, and pliability; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-L-367; 1942. Linoleum; Plain, Jaspé, and Marbleized. Covers one type and grade, standard and 1/8 in. thick, in plain, jaspé, and marbleized. Gives requirements for material, workmanship, color, finish, width, burlap or woven cotton backing, thickness, seasoning, weight, and pliability; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 52C5b; 1941. Cement; Linoleum.

U. S. Gov., Navy Dept. Specification 52C33; 1945. Cement; Linoleum, Fire-Retardant.

392. COATED, FILLED, AND WATERPROOFED FABRICS

392.0 GENERAL ITEMS

American Society for Testing Materials, D 751-43T; 1943. Tentative Methods of Testing Rubber-Coated Fabrics. For the testing of rubber-coated fabrics made by applying either natural rubber compounds or those synthetic elastomers which are processed on rubber machinery. Gives condition, dimensions and weight, breaking strength, elongation, bursting strength, tearing strength, hydrostatic resistance, and adhesion of coating to fabric.

American Society for Testing Materials, D 815-44 T; 1944. Tentative Method of Test for Hydrogen Permeability of Coated Fabrics. Gives scope, apparatus, test temperature, test specimens, preparation of specimens, balancing period, procedure, and report.

National Assn. of Dyers and Cleaners of the U. S. and Canada. A Test for Water Repellency, No. 125; 1942. For water repellent garments that must retain their water repellency after they have been cleaned. Gives method of testing for water repellents.

392.1 COATED FABRICS

392.11 Enameled Cloth

U. S. Gov., Navy Dept. Specification 27C16c; 1942. Cloth; Enameled, Black.

392.12 Tracing and Blueprint Cloth

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C63; 1917. Specification of the Transparency of Paper and Tracing Cloth. Describes a standard method of specifying the transparency using principle of contrast ratio, description of apparatus and method of test, directions for making application test.

U. S. Gov., Federal Specification CCC-C-531c; 1944. Cloth; Tracing. Covers two types—(I) for ink work and (II) for pencil work; in two classes—(A) white and (B) blue. Gives requirements for fabric, workmanship, samples, weave, thread count, breaking strength, erasing qualities, and opacity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification CCC-C-536; 1931. Cloth; Tracing, Printed. Covers four types—(I) profile, (II) cross-section, (III) logarithmic, and (IV) plan profile. Gives requirements for colors, printing, rulings, fabric, coating, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, *see* 300.4; tracing paper, *see* 478.35; blue print paper, *see* 478.34.

392.13 Varnished Cloth

References.—Varnished cambric cloth and tape and friction tape for electrical purposes, *see* 719.56.

392.2 BOOK AND WINDOW SHADE CLOTH AND WINDOW SHADES

American Hospital Assn., 67-46. Shade Cloth. Covers three types in "firsts." Based on U. S. Gov. Federal Specifications CCC-C-521a for Shade Cloth and CCC-T-191a for General Specifications, Test Methods, Textiles.

392.21 Book Cloth

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS57-40; 1940. Book Cloths, Buckrams, and Impregnated Fabrics for Bookbinding Purposes, Except Library Bindings. This commercial standard establishes standards of quality and test procedure which are intended to apply to book cloths and buckrams which are starch-filled, and to the so-called impregnated fabrics used in the bookbinding industry for edition, textbook, trade, catalogue, and all other than library bindings. It includes general requirements, definitions, specific requirements relative to warp plus filling threads, and breaking strength, tolerances, test conditions, and methods of test. This commercial standard was approved as American Standard CS57-40 by the American Standards Assn. Initiated by Book Manufacturers Institute, Employing Bookbinders of America, and Institute of Book Cloth and Impregnated Fabric Manufacturers.

392.22 Shade Cloth

U. S. Gov., Federal Specification CCC-C-521a; 1937. Amendment 3; 1942. Cloth; Shade. Covers one grade and three types—(I) cambric, (II) Holland, and (III) pyroxylin-impregnated. Covers blackout shades. Gives requirements for ends and picks, thread count, strength, width, and tolerances; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; window shades, *see* 392.23.

392.23 Window Shades

American Hospital Assn., 4-43. Window Shades, Rollers, Slats, Cords, and Accessories. Covers wooden and metal rollers, one type each of cords and slats, and window shades complete. Based on U. S. Gov. Federal Specification DDD-S-251 for Shades, Window Rollers, Slats, Cords, and Accessories; CCC-T-191a for Textiles, General Specifications, Test Methods; and CCC-C-521a for Shade Cloth.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R199-43; 1943. Cloth Window Shades. Covers the kinds of cloth, number of colors, widths, finishes, the number of warp and filling threads for each kind, resistance to cracking, opacity, color fastness, and cleanability for the various cloths. Also lists the lengths and widths of mounted stock shades made from each kind of shade cloth, and diameters and grades of rollers used with each. Sponsored by the Window Shade Institute.

U. S. Gov., Federal Specification DDD-S-251a; 1943. Shades; Window, Rollers, Slats, Cords, and Accessories. Covers three types—(I) class A, translucent cambric shades and class B, opaque cambric shades, (II) Holland shades, and (III) pyroxylin-impregnated shades. Gives requirements for shade cloth, brackets, rollers, ferrules, ends, rollers, slats, cords, workmanship, mounting, color, lengths, widths, hem, roller and springs, and slats; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Shade cloth, *see* 392.22.

392.3 RUBBERIZED FABRIC

U. S. Gov., Army-Navy Aeronautical Specification AN-F-10—1; 1943. Fabric; Aircraft Flotation Equipment, Rubberized.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS32-31; 1931. Cotton Cloth for Rubber and Pyroxylin Coating. A commercial standard selected and accepted by industry covering requirements on textile strengths for various constructions of sheeting, drill, twill, broken twill, and sateen; lengths of cuts, permissible defects, sizing and injurious chemicals, with methods of test. Initiated by Cotton Textile Institute.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-152; 1942. Fabric, Rubberized; Disc, Inlet Valve.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-9B; 1939. Cloth; Sateen, 2-Ply, Rubberized.

References.—Electrical insulating rubberized tape, *see* 719.56; cotton fabric for rubber coating, *see* 304.71; rubber sheeting, *see* 204.33.

392.4 WATERPROOF CLOTH

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Determination of Water Resistance of Fabrics. Defines shower resistance and rain resistance in terms of hydrostatic pressure and time. Describes hydrostatic pressure test, spray test, and immersion test with illustrations of apparatus set-up.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Membrane Waterproofing. Gives requirements for treated fabric.

American Society for Testing Materials, D 173-44; 1944. American Assn. of State Highway Officials, M 117. Woven Cotton Fabrics Saturated With Bituminous Substances for Use in Waterproofing. For use in membrane system of waterproofing. Gives requirements for manufacture, properties of treated and untreated fabric, saturation, sizes, weight, strength, pliability, surface finish, sampling, and testing.

American Society for Testing Materials, D 583-40 T; 1940. Tentative Methods of Test for Resistance of Textile Fabrics to Water. Includes hydrostatic pressure, water penetration (drip), and water absorption (spray) methods. Test liquid, apparatus, specimen, and methods of procedure.

U. S. Gov., Army Air Forces. Specification 16094-E; 1945. Fabric; Waterproofed.

U. S. Gov., Army Air Forces. Specification 16110-1; 1944. Fabric; Gabardine, Cotton, Moisture-Proof.

U. S. Gov., Army-Navy Aeronautical Specification AN-CCC-F-56-4; 1944. Fabric; Processed, Parachute Pack.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 114-43; 1943. Hospital Sheeting for Mattress Protection. To serve as a guide to producers, distributors, and users of sheeting impervious to moisture; used for the protection of hospital mattresses. Gives requirements for thickness, breaking strength, tearing strength, resistance to oil and disinfectants, resistance to sterilization, accelerated aging, cracking and moisture penetration, and burning rate.

U. S. Gov., Federal Specification HH-C-581a; 1935. Cotton Fabric; Woven, Asphalt-Saturated. Covers one type. Gives requirements for appearance, chemical composition, and physical characteristics; methods of inspection, determination of weights and width, sampling, and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-C-591; 1935. Cotton Fabric; Woven, Coal-Tar-Saturated. Covers one type. Gives requirements for appearance, physical properties, and chemical composition; methods of inspection, determination of weights and width, sampling, and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., Specification 277b; 1943. Covers Typewriter; Fabric. Shall be fabric coated with a suitable nonoxidizing plastic material. Grade shall be commercially known as "first" and sizes shall be as specified. Gives requirements for material, workmanship, coating, water permeability, color and finish, and flexibility of coating; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification CCC-C-501; 1936. Cloth; Pyroxylin-Coated. Covers one type, one grade, and four classes—(A) 68 x 72 sheeting, (B) 48 x 48 sheeting, (C) 104 x 64 sateen, and (D) 104 x 64 sateen. Gives requirements for width, length of roll, weight, thread count, breaking strength, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 6-269B; 1943. Cloth; Impermeable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-152A; 1927. Cloth; Waterproofed.

References.—Tolerances, methods of testing, *see* 300.4; asphalt for waterproofing, tar for waterproofing, *see* 505.16, 505.36; oiled waterproof cloth for oilskins, *see* 392.53; waterproof serge, *see* 392.54; cotton fabrics for rubber and pyroxylin coating, *see* 304.71.

392.5 WATERPROOF CLOTHING

392.51 Ponchos

U. S. Gov., Marine Corps Specification, revised 1943. Poncho; Polyvinyl Butyral Filler.

U. S. Gov., Marine Corps Specification, revised 1940. Poncho; Rubberized.

392.52 Slicker

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-249; 1937. Slicker; Oilskin (Alaskan Clothing).

392.53 Oiled Clothing

U. S. Gov., Navy Dept. Specification 37C4; 1932. Clothing; Submarine, Outer.

392.54 Rain Clothing

U. S. Gov., Marine Corps Specification, adopted 1944. Raincoat; Lightweight (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1943. Raincoat; Officers'.

U. S. Gov., Marine Corps Specification, adopted 1943. Trench Coat, With Detachable Woolen Liner and Hood (Marine Corps Women's Reserve).

U. S. Gov., Navy Dept. Specification 55R5a; 1931. Raincoats; Navy Nurse Corps.

U. S. Gov., Navy Dept. Specification 72C1b; 1938. Rain-Clothes (Foul-Weather); Coats; Hats; Trousers.

U. S, Gov., Navy Dept. Specification 72R1a; 1932. Raincoats; Enlisted Men's.

U. S. Gov., Navy Dept. Specification 72R2; 1941. Raincapes; Commissioned Officers'.

U. S. Gov., Navy Dept. Specification 72R3g; 1944. Raincoats; Enlisted Men's, Twill-Fabric.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 20-104A; 1940. Raincoat; Rubberized, M-1938.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 20-108; 1939. Raincoat; Nurses'.

U. S. Gov., Veterans Administration. Specification VA-MC-309; 1941. Fire-Fighters' Coats.

References.—Methods of testing fabrics, definitions, *see* 365.0, 300.4, 300.6; oilskin coat, *see* 392.53.

392.6 OILCLOTH

American Hospital Assn., 67-145. White Table Oilcloth. Covers one type of "firsts." Based on U. S. Gov. Federal Specifications CCC-O-351 for White Table Oilcloth and CCC-T-191a for General Specifications, Test Methods, Textiles.

U. S. Gov., Federal Specification CCC-O-351; 1932. Oilcloth; Table, White. Covers one grade and one type. Gives requirements for width, length of roll, strength, weight, and surface; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

392.7 RUBBERIZED CLOTHING

U. S. Gov., Navy Dept. Specification 37 M 10; 1943. Mittens; Waterproof, N-1.

393. LABELS AND TAGS, WOVEN

U. S. Gov., Army-Navy Aeronautical Specification AN-L-27; 1943. Labels; Garment.

U. S. Gov., Navy Dept. Specification 27L8b; 1944. Labels; Garment.

394. WEBBING

394.1 KHAKI WEBBING

U. S. Gov., Marine Corps Specification, adopted 1941. Webbing; Cotton, Khaki, 7/16-In. (for Helmet Straps).

U. S. Gov., Marine Corps Specification, adopted 1935. Webbing; Khaki, 1 3/8-In.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 6-186; 1934. Webbing; Cotton, Khaki, for Bandoleers.

394.2 OLIVE-DRAB WEBBING

U. S. Gov., Marine Corps Specification, revised 1944. Webbing; Olive-Drab, 1 3/8-In.

394.3 JUTE WEBBING

394.4 WEBBING STRAPS

American Hospital Assn., 13-31. Orthopedic Webbing. Covers one type, one grade, and three sizes—1 in., 1 1/2 in., and 2 in. Based on U. S. Army Specifications 6-197A for Orthopedic Webbing and U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Methods of Tests, Textiles.

U. S. Gov., Navy Dept. Specification 26S1f; 1944. Straps; Standard, Folding-Berth.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 6-49; 1927. Webbing; Cotton (Black).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-221; 1926. Strap; Type ST-18, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-514B; 1942. Straps; ST-19-A and ST-42.

394.5 ELASTIC CORD AND ELASTIC WEBBING

U. S. Gov., Army Air Forces. Specification No. 26596; 1943. Elastic; Parachute Pack Opening.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-15-1; 1944. Webbing; Elastic Cotton.

U. S. Gov., Army-Navy Aeronautical Specification AN-ZZ-C-561-3; 1944. Cord; Elastic, Exerciser.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R112-29; 1929. Elastic Shoe Goring. This recommendation establishes a schedule of stock varieties of unmercerized carded cotton elastic shoe goring covering qualities and widths of the several varieties. Initiated by Webbing Manufacturers Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS58-36; 1936. Woven Elastic Fabrics for Use in Overalls (Overall Elastic Webbing). This standard covers requirements for the material, construction, and methods of testing overall elastic webbing classes and widths—close-weave cord-edge, covered rubber 5/8 to 2 in. and twill-weave, bare rubber 3/4 to 2 in. Initiated by Webbing Manufacturers Institute.

U. S. Gov., Navy Dept. Specification 27W5a; 1937. Webbing; Cotton, Elastic.

U. S. Gov., Navy Dept. Specification 55C28b; 1941. Collars; French, Elastic.

U. S. Gov., Treasury Dept., Procurement Div., No. 500; 1941. Webbing; Elastic, Cotton (Woven). Shall be of the woven type, one grade, and widths as specified. Gives requirements for rubber compound, yarn, workmanship, construction, weave, set, elongation, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 20-23G; 1939. Cord; Elastic, Shock Absorber.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 6-53C; 1941. Webbing; Elastic, Woven.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-197A; 1939. Webbing; Orthopedic.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

394.6 COTTON AND LINEN WEBBING

U. S. Gov., Army Air Forces. Specification No. 16076; 1930. Webbing; Cotton, Hood Lacing.

U. S. Gov., Army Air Forces. Specification No. 16172; 1944. Webbing; Parachute Belt Cotton.

U. S. Gov., Army Air Forces. Specification No. 16174; 1945. Webbing; Woven Pocket, Cotton.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-16; 1944. Webbing; Linen, Linen-Hemp, or Linen-Ramie.

U. S. Gov., Army-Navy Aeronautical Specification AN-JJ-W-151-3; 1943. Webbing; Cotton.

U. S. Gov., Marine Corps Specification, adopted 1937. Webbing; Cotton, Bleached, 1 3/4-in.

U. S. Gov., Marine Corps Specification, revised 1943. Webbing; Cotton, Natural, or in Colors.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-185C; 1941. Webbing; Cotton, Natural or in Colors.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 15-11E; 1942. Webbing; Linen.

395. HATS AND CAPS (EXCEPT STRAW OR OTHER FIBER, OR RUBBER)

395.1 CAPS

Americal Hospital Assn., 67-25. Cotton Operating Caps. Covers one type and one grade in two sizes. Based on U. S. Gov. Federal Specifications DDD-C-48 for Cotton Operating Caps; V-T-276b for Cotton Thread;

CCC-T-181a for General Specifications, Test Methods, Textiles; and DDD-S-751 for Stitches, Seams, and Stitching.

U. S. Gov., Federal Specification DDD-C-44; 1938. Caps; Boys' and Men's. Covers one grade and three types—(I) boys', summer and winter; (II) men's, one-piece-top; and (III) men's, sectional-top, summer and winter. Gives requirements for material, style, construction, and size; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-C-48; 1938. Caps; Operating, Cotton. Covers one type and grade, in large and small sizes. Gives requirements for fabric, construction, size and measurements, thread, and shrinkage; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 73C1c; 1939. Caps; Blue, Cloth.

U. S. Gov., Navy Dept. Specification 73C2d; 1942. Caps; Combination, Blue and White and Covers; Cap.

395.11 Cooks', Bakers', and Nurses' Caps

U. S. Gov., Federal Specification DDD-C-41; 1935. Amendment 2; 1944. Caps; Bakers' and Cooks', White. Covers three types—(I) French (duck, twill, and drill), (II) skull (duck and twill), and (III) turn-up (drill). Gives requirements for material, workmanship, construction, stitches, seams, stitching, proportions, sizes, design, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, adopted 1944. Cap; Messwomen (Marine Corps Women's Reserve).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 15-12A; 1941. Cap; Nurses', White.

U. S. Gov., U. S. Maritime Commission. Specification 55-MC-3a; 1944. Caps; Cooks'. Covers two types—(I) French style and (II) skull style. Gives requirements for muslin, mesh fabric, sewing thread, workmanship, head sizes, seams and stitching, and details for each type; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-X-135b; 1942. Cook's Caps.

395.12 Caps, Winter

U. S. Gov., Army-Navy Aeronautical Specification AN-H-16; 1943. Helmets; Winter Flying.

U. S. Gov., U. S. Army, Army Air Forces. Specification 8-128; 1941. Cap; Mechanic's, Type A-4 (Winter).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3096-A; 1942. Cap; Flying (Winter), Type B-2.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-255A; 1940. Caps; Winter.

395.13 Caps, Dress, Full Dress, Special Dress

U. S. Gov., Marine Corps Specification, revised 1942. Cover; Cap, Blue.

U. S. Gov., Marine Corps Specification, revised 1942. Cover; Cap, Green.

U. S. Gov., Marine Corps Specification, adopted 1944. Cap; Dress, Summer (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1939. Cap; Sky-Blue (Marine Band).

U. S. Gov., Navy Dept. Specification 55C30; 1927. Caps (Hats; and Covers; Hat); Navy Nurse Corps.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-125A; 1942. Cap; Garrison, Blue, Nurses'.

395.14 Olive-Drab Service and Officers' Caps

U. S. Gov., Army Air Forces. Specification No. 3244; 1945. Cap; Nurses Flying, Very Light, Type K-1.

U. S. Gov., Marine Corps Specification, revised 1944. Cap; Garrison, Service, Summer.

U. S. Gov., Marine Corps Specification, revised 1944. Cap; Garrison, Service, Winter.

U. S. Gov., Marine Corps Specification, adopted 1944. Cap; Service, Winter (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, revised 1942. Cover; Cap, Khaki.

U. S. Gov., Navy Dept. Specification 73C4a; 1943. Caps; Garrison, Officers'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-5A; 1934. Caps; Enlisted Men's, Service, Woolen.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-21; 1923. Hats; Service, Olive-Drab, Officers'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-114B; 1942. Cap; Garrison.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 8-130; 1942. Cap; Wool, Knit, M-1941.

395.15 Summer Caps

U. S. Gov., Army-Navy Aeronautical Specification AN-H-15; 1943. Helmets; Summer Flying.

U. S. Gov., Marine Corps Specification, adopted 1941. Cap; Baseball.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-287-A; 1942. Cap; Mechanic's, Type A-3 (Summer).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3095-A; 1942. Cap; Flying (Summer), Type B-1.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-326; 1943. Cap; Herringbone Twill, (O.D. 7) (Stock Nos. 73-C-25731 Thru 73-C-25751).

References.—White caps for marine officers, *see* 395.13.

395.16 Watch Caps

U. S. Gov., Navy Dept. Specification 73C3b; 1943. Caps; Watch.

395.17 White Caps, Marine Band and Officers'

U. S. Gov., Marine Corps Specification, revised 1942. Cover; Cap, White.

References.—White caps, marine officer's, *see* 395.13.

395.18 Fur Caps

395.19 Miscellaneous Caps

U. S. Gov., Marine Corps Specification, adopted 1944. Cap; Garrison, Summer (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Cap; Garrison, Utility (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Cap; Utility.

U. S. Gov., Marine Corps Specification, adopted 1944. Cap; Wool, Knit.

U. S. Gov., Marine Corps Specification, revised 1941. Frame; Cap.

395.2 HATS, EXCEPT STRAW AND RUBBER HATS

395.20 General Items

Textile Color Card Assn. of the U. S., Inc. Men's Hat Colors, 1944. The 1945 spring season card of colors for felt bodies, men's hats, shows three colors in felt with matching ribbon for hat band color.

Textile Color Card Assn. of the U. S., Inc. Millinery Colors, 1944. The 1945 spring millinery colors—listing of colors especially adopted for the three classifications of fur felt, wool felt, and straw hats. Lists 19 colors for fur felt, 22 colors for wool felt, and 12 colors for straw.

Textile Color Card Assn. of the U. S., Inc. Standard Ninth Edition Color Card, 1944. A new master color card for all industries and trades. This is not a card presenting fashion colors for but one season only, but it embraces a complete collection of important staple shades having continued popular acceptance. A Research Associate has been established at the National Bureau of Standards to include the calibration of the 216 colors contained in the Ninth Edition of the Standard Color Card of America and the translation of these standards into the language of scientific equivalents and nomenclature.

395.21 Field Hats

U. S. Gov., Marine Corps Specification, adopted 1939. Hat; Field.

395.22 Blue Denim Working Hats

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-3A; 1937. Hats; Working, Denim.

395.23 Olive-Drab (Nurses') Hats

395.24 Olive-Drab (Officers') Hats

395.25 Hats, Southwester

395.26 Hats, Oiled Squam

395.27 Felt Hats

U. S. Gov., Federal Specification C-H-131; 1935. Hats; Felt and Wool, Men's. Covers two types—(I) felt and (II) wool; in four shapes—Optimo, Telescope, Alpine, and Pinch Front. Gives requirements for felt, wool, other materials, workmanship, forming, sizes, shape, brim, manufacture; detail requirements for color, trimming, and sweat band; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 499a; 1942. Hats; Felt and Wool, Men's. Covers two types—(I) felt and (II) wool. Gives requirements for felt, wool, forming, sizes, shape, brim, manufacture, color, trimming, and sweat band; methods of sampling, inspection, and tests; and packaging, packing, and marking.

395.28 Wool Hats

U. S. Gov., Federal Specification C-H-131, 1935. Hats; Felt and Wool, Men's. Covers two types—(I) felt and (II) wool; in four shapes—Optimo, Telescope, Alpine, and Pinch Front. Gives requirements for felt, wool, other materials, workmanship, forming, sizes, shape, brim, manufacture; detail requirements for color, trimming, and sweat band; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 499a; 1942. Hats; Felt and Wool, Men's. Covers two types—(I) felt and (II) wool. Gives requirements for felt, wool, forming, sizes, shape, brim, manufacture, color, trimming, and sweat band; methods of sampling, inspection, and tests; and packaging, packing, and marking.

395.29 Miscellaneous Hats

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 177. Hat; Hardboiled.

U. S. Gov., Joint Army-Navy Specification JAN-H-47; 1944. Hats; White.

U. S. Gov., Marine Corps Specification, revised 1943. Hat; Rain.

U. S. Gov., Marine Corps Specification, adopted 1944. Hat; Service, Summer (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Hat; Utility (Marine Corps Women's Reserve).

U. S. Gov., Navy Dept. Specification 73H2; 1940. Hats; Cocked.

U. S. Gov., Navy Dept. Specification 73H10; 1944. Hats; Outdoor, Navy Nurse Corps.

396. BALLOON AND AIRSHIP FABRICS

Society of Automotive Engineers. Aeronautical Material Specification No. 3802; 1944. Cloth; Lightweight Airplane, Cotton, Mercerized. Covers application, material, requirements, tests, tolerances, length of cut, length of roll, packaging and marking, approval, and rejections. Similar specifications—Army Air Forces 16128 and Civil Aeronautics Manual Section 04.415.

U. S. Gov., Army Air Forces. Specification 16081-A; 1940. Cloth; Rayon (for Parachutes).

U. S. Gov., Army Air Forces. Specification No. 16123; 1942. Fabric; Rayon, High Tenacity.

U. S. Gov., Army Air Forces. Specification No. 16126 (4); 1943. Fabric; Rayon (for Aerial Delivery Canopies).

U. S. Gov., Army Air Forces. Specification No. 16141; 1943. Cloth; Acetate Rayon (for Parachutes).

U. S. Gov., Army Air Forces. Specification 16154 (1); 1944. Cloth; Viscose Rayon (for Radio Parachutes).

U. S. Gov., Army Air Forces. Specification 16168-A; 1944. Fabric; Coated, Rayon-Nylon, Rip-Stop.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-113-1; 1944. Cloth; Cellulose Nitrate Predoped Airplane.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-121; 1944. Cloth; Mercerized Cotton, Airplane.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-127-1; 1944. Cloth; Nylon, Parachute.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-132-1; 1945. Cloth; Cellulose Acetate Butyrate Predoped Airplane.

U. S. Gov., Army-Navy Aeronautical Specification AN-CCC-C-491-1; 1944. Cloth; Parachute, Saponified-Acetate.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-39G; 1937. Cloth; Balloon, Finished.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-44G; 1936. Fabric; Rubberized, Balloon and Airship.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-232-A; 1941. Cloth; Cotton (for Parachutes).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-110; 1942. Cloth; Cotton, Parachute, Pyrotechnic.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-115; 1943. Cloth; Rayon, for Bomb Parachutes.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-117; 1943. Cloth; Rayon, High Strength, for Flare Parachutes.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-119; 1943. Cloth; Rayon, for Signal Parachutes.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6.

397. RAYON, CELANESE, AND MANUFACTURES THEREOF

397.0 GENERAL ITEMS

American Hospital Assn., 13-25. Oiled Silk. Covers one type, one grade, and two classes—(A) silk and (B) rayon. Based on U. S. Army Specifications 7-17B for Oiled Silk and U. S. Gov. Federal Specification CCC-T-191a for General Specifications, Test Methods, Textiles.

American Institute of Laundering. Service Bulletin 6. How To Launder Curtains. This bulletin tells you how to identify and inspect curtains, how to wash and finish curtains, how to tint curtains, and how light attacks curtain fabrics.

American Institute of Laundering. Service Bulletin 15. How To Launder Silk and Rayon. This bulletin explains identification and washing of rayon, silk, and silk-rayon mixtures, laundering methods for white cotton-rayon and white cotton-silk mixtures, laundering of colored rayon and silk, bleaching of yellowed silks, finishing silks and rayons, common difficulties in laundering silk and rayon pieces.

American Society for Testing Materials, D 258-44; 1944. Methods of Testing and Tolerances for Continuous Filament Rayon Yarns. Applies to the determination of commercial weight and clean; oven-dry weight of continuous filament rayon yarns. Gives definition, apparatus, sampling, net weight, test specimens, boil-off, dry weight, commercial moisture regain, commercial weight, retests, and tolerance.

American Society for Testing Materials, D 276-43T; 1943. Tentative Methods for Identification of Fibers in Textiles. Covers procedures for the identification of textile fibers used commercially in woven, knit, or braided fabrics. Gives reference samples, reagents, apparatus, considerations for sampling, test specimens, mounting specimens, preliminary examination, procedures for various types of fibers, and enlarged photographs of various fibers.

American Society for Testing Materials, D 415-38; 1938. Methods of Test for Strength of Rayon Woven Fabric When Wet. Gives requirements for test specimen, normal and wet strength determinations using A.S.T.M. method D 39, section 10, count, normal and wet, and report for corrected wet strength.

American Society for Testing Materials, D 416-39; 1939. Method of Test for Maximum Residual Shrinkage of Silk and Rayon Woven Fabrics. For use in commercial laundering and for general technical purposes. Requirements for test sample, washing machine, soap solution, washing and pressing, conditioning, and comparison.

American Society for Testing Materials, D 434-42; 1942. Method of Test for Resistance to Yarn Slippage in Silk, Rayon, and Silk-Rayon Woven Fabrics. Covers slippage of filling yarns on warp yarns, or warp yarns on filling yarns, in excess of normal stretch of the fabric under the same load; preparation of specimen, testing machine, standard condition, and test procedure.

American Society for Testing Materials, D 436-37; 1937. Method of Test for Colorfastness of Dyed or Printed Wool, Silk, or Rayon Fabrics to Laundering or Domestic Washing. For washing tests of colored fabrics without use of bleaching agent. Gives apparatus, test specimens, soap solution, procedure, classification, and results.

American Society for Testing Materials, D 507-44; 1944. Methods of Testing and Tolerances for Spun Rayon Yarns and Threads. Applies to spun rayon yarns, both single and plied, and to spun rayon threads. Gives definitions, tolerances, and methods of testing.

American Society for Testing Materials, D 539-40 T; 1940. Tentative Method of Test for Apparent Fluidity of Dispersions of Cellulose Fibers in Cuprammonium Hydroxide. Measure of degradation due to light, acids, alkalies, and oxidizing agents in processing, in laundering, and use; applicable to scoured or bleached cotton and regenerated cellulose rayon textiles which give apparent fluidities of 45 rhes or less. Viscosimeter, reagent storage and analysis, and sample and test.

American Society for Testing Materials, D 540-44; 1944. Methods of Testing Rayon Staple. Gives definitions, methods of testing, denier, length and length distribution, and tensile strength.

American Society for Testing Materials, D 680-44; 1944. Methods of Testing and Tolerances for Certain All-Cotton and Cotton-and-Rayon Fine Fancy Goods. Apply to combed handkerchief cloths, plain combed staples using color in warp or filling; piques and bedford cords woven on dobby looms; other dobby and jacquard weaves, carded or combed; combed shirtings, dress goods, and goods of cotton and rayon mixed yarns manufactured to purchase specifications.

American Society for Testing Materials, D 682-42 T; 1942. Tentative Method of Test for Colorfastness to Atmospheric Gases of Dyed Cellulose Acetate Rayon. Based upon a method developed by the

Research Committee of the American Assn. of Textile Chemists and Colorists.

National Assn. of Dyers and Cleaners of the U. S. and Canada. Identification of Fibers, T-145; 1944. For training employees in the identification of textile fibers. Covers natural fibers and synthetic fibers. Gives method of testing and tests for fiber content of pure silk, weighted silk, wool, cotton, regenerated rayon, cellulose acetate rayon, nylon, vinyon, aralac casein, and glass.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Rayon. Covers definition, characteristics and derivation, types and grades, uses, packing, and substitutes.

Textile Color Card Assn. of the U. S., Inc. Glove Colors, 1944. The 1945 spring season card colors for women's gloves includes 17 colors.

Textile Color Card Assn. of the U. S., Inc. Rayon Colors, 1944. The 1945 spring season color card of America—44 colors shown in rayon fabrics—featuring collections of petal pastels and heroic colors.

Textile Color Card Assn. of the U. S., Inc. Standard Ninth Edition Color Card, 1944. A new master color card for all industries and trades. This is not a card presenting fashion colors for but one season only, but it embraces a complete collection of important staple shades having continued popular acceptance. A Research Associate has been established at the National Bureau of Standards to include the calibration of the 216 colors contained in the Ninth Edition of the Standard Color Card of America and the translation of these standards into the language of scientific equivalents and nomenclature.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS65-43; 1943. Methods of Analysis and of Reporting Fiber Composition of Textile Products. This standard provides methods of analyzing finished products composed of cotton, rayon, silk, or woolen fiber, and mixtures of two or more of such fibers, and determining the percentage by weight of each kind of fiber present, and the percentage by weight of total sizing, finishing, and other non-fibrous materials; provides methods of reporting on same; includes definitions of these fibers; and illustrates the manner by which testing laboratories may certify that the analyses have been conducted in accordance with the methods of the standard.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-67; 1939. Cloth; Cotton, Mercerized, for Bomb Parachutes.

References.—Nitrocellulose and tests of cellulose compounds, *see* 846.5.

397.1 RAYON KNIT GOODS

397.10 General Items

American Institute of Laundering. Service Bulletin 23. How To Launder Hosiery. This bulletin explains how hosiery should be classified, turning rayon and silk hosiery before washing, using as short a washing formula as possible, what is meant by "dull-luster" hosiery and "run-proof" hosiery, finishing precautions for garterless hose, and common hosiery laundering problems.

397.11 Socks and Stockings of Rayon

U. S. Gov., Treasury Dept., Procurement Div., No. 541; 1942. Stockings; Cotton, Rayon (Infants, Misses', and Women's). Covers three types—(I) infants (cotton, ribbed), (II) misses' and children's (cotton, ribbed mercerized), and (III) women's (full length); and two classes—(A) mercerized cotton and (B) rayon. Gives requirements for material, construction, methods of measuring, dimensions, length of foot, length of leg, size, tolerance, seams, color, shrinkage, finish, pairing, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Standard sizes, methods of measurement, standard colors of hosiery, *see* 309.2; methods of testing fabrics, *see* 397.0, 300.4.

397.12 Rayon Underwear

References.—Methods of measuring underwear, *see* 309.4; methods of testing fabric, *see* 397.0, 300.4.

397.13 Hoods and Toques of Rayon

397.14 Jerseys and Sweaters of Rayon

U. S. Gov., Marine Corps Specification, adopted 1937. Shirt; Basketball.

397.15 Rayon Mufflers and Scarfs

U. S. Gov., Navy Dept. Specification 55N2g; 1944. Neckerchiefs; Rayon, Black.

U. S. Gov., Navy Dept. Specification 73M1a; 1942. Mufflers; Rayon, White.

397.16 Rayon Cloth

U. S. Gov., Army Air Forces. Specification 16081-A; 1940. Cloth; Rayon (for Parachutes)

U. S. Gov., Army Air Forces. Specification No. 16123; 1942. Fabric; Rayon, High-Tenacity.

U. S. Gov., Army Air Forces. Specification 16126 (4); 1943. Fabric; Rayon (for Aerial Delivery Canopies).

U. S. Gov., Army Air Forces. Specification 16142-A; 1945, Cord; Saponified Acetate Rayon.

U. S. Gov., Army Air Forces. Specification 16144-1; 1945. Cloth; Acetate Rayon, High Impact.

U. S. Gov., Army Air Forces. Specification 16150-A; 1944. Cloth; Rayon Lining.

U. S. Gov., Army Air Forces. Specification 16154 (1); 1944. Cloth; Viscose Rayon (for Radio Parachutes).

U. S. Gov., Army Air Forces. Specification No. 16173; 1944. Fabric; Coated Acetate Rayon Satin, Fluorescent.

U. S. Gov., Army Air Forces. Specification No. 16175; 1945. Cloth; Nylon Oxford.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-104; 1943. Cloth; Acetate Rayon.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-115-1; 1944. Cloth; Cotton Back Rayon Twill.

U. S. Gov., Marine Corps Specification, adopted 1944. Cloth; Cellulose Acetate Rayon, White.

U. S. Gov., Marine Corps Specification, adopted 1933. Lining; Rayon, Green (for Officers).

U. S. Gov., Marine Corps Specification, adopted 1943. Lining; Rayon, Viscose, Green.

U. S. Gov., Navy Dept. Specification 27L9; 1941. Lining; Rayon, Black Satin.

U. S. Gov., Navy Dept. Specification 27L10; 1943. Lining; Rayon, Black, Twill.

U. S. Gov., U. S. Army, Army Air Forces. Specification 7-22; 1944. Cloth; Rayon, for Tow Targets.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-108; 1942. Cloth; Cartridge, Rayon.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-115; 1943. Cloth; Rayon, for Bomb Parachutes.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-117; 1943. Cloth; Rayon, High Strength, for Flare Parachutes.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-119; 1943. Cloth; Rayon, for Signal Parachutes.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 7-19A; 1944. Cloth; Rayon (Lining).

397.19 Miscellaneous Items, Rayon

U. S. Gov., Army Air Forces. Specification 16125-A (6); 1944. Tape; Rayon.

U. S. Gov., Army Air Forces. Specification No. 16141; 1943. Cloth; Acetate Rayon (for Parachutes).

U. S. Gov., Army Air Forces. Specification No. 16170; 1944. Cloth; Rayon Twill.

U. S. Gov., Army Air Forces. Specification No. 16171; 1944. Cloth; Rayon Acetate Satin, Fluorescent.

U. S. Gov., Marine Corps Specification, adopted 1944. Cap; Machine Operators (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1944. Coat; Dress, Summer, "A," Officers' (Marine Corps Women's Reserve).

U. S. Gov., Marine Corps Specification, adopted 1941. Guidon; U.S.M.C.

U. S. Gov., Marine Corps Specification, adopted 1944. Skirt; Dress, Summer, "A," Officers' (Marine Corps Women's Reserve).

U. S. Gov., Navy Dept. Specification 27R2c; 1944. Ribbon; Rayon, Black.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 7-21; 1943. Tape; Rayon.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-116; 1943. Cordage; Rayon, Braided and Woven.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-118; 1943. Cordage; Rayon, Braided, for Flare Parachutes.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 7-14; 1929. Cap Band Ribbon and Detachable Cap Bands; Rayon (for Enlisted Men's Dress Caps).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 7-15C; 1944. Braid; Cord-Edge.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 7-20; 1942. Braid; Cord-Edge, Caps, Garrison (for General Officers, Officers, and Warrant Officers).

U. S. Gov., U. S. Army, Signal Corps. Specification 72-45-A; 1943. Panel Set, AP-50-B.

U. S. Gov., Veterans Administration. Specification VA-X-88d; 1941. Thread; Rayon Floss.

397.2 NYLON

U. S. Gov., Army Air Forces. Specification No. 16143; 1943. Cord; Nylon, Flat Braided.

U. S. Gov., Army Air Forces. Specification No. 16153; 1943. Cord; Tubular Woven Flat Nylon.

U. S. Gov., Army Air Forces. Specification No. 16162; 1944. Cloth; Rayon Milanese Knit.

U. S. Gov., Army Air Forces. Specification No. 16165; 1944. Fabric; Coated Nylon.

U. S. Gov., Army Air Forces. Specification No. 16166; 1944. Duck; Coated Nylon.

U. S. Gov., Army Air Forces. Specification No. 16169; 1944. Cloth; Nylon, for Flying Clothing.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-63a-1; 1944. Cord; Nylon.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-127-1; 1944. Cloth; Nylon Parachute.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-9-3; 1943. Thread; Nylon.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-45; 1944. Tape; Nylon (Cotton Filling).

U. S. Gov., Army-Navy Aeronautical Specification AN-W-10a; 1943. Webbing; Tubular Nylon.

397.3 CELLULOSE FABRIC

U. S. Gov., Army-Navy Aeronautical Specification AN-CCC-C-491-1; 1944. Cloth; Parachute, Saponified-Acetate.

U. S. Gov., Federal Specification L-C-166; 1942. Cellulose; Absorbent, Surgical. Covers one type and one grade in rolls or flat packages of 2, 5, or 8 lb. Gives requirements for material, workmanship, absorbency, water-soluble substances, ash, size, weight, moisture, and groundwood and unbleached pulp; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

398. ABSORBENT COTTON, GAUZE, AND SURGICAL DRESSING

398.1 ABSORBENT COTTON

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Purified Cotton (Absorbent Cotton). Description, solubility, ash, alkali or acid, dyes, fatty matter, water-insoluble substances, fiber length, sterility, absorbency, and storage.

U. S. Gov., Federal Specification JJJ-C-561a; 1943. Cotton; Absorbent. Covers Grades A and B, sterilized in rolls, and sterilized in packages. Gives detail requirements as to fiber length, absorbency, methods of sampling, inspection and tests, and packing instructions.

U. S. Gov., Navy Dept. Specification 57C7; 1940. Cotton; Absorbent.

References.—Standard cotton grades, *see* 300.1.

398.2 GAUZE

398.21 Plain Gauze

American Hospital Assn., 13-16. Plain Gauze. Covers one grade and seven types. Based on U. S. Gov. Federal Specification CCC-G-101a.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Absorbent Gauze (Gauze, Plain Gauze, Non-Sterilized Absorbent Gauze). Description, thread count, weight, ash, absorbency, water extract, acid or alkali, dextrin or starch, fatty matter, dyes, and storage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation

R86-42; 1942. Surgical Gauze. This recommendation establishes standard stock sizes and varieties covering widths and construction of surgical gauze and crinoline in 100-yd. bolts, and construction, widths, and lengths of bandage rolls and bandages, construction and length of package goods. This 1942 revision was undertaken at the request of the U. S. Gov., War Production Board.

U. S. Gov., Federal Specification CCC-G-101b; 1943. Gauze, Plain. Covers one grade of bleached gauze and commercial designations as seven types—(I) 44-36, (II) 32-28, (III) 28-24, (IV) 24-20, (V) 22-18, (VI) 20-16, and (VII) 20-12. Gives requirements for cleanliness, sterility, color, and details for each type; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2469; 1939. Gauze; Plain, Sterilized.

References.—Tolerances, methods of testing, definitions, *see* 300.4, 300.6; gauze bandages, gauze dressings, *see* 398.31, 398.34.

398.22 Sublimated Gauze

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2461; 1939. Gauze; Sublimated.

398.23 Iodoform Gauze

398.24 Adhesive Gauze

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Adhesive Absorbent Gauze (Adhesive Absorbent Compress). Description, sterility, and storage.

398.25 Sterile Gauze

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sterile Absorbent Gauze (Sterile Gauze). Description, dimensions, sterility, and storage.

398.3 SURGICAL DRESSING

398.31 Bandages

American Hospital Assn., 13-4. Muslin Bandage. Covers one type, one grade, and two sizes—3 in. and 5 in.

American Hospital Assn., 13-7. Compressed Gauze Bandages. Based on U. S. Gov. Federal Specifications DDD-B-51.

American Hospital Assn., 13-10. Plain Roller Gauze Bandages. Covers one type and one grade in six sizes. Based on U. S. Gov. Federal Specifications DDD-B-61a.

American Hospital Assn., 13-13. Plaster-of-Paris Bandages. Covers one type, one grade, and one class in four sizes. Based on U. S. Gov. Federal Specifications GG-B-101a for Plaster-of-Paris Bandages and CCC-G-101a for Plain Gauze.

U. S. Pharmacopoeial Convention. Pharmacopoeia of the U. S. A. Twelfth Revision, 1942. Gauze Bandage (Roller Gauze Bandage). Description, thread count, width, length, weight, absorbency, other requirements, sterility, and storage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R86-42; 1942. Surgical Gauze. This recommendation establishes standard stock sizes and varieties covering widths and construction of surgical gauze and crinoline in 100-yd. bolts, and construction, widths, and lengths of bandage rolls and bandages, construction and length of package goods. This 1942 revision was undertaken at the request of the U. S. Gov., War Production Board.

U. S. Gov., Federal Specification GG-B-101b; 1943. Bandages; Plaster of Paris. Covers one type, one grade, and five sizes—3 in. by 3 yd., 2 in. by 5 yd., 3 in. by 5 yd., 5 in. by 5 yd., and 6 in. by 5 yd. Gives requirements for material, workmanship, description, amount of plaster, sizing, individual packages, and leakage; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification JJ-B-102; 1944. Bandages; Cotton, Elastic (Washable). Covers one type, one grade, and three sizes. Gives requirements for material, workmanship, construction, elasticity, number of ends and picks, tolerances, tensile strength, weight, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification JJ-B-111; 1944. Bandages; Suspensory, Cotton. Covers one type, grade, and class. Gives requirements for cotton jean, cloth (jersey), tape (binding), drawstrings, waistband, thread, buckle, workmanship, stitching, seams, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification CCC-C-665; 1943. Crinoline; Surgical. Covers one type, one grade, and two sizes—(1) 100 yd. by 36 in. and (2) 6 yd. by 36 in. Gives requirements for material, workmanship, test specimen, tolerances, dimensions, description of put-up, sizing, finishing, and nonfibrous materials; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DDD-B-51a; 1943. Bandages; Gauze, Compressed. Covers one type and one grade. Gives requirements for sizes, material, workmanship, description, and compression; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-B-61a; 1938. Amendment 2; 1944. Bandages; Gauze, Roller, Plain. Covers one grade and one type in six sizes. Gives requirements for material, workmanship, description, and sterility; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-B-81; 1942. Bandages; Muslin (Unbleached), Roller. Covers one type, one grade, and four sizes—(1) 1 in. by 5 yd., (2) 2 in. by 5 yd., (3) 3 in. by 5 yd., and (4) 5 in. by 5 yd. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div. No. 691; 1944. T-Binders; for Hospital Use. Covers one type. Gives requirements for sheeting, thread, workmanship, construction, stitching, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 715; 1945. Scultetus-Binders, for Hospital Use. Covers one type. Gives requirements for material, workmanship, construction, front unit, back unit, stitches, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2462; 1939. Bandage; Gauze, Adhesive.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2486A; 1944. Bandage; Triangular.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2524; 1939. Bandage; Suspensory.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2553; 1939. Bandage; Canton, Flannel.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2974A; 1940. Bandage; Flannel, 3-in.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3007; 1942. Bandage; Derby.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-109; 1940. Unbleached Muslin Bandages.

References.—Gauze, surgical dressings, *see* 398.21, 398.34; rubber bandages, adhesive plaster, *see* 204.11, 204.12.

398.32 Compresses

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2470; 1939. Bandage; Gauze, Compress.

398.33 Surgical Tape

References.—Adhesive tape, *see* 204.12.

398.34 Gauze Dressings, Pads, Etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R133-38; 1938. Surgical Dressings. This recommendation covers nomenclature, materials, sizes, and methods of preparation and folding of surgical dressings. Initiated by American College of Surgeons and the American Hospital Assn.

U. S. Gov., Federal Specification DDD-N-101; 1943. Napkins; Gauze, Sterile, Dental. Covers one type, grade, size, and color. Gives requirements for material, workmanship, cutting, size, and sterilization; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 607; 1943. Sponges; Surgical (All Gauze and Gauze and Cotton). Covers two types—(I) all gauze and (II) gauze and cotton; and three classes—(A) 8 ply, (B) 12 ply, and (C) 16 ply. Gives requirements for gauze, absorbent cotton, tolerances, variations, construction, and size and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 608; 1943. Pads; Obstetrical. Covers one type and one grade and three classes—(A) light weight, (B) medium weight, and (C) heavy weight. Gives requirements for filler, covering, cotton, gauze, construction, dimensions, weight, color, acidity, absorbency, ash, and moisture; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-277; 1939. Cotton Rolls; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2991; 1941. Dressing; Gauze, Surgical.

References.—Gauze, bandages, *see* 398.21, 398.31.

399. MISCELLANEOUS TEXTILE MANUFACTURES

399.1 BRASSARDS

U. S. Gov., Marine Corps Specification, adopted 1940. Bands; Arm (Brassards) for Recruiting Service.

U. S. Gov., Marine Corps Specification, adopted 1943. Brassards (Military Police and Fire Dept.).

U. S. Gov., Navy Dept. Specification 71M3a; 1944. Marks; Sleeve.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-16B; 1945. Brassards.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-S19; 1939. Insignia and Brassard, Embroidered.

399.2 CLOTH BUCKETS AND BASINS

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-68. Bucket; Canvas, Folding.

U. S. Gov., Marine Corps Specification, adopted 1941. Basin; Canvas, Folding.

U. S. Gov., Marine Corps Specification, revised 1944. Bucket; Canvas, Folding.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-265A; 1941. Bucket; Canvas, Collapsible.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-67B; 1938. Bucket; Watering, Canvas, 18-Qt.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-216B; 1942. Bucket; Canvas, Folding, 8-Qt.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-219A; 1941. Basin; Canvas, Folding.

399.3 CASES OF CLOTH

U. S. Gov., Marine Corps Specification, revised 1944. Case; Canvas, Dispatch, M-1942.

U. S. Gov., Marine Corps Specification, revised 1944. Roll; Bedding.

U. S. Gov., Marine Corps Specification, revised 1944. Roll; Clothing.

U. S. Gov., Navy Dept. Specification 24C18c; 1944. Cases; Canvas, Bedding-and-Ward-Furniture.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 6-304; 1941. Case; Canvas, Demolition Kit, Infantry.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 6-305; 1941. Cases; Canvas, Planetable and Tripod.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-12; 1940. Box; Metal, Cavalry, Demolition, With Canvas Case and Carrying Strap.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-148A; 1941. Blanket Set; Large; Case, Empty.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-149A; 1941. Blanket Set, Small; Case, Empty.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-150A; 1929. Case; Surgical Instruments, Canvas, Empty.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-262A; 1940. Cover; Canvas, for Chest, Pack.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-263; 1939. Cases; Cotton, for Dental Instruments and Burs.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-264; 1939. Case; Canvas, for Veterinary Instruments.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-266A; 1941. Case; Tent Pin.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-267; 1939. Case; Splint Set.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-281A; 1942. Case; Stomach and Rectal, Empty.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 6-142B; 1939. Cover and Case; Textile, Ordnance Equipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-238A; 1941. Roll; Bedding, Waterproofed, M-1935.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-285B; 1942. Cases; Canvas, Dispatch, M-1938.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-292; 1942. Kit; Canvas, Utensils.

U. S. Gov., U. S. Army Signal Corps. Specification 71-433-A; 1944. Pouch; CS-35-A (for Knife and Pliers).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-557B; 1942. Case; Type CS-49, Carrying, for Telegraph Set, Type TG-5.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-611A; 1940. Case; Type CS-41, for Generator, GN-35.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-673A; 1938. Roll; Type BG-56A, for Carrying Mast Sections.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-674; 1933. Roll; Type BG-58, for Carrying Mast Sections and Generator Legs.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-714A; 1939. Cover; Radio Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-901A; 1940. Cover; Type BG-70A, for Radio Pack.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-28A; 1927. Case; Type CS-18.

399.4 SLINGS

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-240; 1936. Slings; Drum, Web.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-294; 1943. Sling; Color, Web.

399.5 CUSHIONS AND COVERS

U. S. Gov., Navy Dept. Specification 27C24a; 1942. Covers; Cushion (Boat-Seat).

References.—Rubber cushions, *see* 204.25.

399.6 HOSE

References.—Rubber, linen, and cotton hose, *see* 202.

399.7 WICKS

American Society for Testing Materials, D 219-36; 1936. American Petroleum Institute Standard, 503-36. American Standards Assn., Z11.19-1936. Method of Test for Burning Quality of Long-Time Burning Oil for Railway Use. For special kerosene oil used in railway semaphore signal lamps; includes standard semaphore lamp; dimensions of burner; gray round felt wick, and chimney; sight gage and test procedure.

U. S. Gov., Navy Dept. Specification 31B2b; 1934. Wicks (Burners; Chimneys); Running-Light (Oil-Burning).

399.8 TYPEWRITER RIBBONS

References.—Typewriter, hectograph, and other machine ribbons, *see* 932.2.

399.9 TEXTILE PRODUCTS NOT ELSEWHERE CLASSIFIED

American Society for Testing Materials, D 578-44T; 1944. Tentative Methods of Testing and Tolerances for Glass Yarn. For continuous filament and staple glass yarns, both single and plied, and both single and multiple wound. Gives definitions, breaking strength tolerances, glass content, test procedures for single strand, twist, yarn diameter, and glass content.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Dry Cleaning Department, 1940. Includes a classification of garments for dry cleaning purposes.

U. S. Gov., Marine Corps Specification, adopted 1905. Knots; Shoulder and Aiguillettes, Second Leader, Marine Band.

U. S. Gov., Marine Corps Specification, adopted 1912. Sling; Trumpet, Dress.

U. S. Gov., Navy Dept. Specification 55F6b; 1942. Frogs; Cape.

U. S. Gov., Navy Dept. Specification 71A1; 1937. Aiguillettes.

U. S. Gov., Navy Dept. Specification 71L1b; 1942. Lace; Gold.

U. S. Gov., Navy Dept. Specification 74S1; 1941. Sword-Knots.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-39C; 1941. Cloth; Cartridge, Silk, Wool, or Mohair.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-17; 1938. Lace; Gold.

References.—Asbestos textiles, yarns and packing, *see* 545.4.

400-499 WOOD AND PAPER

400-409 LUMBER (LOGS, TIMBER, AND OTHER UNMANUFACTURED OR PARTLY MANUFACTURED WOOD)

400.0 LUMBER STANDARDIZATION

American Society for Testing Materials, D 9-30; 1930. Definitions of Terms Relating to Timber. Defines structural timber, terms relating to wood, standard defects, standard names for structural timbers, and appendix covering details for knots.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-907-41; 1941. Lumber. Nomenclature for commercial softwood and hardwood, use classification listings, grading provisions, shipping and inspection, measurement, lengths, car lumber, grading classification. Description of grades, vertical sheathing and exposed roofing, horizontal sheathing, finish, flooring and sills, battens, facing, lining, running boards and steps, baffle boards, nailing plank and nailing sills, bearers, bolsters, bumpers, planks, ridge poles, purlins, belting, braces, posts, and definitions of terms and defects.

National Lumber Manufactures Assn. Lumber Literature—A Bibliography. This booklet lists and describes briefly printed information available through the Federated Associations of lumber manufacturers which compose the National Lumber Manufacturers Assn. Printed material available through the latter association also is listed. Practically all commercially important American species of woods are available through the member mills of the Federated Assn. Therefore, this listing includes most of the literature available on lumber and its use.

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Includes physical, chemical, and mechanical properties of wood, timber quality—strength relations, glossary of lumber terms, abbreviations of lumber terms, board measure, lumber quantity costs, sizes of American standard yard lumber and timbers, notations and technical symbols, properties of American standard lumber sizes; design data and formulae for computing sizes of beams, columns, and plank and laminated floors; tables of beam sizes required to support a given load over a given span; tables of least dimensions for columns required to support a given load for various column lengths; and tables for sizes of plank and laminated floors of various thicknesses for safe uniform load for a given span.

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Supplement 1; 1943. Working Stresses for Structural Lumber. Includes general discussion, determination of required sizes, allowable unit stresses, and timber column formula; and table showing stresses for joists and planks, beams and stringers, and posts and timbers for kinds of lumber.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, rules for grading Douglas fir, rules for grading Sitka spruce, rules for grading West Coast (Western) hemlock, rules for grading Western red cedar, and American lumber standard sizes and grades.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; grading rules for Ponderosa pine; grading rules for Idaho white pine; grading rules for sugar pine; and standard manufactured sizes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R16-39; 1939. Lumber (American Lumber Standards for Softwood Lumber). This recommendation represents the lumber industry's efforts to simplify sizes, nomenclature, and grades of softwood lumber, and to attain uniformity in practice. Standards set up covering classifications, grading marking and grading rules; sizes and grade standards for yard lumber; size standards for factory and shop lumber; classification and general provisions for structural lumber; sizes and grade standards for shingles; nomenclature of commercial softwoods; definitions of terms used in describing standard grades for lumber; American standard patterns for worked lumber; moldings; and standard lumber abbreviations. Initiated by the Central Committee on Lumber Standards and the National Lumber Manufacturers Assn.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 5-1A; 1928. Wood; Fuel.

400.1 PHYSICAL ANALYSIS OF LUMBER

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Includes physical properties of wood—wood structure, hardwoods and softwoods, heartwood and sapwood, rings of annual growth, springwood and summerwood, density and rate of growth, grain and texture, weights of wood, moisture in wood, heat transmission, and electrical properties.

400.12 Properties and Uses of Lumber

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Classification of the Uses of Lumber and Timber Under American Railway

Engineering Assn. Specifications. Covers bridge and construction timber, buildings—light-framed construction, buildings—heavy-framed construction, and miscellaneous roadway material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS25; 1939. Structural Properties of Conventional Wood-Frame Constructions for Walls, Partitions, Floors, and Roofs. The Forest Products Laboratory built 39 specimens representing conventional wood-frame constructions for walls, partitions, floors, and roofs. In addition, six wall frames without covering were built. The wall-frame specimens were subjected to compressive and transverse loads; the wall and partition specimens to compressive, transverse, concentrated, impact, and racking loads; the floor specimens to transverse, concentrated, and impact loads; and the roof specimens to transverse and concentrated loads. The transverse, concentrated, and impact loads were applied to both faces of wall specimens. For each of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured, except for concentrated loads, for which the set only was determined. The results are presented in graphs and in tables.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS30; 1939. Structural Properties of a Wood-Frame Wall Construction; sponsored by the Douglas Fir Plywood Assn. The Douglas Fir Plywood Assn. submitted 18 specimens representing a wood-frame wall construction. The sheathing on the outside face and the wallboard on the inside face were both Douglas fir plywood. The specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. the transverse, concentrated, and impact loads were applied to both faces of the specimens. For each of these loads, three like specimens were tested, the concentrated-load tests being made on undamaged portions of the impack specimens. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented in graphs and in a table.

400.13 Tests of Lumber

American Society for Testing Materials, D143-27; 1927. American Standards Assn., 04a-1927. Methods of Testing Small Clear Specimens of Timber. Selection, preparation, and storage of test specimens, test procedure for static and impact bending, tension, compression, hardness, shear, cleavage, specific gravity. shrinkage, and moisture content.

American Society for Testing Materials, C 160-41T; 1941. Tentative Method of Test for Fire-Retardant Properties of Wood. Covers the procedure for fire tests applicable to untreated wood and wood chemically treated by impregnation to reduce flammability for permanent use in construction. Sampling, apparatus, test specimens, conditioning of test specimens, procedure, and report.

American Society for Testing Materials, D 198-27; 1927. American Standards Assn., 04b-1927. Methods of Static Tests of Timbers in Structural Sizes. Covers number and sizes of test specimens, moisture control, apparatus, and procedure for static bending test, for compression, and for minor tests; permissible variations and sample data sheets.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-3; 1942. Wood; Determination of Moisture Content of.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-4a; 1942. Wood; Determination of Specific Gravity of.

400.14 Inspection of Lumber

Technical Assn. of the Pulp and Paper Industry. Species Identification of Wood and Wood Fibers. Suggested Method T 8 sm-40; 1940. Directions for identifying woods and wood fibers on the basis of structure. Covers apparatus, reagents, test specimens, reference standards, procedure, the structure of wood, illustrations, keys for various woods, and appendix.

U. S. Gov., Navy Dept. General Specifications for Inspection of Materials, 1941, Appendix IV, Lumber and Timber (Manufacture, Kiln-Drying, Grading, Inspection, and Shipping, 1941).

400.15 Kiln Drying of Lumber

U. S. Gov., Army Air Forces. Specification 20035; 1944. Procedure for Certification of Kiln-Drying Facilities and Operators.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-136; 1944. Certification of Operators and Approval of Kiln-Drying Equipment; Process for.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-2a-2; 1944. Wood; Method for Kiln-Drying.

400.2 SOFTWOOD GRADING RULES

400.20 General Items

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1941. American Lumber Standards for Softwood Lumber. Gives general definition, classifications, and general grading rule provisions; yard lumber grade standards, size standards, strips, boards, dimensions, factory flooring, heavy roofing, decking, and sheet piling; siding, flooring, ceiling, partition, shiplap, and dressed and matched; factory and shop lumber; structural lumber; and shingles.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Lumber; Commercial Softwood. Covers definition, classification, uses, lumbering and manufacturing, gradings, purchasing practices, shipping, and marketing.

National Lumber Manufacturers Assn. Lumber Grade-Use Guide Pamphlet I; 1943. Softwood Lumber. Covers standards for softwood lumber, certified and guaranteed lumber, softwood yard lumber, softwood structural lumber, doors, sash, frames, screens, softwood plywood, softwood interior paneling, specification and use of softwood lumber, and lumber abbreviations.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 12; 1943. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, rules for grading Douglas fir, rules for grading Sitka spruce, rules for grading West Coast (Western) hemlock, rules for grading Western red cedar, and American lumber standard sizes and grades.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R16-39; 1939. Lumber (American Lumber Standards for Softwood Lumber). Standard Lumber Abbreviations. Gives a list of standard lumber abbreviations for use in contracts and other documents arising in the transactions of purchase and sale of American standard lumber. Initiated by the Central Committee on Lumber Standards and the National Lumber Manufacturers Assn.

400.21 Cedar Grading Rules

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cedar; Eastern Red. Covers definition, source, classification, standard grades, thicknesses and weights, characteristics, method of production, uses, and purchasing practices.

Northern Hemlock and Hardwood Manufacturers Assn. Lumber Grade-Use Guide Pamphlet VI; 1943. Endorsed by the National Lumber Manufacturers Assn. Eastern Hemlock, Tamarack, and Northern White Cedar. Presents information on the specification and use of shingles and posts for buildings and other structures. Lists a condensed lumber grade-use guide showing the items and grades in which these woods are manufactured and available and the uses for which their grades may be best employed, sizes of lumber and shingles, and a brief description of the quality of each standard grade and items available.

West Coast Lumbermen's Assn. Lumber Grade-Use Guide Pamphlet IV; 1943. Endorsed by the National Lumber Manufacturers Assn. Douglas Fir, West Coast Hemlock, Western Red Cedar, and Sitka Spruce. Presents the grades for buildings and other structures and gives the uses for which these grades may be best employed. Lists a condensed lumber grade-use guide and lists the uses of the grades in building and other construction.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 12; 1943. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, and grading rules for Western red cedar.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1942. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and rules for grading red cedar and incense cedar.

U. S. Gov., Navy Dept. Specification 39C3e; 1944. Cedar; White (Chamaecyparis Thyoides and Thuja Occidentalis).

U. S. Gov., Navy Dept. Specification 39C6e; 1944. Cedar; Port Orford and Alaska Yellow.

References.—American Lumber Standards, nomenclature and basic grading rules, *see* 400.0, 400.20.

400.22 Cypress Grading Rules

Southern Cypress Manufacturers Assn. Lumber Grade-Use Guide Pamphlet III; 1943. Endorsed by the National Lumber Manufacturers Assn. Tidewater Red Cypress. Gives information on the specifications and use for buildings and other structures. Lists the range of standard grades recommended to be employed for the different uses, gives standard sizes of lumber, and gives a brief description of the quality of each standard grade with typical illustrations.

Southern Cypress Manufacturers Assn. Standard Specifications for Grades of Tidewater Red Cypress—Structural Stress Grades—Grade Marks and Rates of Charges for Inspection and Reinspection Service, 1943. Includes general instructions, grading provisions, nominal and dressed sizes, rough dry sizes, lengths, description, measurement, tally, shipping and inspection provisions; grades for yard lumber, factory lumber, timber and railroad material, and miscellaneous; definitions of defects and blemishes; patterns; percentage tables; structural stress grades; grades marks; certificates of inspection; and rate of charges for inspection and reinspection services.

References.—American Lumber Standards, nomenclature and basic grading rules, *see* 400.0, 400.20.

400.23 Fir Grading Rules

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Douglas Fir. Covers definition, constants, occurrence, grades and forms available, and uses.

Northeastern Lumber Manufacturers' Assn., Inc. Standard Grading Rules for Eastern Spruce and Balsam Fir, 1938. Covers general instructions, yard and industrial size standards, measurement, and tally; inspection and shipping provisions; definitions of defects; inspection rules for B and Btr. (clear), C select (No.1), selected merchantable (No.2), No. 1 (merchantable), No.2 (No.4), No.3 (No.5), and structural joist and plank.

Northern Pine Manufacturers Assn. Standard Grading Rules for Balsam Lumber; 1939. Conforms to American Lumber Standards and includes standard sizes for dressed lumber; standard size of rough lumber; general instructions on grading; sizes, measurements, and tally; inspection and shipping provisions; definitions of defects and blemishes; association standard grades for selects, bevel siding, boards and strips, dimension and timbers, shop, and lath.

West Coast Lumbermen's Assn. Lumber Grade-Use Guide Pamphlet IV; 1943. Endorsed by the National Lumber Manufacturers Assn. Douglas Fir, West Coast Hemlock, Western Red Cedar, and Sitka Spruce. Presents the grades for buildings and other structures and gives the uses for which these grades may be best employed. Lists a condensed lumber grade-use guide and lists the uses of the grades in building and other construction.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West

Coast Hemlock, Western Red Cedar Lumber, No. 12; 1943. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, and grading rules for Douglas fir.

Western Pine Assn. Lumber Grade-Use Guide Pamphlet V; 1943. Endorsed by the National Lumber Manufacturers Assn. White Fir. Gives information on its standard grades and sizes and specifications and use of certain grades recommended for specific purposes. Lists the recommended grades for building purposes and other uses, gives unretouched photographic reproductions of the yard grades and a table giving the standard manufactured sizes for various workings, and a brief description of the standard grades.

Western Pine Assn. Lumber Grade-Use Guide Pamphlet VII; 1943. Endorsed by the National Lumber Manufacturers Assn. Larch-Douglas Fir. For the purpose of acquainting the individual, who is not familiar with Larch-Douglas Fir, with its standard grades and sizes, and to recommend the proper grades of the wood for specific uses. Lists the recommended grades for building construction and other uses, shows a table giving standard manufactured sizes, gives unretouched photographic reproductions of each grade, and describes the grades.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1942. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; rules for grading white fir; rules for grading Larch-Douglas fir; rules for grading Douglas fir railroad car material; and standard specifications and working stresses for structural grades of Douglas fir structural joists, plant, posts, and timbers.

References.—American Lumber Standards, nomenclature and basic grading rules, *see* 400.0, 400.20.

400.24 Hemlock Grading Rules

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Hemlock; Western. Covers definition, constants, properties, occurrence, grades and forms available, and uses.

Northern Hemlock and Hardwood Manufacturers Assn. Lumber Grade-Use Guide Pamphlet VI; 1943. Endorsed by the National Lumber Manufacturers Assn. Eastern Hemlock, Tamarack, and Northern White Cedar. Presents information on the specification and use of shingles and posts for buildings and other structures. Lists a condensed lumber grade-use guide showing the items and grades in which these woods are manufactured and available and the uses for which their grades may be best employed, sizes of lumber and shingles, and a brief description of the quality of each standard grade and items available.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber (conforming to American Lumber Standards) and White Cedar Shingles, 1941. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards, description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, common boards and strips, dressed and matched, and shiplap, flooring, ceiling, partition, drop siding, bevel siding, dimension or piece stuff, lath, heavy joist, timbers, structural joists and rafters (eastern hemlock), white cedar shingles; and standard planing mill patterns for D and M., flooring, partition, ceiling, shiplap, drop siding, and Byrkit lath. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

West Coast Lumbermen's Assn. Lumber Grade-Use Guide Pamphlet IV; 1943. Endorsed by the National Lumber Manufacturers Assn. Douglas Fir, West Coast Hemlock, Western Red Cedar, and Sitka Spruce. Presents the grades for buildings and other structures and gives the uses for which these grades may be best employed. Lists a condensed lumber grade-use guide and lists the uses of the grades in building and other construction.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 12; 1943. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, and grading rules for West Coast hemlock.

References.—American Lumber Standards, nomenclature and basic grading rules, *see* 400.0, 400.20.

400.25 Larch and Tamarack Grading Rules

Northern Hemlock and Hardwood Manufacturers Assn. Lumber Grade-Use Guide Pamphlet VI; 1943. Endorsed by the National Lumber Manufacturers Assn. Eastern Hemlock, Tamarack, and Northern White Cedar. Presents information on the specification and use of shingles and posts for buildings and other structures. Lists a condensed lumber grade-use guide showing the items and grades in which these woods are manufactured and available and the uses for which their grades may be best employed, sizes of lumber and shingles, and a brief description of the quality of each standard grade and items available.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber (conforming to American Lumber Standards) and White Cedar Shingles, 1941. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards, description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, common boards and strips, dressed and matched, and shiplap, flooring, ceiling, partition, drop siding, bevel siding, dimension or piece stuff, lath, heavy joist, timbers, structural joists and rafters (eastern hemlock), white cedar shingles; and standard planing mill patterns for D and M., flooring, partition, ceiling, shiplap, drop siding, and Byrkit lath. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

Northern Pine Manufacturers Assn. Standard Grading Rules for Tamarack Lumber, 1939. Conforms to American

Lumber Standards and includes standard sizes for dressed lumber; standard size of rough lumber; general instructions of grading; sizes, measurements, and tally; inspection and shipping provisions; definitions of defects and blemishes; association standard grades for selects, bevel siding, boards, and strips, dimension and timbers, shop, and lath.

Western Pine Assn. Lumber Grade-Use Guide Pamphlet VII; 1943. Endorsed by the National Lumber Manufacturers Assn. Larch-Douglas Fir. For the purpose of acquainting the individual, who is not familiar with Larch-Douglas Fir, with its standard grades and sizes, and to recommend the proper grades of the wood for specific uses. Lists the recommended grades for building construction and other uses, shows a table giving standard manufactured sizes, gives unretouched photographic reproductions of each grade, and describes the grades.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1942. Includes official grade, trade, and species mark; general instructions, measurements, and tally; definitions of defects; reinspection; rules for grading Larch-Douglas fir; rules for grading Larch and Douglas fir railroad car material; and standard specifications and working stresses for structural grades of Larch structural joists, plank, posts, and timbers.

References.—American Lumber Standards, nomenclature and basic grading rules, *see* 400.0, 400.20.

400.26 Pine Grading Rules

Arkansas Soft Pine Bureau. 1939 Standard Specifications for Arkansas Soft Pine Lumber. Includes grading provisions for soft pine conforming to American Lumber Standards; lists defects, requirements for yard and industrial rough and dressed sizes; measurement and tally; moisture; inspection; and shipping.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Western White Pine (White Pine, Idaho White Pine). Covers definition, constants, derivation, uses, grades, packing, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. White Pine (Eastern White Pine, Northern White Pine, Northern Pine, Spruce Pine, Cork Pine, Soft Pine). Covers definition, constants, derivation, uses, grades, packing, and substitutes.

Northeastern Lumber Manufacturers Assn. Lumber Grade-Use Guide Pamphlet II; 1943. Endorsed by the National Lumber Manufacturers Assn. Northern White Pine and Eastern Spruce. Eastern spruce used for structural purposes, staging and scaffolding general millwork, and boxes and crates. Northern white pine used for doors, frames and other millwork, and the lower grades for construction purposes and boxes and crating. Lists the recommended grades for building purposes and other uses and tables giving the standard manufactured sizes.

Northeastern Lumber Manufacturers' Assn. Standard Grading Rules for Northern White Pine (Pinus Strobus—Northeastern Type) and Norway Pine (Pinus Resinosa—Northeastern Type), 1937. American Lumber Standards. Covers general instructions, yard and industrial size standards, standard sizes for dressed lumber, measurement, and tally; definitions of defects; inspection rules for B select and better, C select, C select and better, D select, D select and better, No.1 common, No.2 common, No.1 and 2 common, No.3 common, No.4 common, No.5 common, log run square edge, log run round edge, and round edge box sides.

Northern Hemlock and Hardwood Manufacturers Assn. Lumber Grade-Use Guide Pamphlet XVI; 1943. Northern White Pine, Norway Pine, and Eastern Spruce. Presents information on the specification and use for buildings and other structures. Lists a condensed lumber grade-use guide showing the standard grades of these three species best suited and usually employed in construction of different types and qualities, standard sizes of lumber, and a brief description of the quality of each standard grade and item available.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce (conforming to American Lumber Standards), 1941. Variations from American Lumber Standards are noted. Includes official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes, measurements, and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades; dimension and timber; structural joists and rafters of Norway pine; and lath.

Northern Pine Manufacturers Assn. Lumber Grade-Use Guide Pamphlet X; 1943. Endorsed by the National Lumber Manufacturers Assn. Northern White Pine, Norway Pine, Eastern Spruce, and Western White Spruce. Presents information on the specification and use for buildings and other structures. Lists a condensed lumber grade-use guide showing the standard grades of these species best suited and usually employed in the construction of different types and qualities, standard sizes of lumber, and a brief description of the quality of each standard grade and item available in these woods.

Northern Pine Manufacturers Assn. Standard Grading Rules for Northern White Pine, Norway Pine, and Jack Pine Lumber, 1939. Conforms to American Lumber Standards and includes standard sizes for dressed lumber; standard size of rough lumber; general instructions on grading; sizes, measurements, and tally; inspection and shipping provisions; definitions of defects and blemishes; association standard grades for selects, bevel siding, boards and strips, dimension and timbers, shop, and lath.

Southern Pine Assn. Lumber Grade-Use Guide Pamphlet IX; 1944. Endorsed by the National Lumber Manufacturers Assn. Longleaf Southern Pine and Shortleaf Southern Pine. Treats the several species, one of which is longleaf and the others shortleaf. Lists a lumber grade-use guide in condensed form for quick reference, tables indicating the standard sizes of lumber and timber, and a description of the quality of each standard grade in the various items for a better understanding of the grade-use guide.

Southern Pine Inspection Bureau of the Southern Pine Assn. The Gulf Coast Classification of Pitch Pine Resawn Lumber and Sawn Timber, 1923. Includes list of defects, general rules, flooring, boards and planks, deals, decking, scantling, dimension, kiln-dried saps, air-dried, saps, merchantable sawn timber, river plate standard, and West Indian.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions; definitions; general grading provisions; specifications for long leaf yellow pine and for short leaf yellow pine—dimension and small timbers, utility timbers and heavy joists, factory flooring, decking and heavy shiplap, structural lumber; stock sizes; and average weights of Southern pine worked to standard sizes.

Western Pine Assn. Lumber Grade-Use Guide Pamphlet VIII; 1943. Endorsed by the National Lumber Manufacturers Assn. Idaho (Genuine) White Pine. Gives information on its standard grades and sizes and specifications and use of certain grades recommended for specific purposes. Lists the recommended grades for building purposes and other uses, shows a table giving standard manufactured sizes, gives unretouched photographic illustrations of each yard grade, and describes the grades.

Western Pine Assn. Lumber Grade-Use Guide Pamphlet XI; 1943. Endorsed by the National Lumber Manufacturers Assn. Ponderosa Pine. For the purpose of acquainting the individual, who is not familiar with Ponderosa Pine, with its standard yard grades and sizes, and to recommend the proper grades of the wood for specific uses. Lists the recommended grades for building construction and other uses, shows a table giving standard manufactured sizes, gives unretouched photographic reproductions of each grade, and describes the grades.

Western Pine Assn. Lumber Grade-Use Guide Pamphlet XII; 1943. Endorsed by the National Lumber Manufacturers Assn. Sugar Pine (Genuine White Pine). Presents information on standard grades and sizes, and specifications and use of certain grades for specific purposes. Lists the recommended grades for building purposes and other uses, shows a table giving standard manufactured sizes, gives unretouched photographic reproductions of principal yard grades, and describes the grades.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Englemann Spruce, Incense Cedar and Red Cedar Lumber, 1942. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; grading rules for Ponderosa pine; grading rules for Idaho white pine; grading rules for sugar pine; and standard manufactured sizes.

References.—American Lumber Standards, nomenclature, and basic grading rules, *see* 400.0, 400.20.

400.27 Redwood Grading Rules

California Redwood Assn. Lumber Grade-Use Guide Pamphlet XIII; 1943. Endorsed by the National Lumber Manufacturers Assn. California Redwood. Presents information concerning uses, sizes, items, and standard grades. Lists the recommended grades for building purposes and other uses, tables giving the standard manufactured sizes for various working, description of the grades of yard stock, and character of grades and typical uses.

California Redwood Assn. Standard Specifications, 1942. General Instructions. Conforms to American Lumber Standards, except as herein specified. Gives definitions of standard defects; grading provisions; rough dry sizes, description, measurement, and tally; and inspection and shipping provisions.

California Redwood Assn. Standard Specifications, 1942. Redwood Grade Marks. Gives requirements for approved grade marks of lumber inspected by this association, diagrams, and explanatory notes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Redwood (California Redwood, Sequoia, Hembolt Redwood). Covers definition, constants, crushing strength, safe working stresses, derivation, uses, grading, marketing, and substitute.

References.—American Lumber Standards, nomenclature, and basic grading rules, *see* 400.0, 400.20.

400.28 Spruce Grading Rules

Northeastern Lumber Manufacturers Assn. Lumber Grade-Use Guide Pamphlet II; 1943. Endorsed by the National Lumber Manufacturers Assn. Northern White Pine and Eastern Spruce. Eastern spruce used for structural purposes, staging and scaffolding, general millwork, and boxes and crates. Northern white pine used for doors, frames and other millwork, and the lower grades for construction purposes and boxes and crating. Lists the recommended grades for building purposes and other uses and tables giving the standard manufactured sizes.

Northeastern Lumber Manufacturers' Assn. Standard Grading Rules for Eastern Spruce and Balsam Fir, 1938. Covers general instructions; yard and industrial size standards, measurement, and tally; inspection and shipping provisions; definitions of defects; inspection rules for B and Btr. (clear), C select (No. 1), selected merchantable (No. 2), No. 1 (merchantable), No. 2 (No. 4), and No. 3 (No. 5); and structural joist and plank.

Northern Hemlock and Hardwood Manufacturers Assn. Lumber Grade-Use Guide Pamphlet XVI; 1943. Northern White Pine, Norway Pine, and Eastern Spruce. Presents information on the specification and use for buildings and other structures. Lists a condensed lumber grade-use guide showing the standard grades of these three species best suited and usually employed in construction of different types and qualities, standard sizes of lumber, and a brief description of the quality of each standard grade and item available.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce (conforming to American Lumber Standards), 1941. Variations from American Lumber Standards are noted. Includes official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes, measurements, and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades; dimension and timbers; structural joists and rafters of Norway pine; and lath.

Northern Pine Manufacturers Assn. Lumber Grade-Use Guide Pamphlet X; 1943. Endorsed by the National Lumber Manufacturers Assn. Northern White Pine, Norway Pine, Eastern Spruce, and Western White Spruce. Presents information on the specification and use for buildings and other structures. Lists a condensed lumber grade-use guide showing the standard grades of these species best suited and usually employed in the construction of different types and qualities, standard sizes of lumber, and a brief description of the quality of each standard grade and item available in these woods.

Northern Pine Manufacturers Assn. Standard Grading Rules for Eastern Spruce and Western White Spruce Lumber, 1939. Conforms to American Lumber Standards and includes standard sizes for dressed lumber; standard size of rough lumber; general instructions on grading; sizes, measurements, and tally; inspection and shipping provisions; definitions of defects and blemishes; association standard grades for selects, bevel siding, boards and strips, dimension and timbers, shop, and lath.

West Coast Lumbermen's Assn. Lumber Grade-Use Guide Pamphlet IV; 1943. Endorsed by the National Lumber Manufacturers Assn. Douglas Fir, West Coast Hemlock, Western Red Cedar, and Sitka Spruce. Presents the grades for buildings and other structures and gives the uses for which these grades may be best employed. Lists a condensed lumber grade-use guide and lists the uses of the grades in building and other construction.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 12, 1943. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, and grading rules for Sitka spruce.

Western Pine Assn. Lumber Grade-Use Guide Pamphlet XIV; 1943. Endorsed by the National Lumber Manufacturers Assn. Engelmann Spruce. Contains information relative to the standard grades and sizes and specifications and use of grades recommended for specific purposes. Lists the recommended grades for building construction and other uses, shows unretouched photographic reproductions of examples of yard grades, gives a table of standard manufactured sizes for various working and a brief description of the standard grades.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1942. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and rules for grading Engelmann spruce.

U. S. Gov., Navy Dept. Specification 39S3d; 1936. Spruce (Aircraft Use).

References.—American Lumber Standards, nomenclature, basic grading rules, *see* 400.0, 400.20.

400.29 Miscellaneous Softwood Grading Rules

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Balsa Wood, Covers definition, constants, general characteristics, derivation, uses, grades, packaging, and substitutes.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern Hardwood and Softwood Logs, Tie Cuts, Box Bolts, Shingle Bolts, Chemical Logs, Bolts and Cordwood, 1943. Gives general instructions, association log inspection service, grading rules, log scaling principles, and detail requirements for hardwood logs, aspen and softwood logs, tie cuts, box bolts, shingle bolts, chemical logs, chemical bolts, and chemical cordwood.

U. S. Gov., Navy Dept. Specification 39B5b; 1944. Balsa (Ochroma).

400.3 HARDWOOD GRADING RULES

400.30 General Items

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Lumber; Hardwood. Covers definition, classification, standard grades, uses, method of producing, purchasing practices, packing, marketing, and substitutes.

National Hardwood Lumber Assn. Rules for the Measurement and Inspection of Hardwood Lumber, Cypress, Veneers, and Thin Lumber, 1944. Includes regulations for inspection, general instructions for inspection, standard grades, standard inspection, and special inspection for hardwoods for wagon stock, construction work, and ties; tally, measurement, grades, and inspection of cypress; rules for measurement and cutting and classified grades of veneer, thin lumber, and plywood veneers; national hardwood lumber sales code; and facsimile of bonded certificate. Veneer, thin lumber, and plywood portion endorsed by the Veneer Association.

National Hardwood Lumber Assn. Standard Specifications for Structural Stress-Grades of Hardwoods and Cypress Joist and Plank, Beams and Stringers, Posts and Timbers, 1941. Includes inspection regulations, general grading specifications, and definitions of terms. Conforms to the Recommendations and Standards of the American Railway Engineering Assn., American Society for Testing Materials, and American Lumber Standards.

National Lumber Manufacturers Assn. Lumber Grade-Use Guide Pamphlet XV; 1943. Hardwood Lumber and Timber for Building and Other Structures. Covers choice of hardwoods, properties of hardwoods, hardness, ability to stay in place, color, grain and texture, finishing, classification and specification, stock millwork, various flooring, interior trim and molding, stair treads and risers, solid hardwood wall paneling, special millwork and cabinet work, specification of veneers and plywood, table giving data on veneer woods, hardwood lumber for building exteriors, hardwoods for structural parts of buildings and other structures, sizes of special use construction grades, choice of hardwood for structural parts, and recommended structural grades of hardwoods for various uses.

400.31 Basswood Grading Rules

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Poles; Western Red Cedar. Covers definition, types and grades, properties, preservative treatment, and substitutes.

400.32 Birch Grading Rules

400.33 Gum Grading Rules

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Gum Wood (Sweet Gum, Red Gum, Sap Gum, Satin Walnut, Hazel Pine). Covers definition, constants, general properties, derivation, uses, grades, and substitutes.

400.34 Hickory Grading Rules

U. S. Gov., Navy Dept. Specification 39H3; 1928. Hickory Butts.

400.35 Mahogany Grading Rules

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Mahogany. Covers definition, constants, derivation, uses, grades, shipment, and substitutes.

400.36 Maple Grading Rules

U.S. Gov., U.S. Army, Army Air Forces. Specification 82-1B; 1938. Lumber; Maple.

400.37 Oak Grading Rules

U.S. Gov., Army Air Forces. Specification 15069-A (1); 1943. Lumber; Oak.

U. S. Gov., Navy Dept. Specification 3905e; 1928. Oak; White (Ship Use).

U. S. Gov., Navy Dept. Specification 3906b; 1938. Oak; White, Bending.

400.38 Walnut Grading Rules

American Walnut Manufacturers Assn. Logging American Walnut, undated. Compilation for the selection of merchantable timber, trees which should not be cut, for felling tree and cutting into logs, for piling of logs, and defects in logs.

American Walnut Manufacturers Assn. Rules for Grading American (Black) Walnut Logs, 1940. Specifications for inspection of prime, select, No.2, and cull logs; gives diameter and length requirements and classes of defects. Also includes walnut stumps, in three grades, size and number of pieces in each stump, and intensity of figure.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 82-11B; 1942. Wood; Black Walnut, for Small Arms.

400.39 Grading Rules for Other Hardwoods

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Lignum Vitae. Covers definition, constants, derivation, uses, forms and grades, containers, and substitutes.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern Hardwood and Softwood Logs, Tie Cuts, Box Bolts, Shingle Bolts, Chemical Logs, Bolts and Cordwood, 1943. Gives general instructions, association log inspection service, grading rules, log scaling principles, and detail requirements for hardwood logs, aspen and softwood logs, tie cuts, box bolts, shingle bolts, chemical logs, chemical bolts, and chemical cordwood.

Northern Pine Manufacturers Assn. Standard Grading Rules for Aspen Lumber, 1939. Rules for the Inspection of Aspen Lumber. Conforms to American Lumber Standards and includes standard sizes for dressed lumber; standard size of rough lumber; general instructions on grading, sizes, measurements, and tally; inspection and shipping provisions; definitions of defects and blemishes; association standard grades for selects, bevel siding, boards and strips, dimension and timbers, shop, and lath.

U. S. Gov., Navy Dept. Specification 39A2; 1929. Ash; White (Aircraft Use).

U.S. Gov., U. S. Army, Army Air Forces. Specification 82-3C; 1935. Lumber; Ash, White, for Aircraft Use.

400.4 PRESERVATIVE TREATMENT FOR WOOD

400.40 Definitions and Standards Relating to Wood Preservation

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Preservative Treatment of Wood. Includes table of quantities of creosote for various classes of wood.

American Society for Testing Materials, D 324-41; 1941. Definitions of Terms Relating to Timber Preservatives. Defines coal tar, coke-oven tar, creosote, creosote-coal tar solution, creosote-distillate, creosote oil, gas-house coal tar, and water-gas tar.

American Wood-Preservers' Assn., 2d; 1942. Standard Recommendations for the Purchase and Preservation of Forest Products. Gives general requirements, treatment, results of treatment, preservatives, inspection, and care after treatment.

American Wood-Preservers' Assn., 20c; 1944. Standard Methods for Determining Penetration of Salt Preservatives. Gives method of determining penetration of zinc chloride or chromated zinc chloride, method of determining penetration of Tanalith, and method for determining penetration of zinc meta arsenite.

American Wood-Preservers' Assn., 33b; 1926. Standard Instructions for the Inspection of Preservative Treatment of Wood. Covers full-cell processes for oil treatment, salt treatment, and oil-salt treatment; empty-cell process for oil treatment; and methods for checking measuring devices in use to measure absorption, obtaining cubical contents of treating cylinder, determining average depth of penetration, and taking inventory.

American Wood-Preservers' Assn., 47a; 1932. Glossary of Terms Used in Wood Preservation. Gives definitions of approximately 200 words and terms relative to wood preservation.

American Wood-Preservers' Assn., 50d; 1944. Recommended Practice for the Use of Pressure Treated Lumber in Protecting Buildings Against Decay and Termites. For protection against decay and against subterranean termites and dry-wood termites. Designates construction in contact with the ground and construction not in contact with the ground. Gives minimum retention (lb.-cu. ft.) required for various kinds of preservatives.

U. S. Gov., Federal Specification TT-W-571b; 1941. Amendment 1; 1944. Wood-Preservative; Recommended Treating Practice. Requires current standard specifications of the American Wood Preservers' Assn. for preservative treatment shall be used and gives tables showing proper specification to be used in the treatment of various products from different species of wood covering both preservative oils and preservative salts; and methods of sampling, inspection, and tests.

400.41 Preservative Solutions for Wood

National Door Manufacturers Assn. Millwork Preservatives, 1938. Gives minimum requirements for nonaqueous solution, physical properties, and toxic strength tests. Also to be relatively insoluble in water, nonstaining after volatility test, and have satisfactory depth of penetration.

References.—Creosote, zinc chloride, *see* 801.3, 839.38.

400.42 Pressure Process of Wood Preservations

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for preservative treatments for timber—requirements for types of treatments; composition and analyses of materials (creosote oil, creosote-coal-tar solution, creosote-petroleum solution, zinc chloride, sodium fluoride-arsenate dinitrophenol solution, chromated zinc chloride, and zinc meta arsenite), sampling and testing (to conform to American Society for Testing Materials specifications), preparation for treatment, amount of preservative, and pressure treatment processes.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Preservative Treatment of Pacific Coast Douglas Fir. Gives general requirements; and requirements for salt and oil treatments, empty-cell Lowry and Rueping process, full-cell Burnet process, full-cell Bethel process, results of treatment, inspection, and re-treatment.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Treating Processes. Gives general requirements, and requirements for salt and oil treatments, empty-cell Lowry and Rueping process, full-cell Bethel process, and zinc chloride and creosote Cord process.

American Society for Testing Materials, D 52-20; 1920. Wooden Paving Blocks for Exposed Pavements. Describes woods to be treated, quality of timber, size of blocks, coal-tar pitch or other preservative, process of treating wood with preservative, and penetration of sapwood.

American Transit Assn. Recommended Specification for Preservative Treatment of Structural Timber and Cross Ties, W139-31; 1931. Describes the treatment of timber and cross ties by various methods.

American Transit Assn. Standard Specification for Pressure Treatment of Pine Poles, W49-31; 1931. Covers treatment of pine poles for electric railway purposes. It includes requirements for preparation and equipment, absorption and penetration, and treating operations.

American Wood-Preservers' Assn., 34b; 1926. Standard Specification for the Preservative Treatment of Ties by Pressure Processes. For ties, exclusive of Douglas fir, larch or tamarack. Gives requirements for seasoning, preparation for treatment, manner of treatment, retention of preservative, determination of penetration, plant equipment, oil treatment, salt treatment, and oil-salt treatment.

American Wood-Preservers' Assn., 35c; 1929. Standard Specifications for the Preservative Treatment of Timber and Lumber by Pressure Processes. For woods, except Douglas fir, larch or tamarack. Gives requirements for seasoning, preparation for treatment, manner of treatment, retention of preservative, determination of penetration, plant equipment, oil treatment, salt treatment, and oil-salt treatment.

American Wood-Preservers' Assn., 36e; 1944. Standard Specification for the Preservative Treatment of Southern Pine Poles by Pressure Processes. Gives general requirements, treatment, standard processes, results of treatment, preservatives, inspection, and re-treatment.

American Wood-Preservers' Assn., 37d; 1942. Standard Specification for the Preservative Treatment of Round Pine Posts by Pressure Processes. Gives general requirements, treatment, results of treatment, preservatives, inspection, and re-treatment.

American Wood-Preservers' Assn., 38b; 1942. Standard Specification for the Preservative Treatment of Pacific Coast Douglas Fir Ties and Lumber by Pressure Processes. Gives general requirements, treatment, results of treatment, preservatives, inspection, and re-treatment.

American Wood-Preservers' Assn., 39c; 1944. Standard Specification for the Preservative Treatment of Southern Pine Piles by Pressure Processes. Gives general requirements, treatment, results of treatment, preservatives, inspection, and re-treatment.

American Wood-Preservers' Assn., 41b; 1942. Standard Specification for the Preservative Treatment of Pacific Coast Douglas Fir Piles by Pressure Processes. Gives general requirements, treatment, results of treatment, preservatives, inspection, and re-treatment.

American Wood-Preservers' Assn., 51a; 1942. Standard Specification for the Preservative Treatment of Pacific Coast Douglas Fir Poles by Pressure Processes. Gives general requirements, treatment, results of treatment, preservatives, inspection, and re-treatment.

American Wood-Preservers' Assn., 54c; 1944. Standard Specification for the Preservative Treatment of Jack Pine Poles by Pressure Processes. Gives general requirements, treatment, results of treatment, preservatives, inspection, and re-treatment.

American Wood-Preservers' Assn., 55c; 1944. Standard Specification for the Preservative Treatment of Red Pine Poles by Pressure Processes. Gives general requirements, treatment, results of treatment, preservatives, inspection, and re-treatment.

American Wood-Preservers' Assn., 56c; 1944. Standard Specification for the Preservative Treatment of

Lodgepole Pine Poles by Pressure Processes. Gives general requirements, treatment, results of treatment, preservatives, inspection, and re-treatment.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, Specification 140-39; 1939. Preservative Treatment of Capping and Grooved Trunking. Creosote treatment of wood conduit for railway signal purposes, using A.R.E.A. grade 1, creosote oil. Equipment of plants, Reuping, Lowry, full-cell process, penetration, etc.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-7; 1938. Specification for the Butt Treatment of Cedar Poles. Covers creosote treatment process for western red, and northern white cedar poles, with A.R.E.A. grade one S-4 creosote. Preparation for treatment, incising, minimum length of treated section based on length of pole, treatment, impregnation determination and marking.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-25; 1928. Pressure Treatment of Pine Poles. Includes southern, western, Norway, jack, and lodgepole pine poles; requirements for creosote A.R.E.A. grade one, preparation of poles for treatment, seasoning, treatment procedures for full-cell and empty-cell processes, penetration, and retention of preservatives.

References.—Lumber suitable for treatment, *see* 404.0; definitions, preparatory treatment of wood, *see* 400.40; creosote, zinc chloride, *see* 801.3, 839.38.

400.43 Brush and Open Tank Treatment for Wood Preservation

American Transit Assn. Recommended Specification for Preservative Treatment of Structural Timber and Cross Ties, W139-31; 1931. Describes the treatment of timber and cross ties by various methods.

American Transit Assn. Standard Specification for Brush Treatment of Wood Poles, W51-31; 1931. Discusses brush treatment of poles in various stages of usage.

American Transit Assn. Standard Specification for Non-Pressure (Open Tank, Brush and Spray) Treatments for Structural Timber and Ties, W50-31; 1931. Gives detailed requirements as to the method of treatment by open tank, brush, and spray of structural timber and ties.

American Transit Assn. Standard Specification for Open Tank Butt Treatment of Poles (Plain and Incised), W48-30; 1930. This specification covers the treatment of poles by immersion of the butt ends in preservative oils contained in open tanks. It refers also to the preparation for treatment, preservative, treating operations, and inspection of the material.

American Wood-Preservers' Assn., 43c; 1941. Standard Specification for the Preservative Treatment of Pole Butts by the Non-Pressure Process—Incising Method. Gives requirements for seasoning, shaving, incising, classification, preservative oils, plant equipment, length of treated sections, hot and cold baths, penetration, handling, storing, inspection, and sampling.

Western Red and Northern White Cedar Assn. Specifications for the Preservative Treatment of Western Red Cedar and Northern White Cedar Poles, 1940. For three methods of treatment in creosote, a continuous submersion in hot creosote for 15 min., a process using alternately submersion in hot and cold creosote for 6 hr., and a guaranteed penetration treatment, procedure and temperature of preservative for each method, and creosote according to American Wood Preservers' Assn. specifications.

U.S. Gov., Federal Specification TT-W-571b; 1941. Wood-Preservative; Recommended Treating Practice. Requires current standard specifications of the American Wood Preservers' Assn. for preservative treatment be used, and gives schedule of recommended practice in the preservative treatment of timber in various forms. Emergency Alternate Federal Specification E-TT-W-571b; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) states that the following Federal specifications form a part of this specification: TT-W-531, TT-W-560, TT-W-566a, TT-W-576a, TT-W-581, E-TT-W-546, E-TT-W-551, E-TT-W-556a, E-TT-W-568, and E-TT-W-573.

References.—Definitions, preparatory treatment of wood, *see* 400.40; creosote, zinc chloride, *see* 801.3, 839.38.

400.49 Miscellaneous Specifications for Wood Preservative Treatment

American Wood-Preservers' Assn., 48b; 1941. Standard Instructions for Field Treatment of Creosoted Timber and Piles. It is recommended that insofar as practicable, treated timbers and piles shall be framed and bored before treatment and field work of this character limited to a minimum. Gives instructions for handling treated timber and piles and for treating where field cutting or boring is necessary.

U. S. Gov., Navy Dept. Specification 51C40; 1944. Chemicals; Fire-Retardant, for Lumber and Timber (Recommended Treating Practice).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-2202-A; 1944. Moisture- and Fungus-Resistant Treatment of Signal Corps Ground Signal Equipment (Overall Treatment of Assembled Equipment).

400.5 WOOD PULP

400.50 General Items

Associated Factory Mutual Fire Insurance Companies. Pamphlet No.52; 1933. Pulpwood Storage, Fire Prevention and Protection, Fire-Fighting Methods. Covers recommendations in brief, storage, fire record, prevention of fire, size and separation of piles, protection of piles, and extinguishing a pulpwood fire.

Certified Pulp Testers' Bureau. American Paper and Pulp Assn., Assn. of American Wood Pulp Importers, and Technical Assn. of the Pulp and Paper Industry, joint sponsors. Official Rules for Weighing, Sampling, and Testing Wood Pulp for Moisture and Trade Practices for Certified Pulp Testers, 1939. Covers baled pulp, roll pulp, loose lap pulp, and double press wet machine pulp in sheets; location and quantity lots; determination of wet weight; sampling by strip; boring, and wedge methods; weighing, drying, and computation of air-dry weight; moisture test of baled shredded pulp; trade practices for certified pulp testers; and suggested forms of certificates. Approved by the National Assn. of Waste Material Dealers, Inc.

Technical Assn. of the Pulp and Paper Industry. Water Solubility of Wood, Standard T 1 m-41; 1941. Covers apparatus, specimen, procedure, and report for bath cold-water solubility and hot-water solubility.

Technical Assn. of the Pulp and Paper Industry. Methoxyl Groups in Wood, Standard T 2 m-43; 1943. Covers apparatus, reagents, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Moisture in Wood Chips and Sawdust by Toluene Method, Standard T 3 m-44; 1944. Covers apparatus required, reagent, test specimen, and procedure for testing.

Technical Assn. of the Pulp and Paper Industry. One Per Cent Caustic Soda Solubility of Wood, Standard T 4 m-44; 1944. Method of determining resistance of wood to solution by hot dilute alkali. Detects fungus decay from composite average samples. Lists apparatus required, preparation of solution, and method of procedure.

Technical Assn. of the Pulp and Paper Industry. Ether Solubility of Wood, Standard T 5 m-41; 1941. For measurement of waxes, fats, resins, and similar materials in wood. Covers apparatus required, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Alcohol-Benzene Solubility of Wood, Standard T 6 m-41; 1941. For measurement of waxes, fats, resins, and certain other ether-insoluble components of wood, including some wood gums. Covers apparatus required, reagent, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Laboratory Process of Pulp (Beater Method), Standard T 200 m-43; 1943. Concerns the processing of pulp by means of a laboratory standard beater prior to forming handsheets for the purpose of determining its behavior when subjected to a definite beating schedule. Covers apparatus, care of beater, sampling, storage of pulp samples, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Isolation of Cellulose by Chlorination Method, Standard T 201 m-37; 1937. Covers apparatus required, solutions, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Chlorine Consumption of Pulp, Standard T 202 m-42; 1942. Chlorination method that may be applied to unbleached sulphite, sulphate, and soda pulps. Covers apparatus, reagents, test specimen, procedure, report, and precision.

Technical Assn. of the Pulp and Paper Industry. Alpha Cellulose in Pulp, Standard T 203 m-40; 1940. For routine test determinations of alpha cellulose in paper-making fiber. Covers test specimen, procedure, modification for unbleached pulps, report, and precision.

Technical Assn. of the Pulp and Paper Industry. Pitch in Wood Pulp, Standard T 204 m-35; 1935. Gives requirements for preparation of sample, solution in sulphuric ether, and in ethyl alcohol for determination of pitch.

Technical Assn. of the Pulp and Paper Industry. Forming Handsheets for Physical Tests of Pulp, Standard T 205 m-40; 1940. For precision method of forming test sheets from pulp and of testing for physical properties. Covers apparatus, sampling, storage of pulp samples, test specimen, procedure, and appendices.

Technical Assn. of the Pulp and Paper Industry. Cuprammonium Disperse Viscosity of Pulp, Standard T 206 m-44; 1944. For routine test applicable to bleached and unbleached chemical pulps and to rag stock. Apparatus and reagent required, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Water Solubility of Pulp, Standard T 207 m-41; 1941. Covers apparatus, specimen, and procedure for cold-water and hot-water solubility methods of determining the amount soluble.

Technical Assn. of the Pulp and Paper Industry. Moisture in Pulp by Toluene Method, Standard T 208 m-34; 1934. For rapid laboratory sampling, including ground wood pulp, but not for large pulp shipments. Gives apparatus required, reagent, specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Methoxyl Groups in Pulp, Standard T 209 m-43; 1943. Covers apparatus, reagents, test specimen, procedure, and additional information.

Technical Assn. of the Pulp and Paper Industry. Weighing, Sampling, and Testing Wood Pulp for Moisture, Standard T 210 m-36; 1936. Gives methods for baled pulp, dried sheets, roll pulp, loose lap pulp, and double-press wet-machine pulp in sheets. Apparatus required, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Ash in Pulp, Standard T 211 m-44; 1944. Covers apparatus required, test specimen, and method of procedure.

Technical Assn. of the Pulp and Paper Industry. One Per Cent Caustic Soda Solubility of Pulp, Standard T 212 m-44; 1944. Method of determining resistance of pulp sample to solution by hot dilute alkali. Control test for cooking or bleaching process. Apparatus and caustic soda solution, test sample, and procedure.

Technical Assn. of the Pulp and Paper Industry. Dirt in Pulp, Tentative Standard T 213 m-43; 1943. Definition as pertains to paper, apparatus required, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Permanganate Number of Pulp, Tentative Standard T 214 m-42; 1942. For relative hardness or bleachability of pulp. Special apparatus required, reagents, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Copper Number of Pulp, Tentative Standard T 215 m-42; 1942. Mainly for evaluation of pulps free from unbleached, ground wood, or other highly lignified fibers. Gives apparatus and reagents required, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Spectral Reflectivity and Color of Pulp, Standard T 216 m-42; 1942. For method of measuring reflectivity relative to magnesium oxide. Apparatus and reflection standards required, illumination and viewing, calibration, and procedure.

Technical Assn. of the Pulp and Paper Industry. Brightness in Pulp, Suggested Method T 217 sm-42; 1942. Brightness, as applied to white and near-white papers, has come to be associated with the numerical value of the reflectance of these papers to light. Covers apparatus, calibration, test specimens, procedure, report, and appendices.

Technical Assn. of the Pulp and Paper Industry. Forming Handsheets for Optical Tests of Pulps, Tentative Standard T 218 m-42; 1942. For all unbleached and bleached pulps, provided that they have been so processed in manufacture that the individual fibrous elements have become separated. Covers apparatus, sampling, storage of pulp samples, test specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Bleach Requirements of Pulp, Tentative Standard T 219 m-42; 1942. To determine directly the amount of calcium hypochlorite bleaching agent necessary to bring a pulp to a selected standard degree of brightness. Covers apparatus, reagent, test specimen, procedure, report, precision, and additional information.

Technical Assn. of the Pulp and Paper Industry. Physical Testing of Pulp Handsheets, Tentative Standard T 220 m-42; 1942. For testing handsheets for strength and other physical properties, excepting optical properties. Covers basis weight, thickness, tensile strength and stretch, bursting strength, tearing strength, moisture, other tests, report, and precision.

Technical Assn. of the Pulp and Paper Industry. Drainage Time and Drainage Factor of Pulp, Tentative Standard T 221 m-42; 1942. For determining numerically a measure of the slowness of stock and is better suited for ground wood or beaten stock. Covers apparatus, calibration, procedure, and report.

Technical Assn. of the Pulp and Paper Industry. Lignin in Wood Pulp, Tentative Standard T 222 m-43; 1943. When wood pulp is treated with strong acids the carbohydrates are hydrolized, leaving an insoluble residue which is determined as lignin. Covers apparatus, reagents, test specimen, procedure, and report.

Technical Assn. of the Pulp and Paper Industry. Pentosans in Pulp, Tentative Standard T 223 m-43; 1943. For use in connection with determining furfural in typical chemical wood fibers. Covers apparatus, reagents, test specimen, procedure, calculations of results, and report.

Technical Assn. of the Pulp and Paper Industry. Laboratory Processing of Pulp (Ball-Mill Method), Suggested Method T 224 sm-43; 1943. Concerns the processing of pulp prior to forming handsheets for the purpose of determining its behavior when subjected to a definite beating schedule. Covers apparatus, sampling, storage of pulp samples, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Laboratory Processing of Pulp (Kollergang Method), Suggested Method T 225 sm-43; 1943. Concerns the processing of pulp prior to forming handsheets for the purpose of determining its behavior when subjected to a definite beating schedule. Covers apparatus, calibration, sampling, storage of pulp samples, test specimen, procedure, report, precision, and additional information.

Technical Assn. of the Pulp and Paper Industry. Specific External Surface of Pulp, Suggested Method T 226 sm-43; 1943. For determining the specific surface of chemical pulps, ground wood, woodflour, and similar materials. Covers apparatus, reagents, test specimen, procedure, report, precision, and additional information.

Technical Assn. of the Pulp and Paper Industry. Fineness of Pulp, Standard T 227 m-43; 1943.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-100A; 1943. Cellulose; Wood-Pulp.

400.6 SAWDUST

U.S. Gov., Army Air Forces. Specification 15059; 1936. Sawdust; Softwood and Hardwood.

400.7 ANALYSIS OF WOOD

Technical Assn. of the Pulp and Paper Industry. Holocellulose in Wood, Standard T 9 m-41; 1941. Holocellulose is a white lignin—free fibrous material composed of the hemicellulose and the cellulose in wood. Covers apparatus, reagents, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Sampling and Preparing Wood for Analysis, Tentative Standard T 11 m-42; 1942. For the preparation of wood samples for all chemical tests except the determination of cellulose. Covers sampling, grinding and screening, and additional information.

Technical Assn. of the Pulp and Paper Industry. Preparation of Extractive—Free Wood, Tentative Standard T 12 m-42; 1942. For all North American woods and may be applied to bark, straw, and similar fibrous materials and to pulps. Covers apparatus, reagents, specimen, and procedure.

Technical Assn. of the Pulp and Paper Industry. Lignin in Wood, Tentative Standard T 13 m-43; 1943. When wood is treated with strong acids the carbohydrates are hydrolized, leaving an insoluble residue which is determined as lignin. Covers apparatus, reagents, test specimen, procedure, and report.

401. RAW AND HEWN TIMBERS

401.1 RAILROAD TIES

401.10 General Items

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Ties. Specifications for cross ties, application of the specifications for cross ties, marking ties to indicate size acceptance, specifications for machining cross ties, specifications for switch ties, dimensions of ties, economic comparison of cross ties of different materials, methods and practices for proper seasoning of ties, care of ties, and marking for service records.

American Railway Engineering Assn., joint sponsor with U.S. Forest Service. Approved by American Standards Assn. as 03-1926. Railroad Ties. For cross ties and switch ties, acceptable kinds of wood, requirements on general qualities, resistance to wear, dimensions of standard sizes, permissable defects, classification into groups which may be used untreated and groups which require treatment.

American Transit Assn. Standard Specification for Cross Ties, W26-26; 1926. Specifies kinds of wood, physical requirements of wood, dimensions of ties, manufacture, inspection, and delivery. This specification is identical with the American Standard for Switch Ties, 03-1926, approved by the American Standards Assn.

American Transit Assn. Standard Specification for Switch Ties, W27-26; 1926. Specifies kinds of wood, physical requirements of wood, dimensions of ties, manufacture, inspection, and delivery. This specification is identical with the American Standard for Switch Ties, 03-1926.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for kinds of wood, general quality, resistances to wear and decay, dimensions, manufacture, inspection, delivery, and shipment.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for kinds of wood, general quality, resistances to wear and decay, dimensions, manufacture, inspection, delivery, and shipment.

U. S. Federal Specification MM-T-371; 1937. Ties, Wood; Cross and Switch. Covers two types—(I) cross and (II) switch; four forms—(A) sawed—top, bottom, and sides; (B) sawed—top and bottom; (C) hewed—top, bottom, and sides; and (D) hewed—top and bottom; and two classes—(U) untreated and (T) treated. Gives requirements for material, workmanship, dimensions, rate of growth, defects, ties to be used untreated, ties to be used treated, and preservative treatment; methods of inspection, sampling, and tests; and requirements for marking.

401.11 Cedar Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Cedar, Cross Ties, and Switch Ties. Physical requirements, design, manufacture, inspection, delivery, and shipment.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for cedar ties.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for cedar ties.

References.—Preservative Treatment, *see* 400.42.

401.12 Chestnut Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Chestnut Cross Ties and Switch Ties. Physical requirements, design, manufacture, inspection, delivery, and shipment.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for chestnut ties.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for chestnut ties.

References.—Preservative treatment, *see* 400.42.

401.13 Cypress Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Cypress Cross Ties and Switch Ties. Physical requirements, design, manufacture, inspection, delivery, and shipment.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for cypress ties.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for cypress ties.

References.—Preservative treatment, *see* 400.42.

401.14 Fir Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Fir Cross Ties and Switch Ties. Physical requirements, design, manufacture, inspection, delivery, and shipment.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for fir ties.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for fir ties.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, and grading rules for Douglas fir ties.

References.—Preservative treatment, *see* 400.42.

401.15 Oak Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Oak Cross Ties and Switch Ties. Physical requirements, design, manufacture, inspection, delivery, and shipment.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Crossties; Railroad. Covers definition, types (yellow pine, white oak, and mixed oak), occurrence, uses, weight, specifications, ordering instructions, and substitutes.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for oak ties.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for oak ties.

References.—Preservative treatment, *see* 400.42.

401.16 Pine Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Pine Cross Ties and Switch Ties. Physical requirements, design, manufacture, inspection, delivery, and shipment.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cross ties; Railroad.

Covers definition, types (yellow pine, white oak, and mixed oak), occurrence, uses, weight, specifications, ordering instructions, and substitutes.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for pine ties.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for pine ties.

References.—Preservative treatment, *see* 400.42.

401.17 Redwood Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Redwood Cross Ties and Switch Ties. Physical requirements, design, manufacture, inspection, delivery and shipment.

California Redwood Assn. Standard Specifications, 1942. No. 1 California Redwood Ties. Gives requirements for general quality of No. 1 split and sawn redwood ties, permissible sapwood, annual rings per inch, slope of grain, knots, splits, shakes, manufacture, size; and exceptions for small ties.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cross ties; Railroad (Redwood). Covers physical and mechanical properties, derivation, specifications, forms available, and substitutes.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for redwood ties.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for redwood ties.

References.—Preservative treatment, *see* 400.42.

401.18 Walnut Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Walnut Cross Ties and Switch Ties. Physical requirements, design, manufacture, inspection, delivery, and shipment.

Railway Tie Assn. Specifications for Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for walnut ties.

Railway Tie Assn. Specifications for Narrow Gage Cross Ties and Switch Ties. Adopted, 1940. Includes requirements for walnut ties.

References.—Preservative treatment, *see* 400.42.

401.19 Miscellaneous Ties

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Fundamentals To Be Considered in Designs of Substitute Ties. Must be designed so as to have sufficient strength to prevent failure of the tie or its fastenings. Gives performance, economy, fastenings, gage, line, surface, insulation, and causes of failure.

401.2 POSTS

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-746. Fences, Classes C and D; Wood Posts.

401.21 Cedar Posts

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads, Manual for Railway Engineering. Specifications for Standard Right-of-Way Fences, 1935. Covers cedar posts—sizes, depth of setting, and general requirements.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Fence Posts. Includes untreated cedar. Gives requirements for physical characteristics, design, manufacture, sizes, inspection, workmanship, delivery, and pressure treatment (A. R. E. A. Specifications).

Western Red and Northern White Cedar Assn. Western Red Cedar Posts, 1929. For split and round posts, standard sizes, minimum small end sizes, shapes for split posts, and permissible defects.

Western Red and Northern White Cedar Assn. Official Manufacturing Specifications Governing the Manufacture and Grading of Northern White Cedar Posts, 1933. For round and sawed posts, standard sizes, lengths, manufacture, insect damage, knots, short kinks, twists, cat faces, rot, crook or sweep, and methods of measuring sweep.

References.—Preservative treatment, *see* 400.42; fencing wood, *see* 402.2.

401.22 Chestnut Posts

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Standard Right-of-Way Fences, 1935. Covers chestnut post—sizes, depth of setting, and general requirement.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Fence Posts. Includes untreated chestnut. Gives requirements for physical characteristics, design, manufacture, sizes, inspection, workmanship, delivery, and pressure treatment (A. R. E. A. Specifications).

References.—Preservative treatment, *see* 400.42.

401.23 Cypress Posts

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Fence Posts. Includes untreated cypress. Gives requirements for physical characteristics, design, manufacture, sizes, inspection, workmanship, delivery, and pressure treatment (A. R. E. A. Specifications).

401.24 Locust Posts

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Fence Posts. Includes untreated black locust. Gives requirements for physical characteristics, design, manufacture, sizes, inspection, workmanship, delivery, and pressure treatment (A. R. E. A. Specifications).

References.—Preservative treatment, *see* 400.42.

401.25 Oak Posts

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Standard Right-of-Way Fences, 1935. Covers white oak posts—sizes, depth of setting, and general requirements.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specification for Wood Fence Posts. Includes treated red oak. Gives requirements for physical characteristics, design, manufacture, sizes, inspection, workmanship, delivery, and pressure treatment (A.R.E.A. Specifications).

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Fence Posts. Includes untreated white oak. Gives requirements for physical characteristics, design, manufacture, sizes, inspection, workmanship, delivery, and pressure treatment (A.R.E.A. Specifications).

References.—Preservative treatment, *see* 400.42.

401.26 Pine Posts

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Fence Posts. Includes treated sap yellow pine. Gives requirements for physical characteristics, design, manufacture, sizes, inspection, workmanship, delivery, and pressure treatment (A.R.E.A. Specifications).

401.29 Miscellaneous Specifications for Posts

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Standard Right-of-Way Fences, 1935. Covers cedar, locust, chestnut, Bois d'Arc, white oak, mulberry, and catalpa posts—sizes, depth of setting, and general requirements.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Fence Posts. Covers two classes—(1) untreated (black locust, cypress, catalpa, cedar, chestnut, Douglas fir, black walnut, heart yellow pine, larch, red mulberry, redwood, and white oak); and (T) treated (ash, beech, birch, black gum, cherry, elm, hickory, hackberry, maple, red oak, sap yellow pine, sycamore, and sap fir). Gives requirements for physical characteristics, design, manufacture, sizes, inspection, workmanship, delivery, and pressure treatment (A.R.E.A. Specifications).

California Redwood Assn. Standard Specifications, 1942. Split Posts, Stakes, Shakes, and Pickets. Conforms to American Lumber Standards. Gives requirements for No. 1 posts, split redwood grape stakes, No. 1 grape stakes, and split redwood pickets and shakes.

References.—Preservative treatment, *see* 400.42.

401.3 POLES, HEWN AND SAWN

401.30 General Items

American Transit Assn. Recommended Practice for Selection of Poles for Trolley Line Construction, D119-36; 1936. Describes method for selection and use of line poles for overhead construction, and method to be used in selecting proper poles when loading is known.

American Transit Assn. Recommended Specification for the Maintenance of Pole Timber and Structures, W140-30; 1930. This specification describes two methods of applying wood preservative treatment at the ground line section of standing poles, namely: Charring and spraying method and the hot spray or brush method. Detailed information is given furnishing the two methods used.

American Wood-Preservers' Assn., 14b; 1926. Standard Volumes of Piles and Poles. Table gives average volume per foot of length in cubic feet for diameters from 4 to 25 in. at large end and 4 to 15 in. at small end, and formula for estimating volume.

Assn. of American Railroads, Telegraph and Telephone Section, 1-E-1; 1939. Specification for the Replacement Inspection of Wood Poles in Railroad Communication Pole Lines. Prescribes basis for determining when poles, stubs, and braces in a line should be reinforced or replaced. Includes minimum pole circumference tables and defects to be corrected.

Telephone Group of American Standards Assn., sponsor. Approved by American Standards Assn. as O5a-1933. Ultimate Fiber Stresses of Wood Poles. Standard fiber stresses to be allowed in designing pole lines for Northern white cedar, Western red cedar, chestnut, and creosoted Southern yellow pine poles.

U. S. Gov., Dept. of Agriculture, Rural Electrification Administration. General Procedure Applying to Poles, Their Treatment, and Inspection, 1940.

U. S. Gov., Dept. of Agriculture, Rural Electrification Administration. Specifications for Poles and Pole Treatments. Covers general requirements, pressure-creosoted Douglas fir and Southern yellow pine poles, butt-treated white cedar and Western red cedar poles, creosoted anchor logs and pole keys, sampling and testing, treatment report instructions, and subcontracting.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airway. Specifications CAA-113. Poles; Wood, Treated.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H32; 1941. American Standards Assn., C2.2-1941. Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines. Comprising part 2 of the fifth edition, National Electrical Safety Code. Includes requirements for wood poles and cross arms.

401.31 Cedar Poles

American Transit Assn. Specification for Western Red Cedar Poles, D8-36; 1936. Gives material requirements, limits of knot sizes, dimensions, manufacturing requirements, and inspection of Western red cedar poles; includes also definitions of terms. These poles are classified in accordance with American Standards dimensions of Western red cedar poles approved by the American Standards Assn., 05c2-1931.

American Transit Assn. Specification for Wood Poles, D8-36; 1936. Gives material requirements, limits knot sizes, dimensions, manufacturing requirements, and inspection of Northern white cedar poles; includes also definitions of terms. These poles are classified in accordance with American Standard dimensions of Northern white cedar poles approved by the American Standards Assn., 05b2-1931.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-60; 1936. Round Western Cedar Poles. Includes definitions of terms, allowable and prohibited defects, sweep, trimming, framing, bark removal, and dimensions of 16- to 90-ft. poles.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-61; 1936. Northern White Cedar Poles. Includes definitions of terms, permissible and prohibited defects, sweeps, sawing, trimming, bark removal, storage and handling, and dimensions of 16- to 60-ft. poles.

Telephone Group of American Standards Assn., sponsor. Approved by American Standards Assn. as 05.1-1941. Specifications and Dimensions for Northern White Cedar Poles. Adopted by Western Red and Northern White Cedar Assn. Material requirements, dimensions, manufacturing requirements, definitions of terms, and diagram drawings of measurement of sweep and short crook.

Telephone Group of American Standards Assn., sponsor. Approved by American Standards Assn. as 05.2-1941. Adopted by Western Red and Northern White Cedar Assn. Specifications and Dimensions for Western Red Cedar Poles. Material requirements, dimensions, manufacturing requirements, definitions of terms, and diagram drawings of measurement of sweep and short crook.

Western Red and Northern White Cedar Assn. Manufacturing Specifications for Northern White Cedar Poles, 1936. For poles cut from live timber and 16 ft. or more in length; requirements on peeling and trimming; standard top measurements; permissible rot, crook, cat faces, knot, and twist, and standard weights.

U. S. Gov., Dept. of Agriculture, Rural Electrification Administration. Specifications for Poles and Pole Treatments. Covers general requirements, pressure-creosoted Douglas fir and Southern yellow pine poles, butt-treated white cedar and Western red cedar poles, creosoted anchor logs and pole keys, sampling and testing, treatment report instructions, and subcontracting.

References.—Preservative treatment, *see* 400.42, 400.43; fiber stress in poles, *see* 401.30; standard sizes, depth of setting, *see* 401.30.

401.32 Chestnut Poles

American Transit Assn. Specification for Chestnut Poles, D8-36; 1936. Gives material requirements, limits of knot sizes, dimensions, manufacturing requirements, and inspection of chestnut poles; includes also definitions of terms. These poles are classified in accordance with American Standard dimensions of chestnut poles 05.3, referred to below.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-62; 1936. Chestnut Poles. Requirements for supplying of chestnut poles such as permissible and prohibited defects, maximum sweep, offset, bark removal, squaring, trimming, and dimensions of 16- to 70-ft. poles.

Telephone Group of American Standards Assn., sponsor. Approved by American Standards Assn. as 05.3-1941. Specifications and Dimensions for Chestnut Poles. Material requirements, dimensions, manufacturing requirements, definitions of terms, and diagram drawings of measurements of sweep and short crook.

References.—Preservative treatments, *see* 400.42, 400.43; fiber stress in poles, *see* 401.30; standard sizes, dept. of setting, *see* 401.30.

401.33 Cypress Poles

401.34 Fir Poles

American Transit Assn. Specification for Douglas Fir Poles, D8-36; 1936. Gives material requirements, limits of knot sizes, dimensions, manufacturing requirements, and inspection of Douglas fir poles; includes also definitions of terms. These poles are classified in accordance with American Standard dimensions of Douglas fir poles 05.6, referred to below.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Poles, Creosoted Douglas Fir. Covers definition, occurrence, properties, treatment, and substitutes.

Telephone Group of American Standards Assn., sponsor. Approved by American Standards Assn. as 05.6-1941. Specifications and Dimensions for Douglas Fir Poles. Material requirements, dimensions, manufacturing requirements, storage and handling, definitions of terms, and diagram drawings of measurements of sweep and short crook.

West Coast Lumbermen's Assn., Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11, 1942. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, and grading rules for Douglas fir pole stock.

U. S. Gov., Dept. of Agriculture, Rural Electrification Administration. Specifications for Poles and Pole Treatments. Covers general requirements, pressure-creosoted Douglas fir and Southern yellow pine poles, butt-treated white cedar and Western red cedar poles, creosoted anchor logs and pole keys, sampling and testing, treatment report instructions, and subcontracting.

U. S. Gov., Navy Dept. Specification 39P11c; 1944. Poles and Sticks (for Spars and Shores).

401.35 Oak Poles

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf, and Miscellaneous. Poles; Sash. Gives requirements for oak sash pole chucked to fit sash pole hook and for bronze hook on handle of japanned or enameled steel tubing. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to save steel for handles and bronze for hooks.

401.36 Pine Poles

American Transit Assn. Specification for Lodgepole Pine Poles, D8-36; 1936. Gives material requirements, limits of knot sizes, dimensions, manufacturing requirements, and inspection of lodgepole pine poles; includes also definitions of terms. These poles are classified in accordance with American Standard dimensions of lodgepole pine poles 05.5, referred to below.

American Transit Assn. Specification for Southern Pine Poles, D8-36; 1936. Gives material requirements, limits of knot sizes, dimension, manufacturing requirements, and inspection of Southern pine poles; includes also definitions of terms. These poles are classified in accordance with American Standard dimensions of Southern pine poles approved by the American Standards Assn., 05.4.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-59; 1936. Southern Pine Poles Which Are To Be Given a Preservative Treatment. Includes Longleaf, Shortleaf, Loblolly, Slash and Pond pine poles; requirements as to permissible and prohibited defects, shape, bark removal, framing, gains, dimensions for poles 16- to 90-ft. long.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Poles; Creosoted Southern Pine. Covers definition, occurrence, grades, treatment, specification, and substitutes for pine poles.

Telephone Group of American Standards Assn., sponsor. Approved by American Standards Assn. as 05.4-1941. Specifications and Dimensions for Southern Pine Poles. Material requirements, dimensions, manufacturing requirements, storage and handling, definitions of terms, and diagram drawings of measurements of sweep and short crook.

Telephone Group of American Standards Assn., sponsor. Approved by American Standards Assn. as 05.5-1941. Specifications and Dimensions for Lodgepole Pine Poles. Material requirements, dimensions, manufacturing requirements, storage and handling definitions of terms, and diagram drawings of measurements of sweep and short crook.

U. S. Gov., Dept. of Agriculture, Rural Electrification Administration. Specifications for Poles and Pole Treatments. Covers general requirements, pressure-creosoted Douglas fir and Southern yellow pine poles, butt-treated white cedar and Western red cedar poles, creosoted anchor logs and pole keys, sampling and testing, treatment report instructions, and subcontracting.

References.—Preservative treatment, *see* 400.42, 400.43; fiber stresses in poles, *see* 401.30; standard sizes, depth of setting, *see* 401.30.

401.37 Redwood Poles

References.—*See* references under 401.36.

401.39 Miscellaneous Poles

U. S. Gov., Navy Dept. Specification 39P11c; 1944. Poles and Sticks (for Spars and Shores).

401.4 PILING, HEWN AND SAWN

401.40 General Items

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes requirements for sheet piles and bearing plates—materials, limitation of use, preparation for driving (excavation, caps, collars, pointing, splicing, and painting steel piles), methods of driving (general, hammer for timber and steel piles, hammer for concrete piles, additional equipment, leads, followers, and water jets), defective piles, determination of bearing piles (loading tests, timber piles, and concrete and steel piles), test piles, order lists for piling, storage and handling of timber piles, cutting off timber piles, measurement and payment, payment for test piles, and payment for loading piles.

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for timber piles—requirements for species, quality, and dimensions.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Driving Wood Piles. Gives requirements for tests, handling of material, selection and preparation of piles, types of hammers, driving, and framing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Piles. Gives requirements for kinds of wood, physical preperties, design, manufacture, inspection, delivery, and shipment.

American Society for Testing Materials, D 25-37; 1937. American Standards Assn. 06-1939. Round Timber Piles. Covers three grades of treated or untreated piles based on use classification; includes general quality of wood, allows sound knots, requirements for sound timber, tip, and butt; taper, sapwood, peeled piles (for grade A and B); diameters of Douglas fir, Southern pine, oak, cypress, chestnut, and cedar piles; straightness and lengths.

American Wood-Preservers' Assn., 14b; 1926. Standard Volumes of Piles and Poles. Table gives average volume per foot of length in cubic feet for diameters from 4 to 25 in. at large end and 4 to 15 in. at small end, and formula for estimating volume.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-387. Piling.

U. S. Gov., Navy Dept. Specification 39P14a; 1940. Piles; Wood.

References.—Pile drivers, *see* 741.1.

401.41 Cedar Piling

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Piles. Gives requirements for cedar piles for railway and highway bridges; physical properties, design, manufacture, inspection, delivery, and shipment.

Western Red and Northern White Cedar Assn. Specifications of Western Red Cedar Piling, 1932.

Requirements on production, standard lengths, sizes of butts and tops, and permissible sweep.

References.—Requirements for piles irrespective of specie, *see* 401.40; preservative treatment, *see* 400.42.

401.42 Chestnut Piling

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Piles. Gives requirements for chestnut piles for railway and highway bridges; physical properties, design, manufacture, inspection, delivery, and shipment.

References.—Requirements for piles irrespective of specie, *see* 401.40; preservative treatment, *see* 400.42.

401.43 Cypress Piling

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Piles. Gives requirements for cypress piles for railway and highway bridges; physical properties, design, manufacture, inspection, delivery, and shipment.

References.—Requirements for piles irrespective of specie, *see* 401.40; preservative treatment, *see* 400.42.

401.44 Fir Piling

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Piles. Gives requirements for Douglas fir piles for railway and highway bridges; physical preperties, design, manufacture, inspection, delivery, and shipment.

References.—Requirements for piles irrespective of specie, *see* 401.40; preservative treatment, *see* 400.42.

401.45 Oak Piling

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Piles. Gives requirements for oak piles for railway and highway bridges; physical properties, design, manufacture, inspection, delivery, and shipment.

References.—Requirements for piles irrespective of specie, *see* 401.40; preservative treatment, *see* 400.42.

401.46 Pine Piling

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Wood Piles. Gives requirements for Southern pine piles for railway and highway bridges; physical preperties, design, manufacture, inspection, delivery, and shipment.

U. S. Gov., The Panama Canal, Purchasing Dept. Specification for Piling, 1944. Southern yellow pine only, creosoted, for marine or salt-water use.

References.—Requirements for piles irrespective of specie, *see* 401.40; preservative treatment, *see* 400.42.

401.47 Redwood Piling

California Redwood Assn. Standard Specifications, 1942. Round Redwood Piling. Conforms to American Lumber Standards. Gives requirements for quality, taper, dimensions, etc.

References.—Requirements for piles irrespective of specie, *see* 401.40; preservative treatment, *see* 400.42.

401.49 Miscellaneous Specifications for Piling

American Public Works Assn. Sewers, J1-38; 1938. Includes wood piles, structural timber and lumber to conform with specifications of the American Assn. of State Highway Officials. Grading to meet provisions of American Lumber Standards. Defines limitations for uses of various species in sewer construction, methods of fencing, sheathing and shoring, temporary bridges, requirements for and depth of piling, equipment for driving piles, storage and handling of timber piles, and methods for determination of load bearing values.

References.—Requirement for piles irrespective of specie, *see* 401.40; preservative treatment, *see* 400.42.

401.5 SHIP'S KNEES

U. S. Gov., Navy Dept. Specification 39K2c; 1944. Knees; Boat and Ship.

401.6 CORDWOOD

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cordwood. Covers materials, definition of cord, actual measure, cutting, and specifications and standards.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern Hardwood and Softwood and Cordwood, 1943. Gives general instructions, association inspection service, grading rules, and detail requirements for chemical cordwood.

Technical Assn. of the Pulp and Paper Industry. Physical Evaluation of Pulp Cord-Wood, Tentative Standard T 7 p-36; 1936. A determination of the quality of wood per commercial unit of volume. Covers apparatus, test specimen, procedure, calculations, report, and precision for methods A and B.

401.9 MISCELLANEOUS SPECIFICATIONS FOR RAW AND HEWN TIMBERS

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-77; 1941. Creosoted Anchor Logs. For cedar and pine anchor logs for use in the communication plant. Gives general requirements, material and workmanship, marking, treatment, storage and handling, inspection, and warranty.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern Hardwood and Softwood Logs, Tie Cuts, Box Bolts, Shingle Bolts, Chemical Logs, Bolts, and Cordwood, 1943. Gives general instructions, association log inspection service, grading rules, log scaling principles, and detail requirements for hardwood logs, aspen and softwood logs, tie cuts, box bolts, shingle bolts, chemical logs, chemical bolts, and chemical cordwood.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, as revised July 15, 1941; FP-41. Treated and Untreated Timber.

U. S. Gov., Navy Dept. Specification 6B14b; 1943. Buoys; Anchor, Spar.

U. S. Gov., Navy Dept. Specification 39 L 2d; 1943. Lignum-Vitae.

402. ROUGH LUMBER

402.1 SAWN STAKES AND CROSS ARMS

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Part of this specification refers to material used in catenary construction, simple suspension, utilizing poles with pole spacing of not more than 150 ft. and for voltages not exceeding 1,200 volts. It includes requirements for pole bracket arms, feed clamp, crossings, catenary hanger, insulator pins, and pole brackets.

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Wood for crossarms referred to in this specification shall conform to the current specification D100 for Untreated Wood Crossarms (Material) of the Edison Electric Institute.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-28; 1941. Douglas Fir Crossarms. For standard and special crossarms for steel and wood pins. Gives design and dimensions, material requirements, definitions, finish and seasoning, storage, inspection and tests, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-29; 1929. Treated Southern Yellow Pine Crossarms. Requirements for standard crossarms for steel and for wood pins, and for special pole line spacing, including finish, number of annual rings, slant of grain, allowable sapwood, defects and warp, dimensional drawings, and method of preservative treatment using A.R.E.A. grade one creosote.

Edison Electric Institute. Suggestions for Specifications for Type A Untreated Douglas Fir Crossarms, TD-61; 1940. For crossarms from standard crossarm stock. Gives requirements for material, limited defects, prohibited defects, inspection, rejections, storage, definitions, and dimensional drawing.

Edison Electric Institute. Suggestions for Specifications for Type B Untreated Douglas Fir Crossarms, TD-62; 1940. For crossarms made of dense select structural grade. Gives requirements for material, limited defects, prohibited defects, inspection, rejection, storage, definitions, and dimensional drawing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Crossarms; Douglas Fir. Covers wood, two grades, specifications, substitutes, and uses.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture-content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir crossarm stock.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, National Electrical Safety Code, H32; 1941. American Standards Assn., C2.2-1941. Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines. For overhead lines, requirements on relative levels on pole of various classes of lines, on clearance between supporting structures and other objects, between wires and ground or rails, between crossing lines, between conductors of same line, climbing and working spaces, grades of construction, assumed loadings, strength requirements for various parts of line construction, requirements of insulators, tables of recommended normal sags of copper conductors, minimum permissible sags with tensions and stresses, etc. For crossarms of yellow pine or fir, permissible minimum cross-section dimensions.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-62-B; 1930. Crossarm; Wood, Telephone and Telegraph.

References.—Gage for bolt hole sizes in crossarms, *see* 615.82; grading rules for cypress, fir, pine, *see* 400.22, 400.23, 400.26; preservative treatment, *see* 400.4.

402.2 FENCING, GUARD RAILS, SCAFFOLDS, AND FALSE WORK

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Includes sizes, dimensions, and recommendations for fixed and portable wooden snow fences.

American Road Builders' Assn. Bulletin 53; 1938. Committee on Safe Highways—Report of Problem Committee on Guard Rail. Includes strength classifications, load resistance capacity for assembled guards, type classifications, panel lengths or post spacings, rail steel, rail strength, offset brackets and post rails, offset bracket test, end post attachment, rail joints, spring tensioning devices and their adjustments, end anchorage, intermediate anchorage and take-up, finish, post requirements for all type guards, recommendations for locations and positioning of guard rails, illustrations, and diagrammatic drawings.

Arkansas Soft Pine Bureau Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes square and flat wooden fence pickets, finish and standard dimensions.

California Redwood Assn. Standard Specifications, 1942. Battens, Pickets, Porch Rail and Other Millwork Items. Conforms to American Lumber standards. Gives requirements for grade A and better.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, as revised July 15, 1941; FP-41. Cattle Guards and Hub-High Wood Guardrail.

References.—Redwood grading rules, *see* 400.27; pickets and palings, *see* 423.5.

402.3 WOOD BLOCKS FOR PAVEMENTS AND FLOORS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Creosoted Wood Block Pavements; and Wood Block Floors. Gives requirements for grading; subgrade; curb; gutter; kind, quality, and sizes of blocks; methods of laying (mortar bed, bituminous paint coat, and bituminous mastic cushion methods); and guarantee.

American Society For Testing Materials, D 52-20; 1920. Wooden Paving Blocks for Exposed Pavements. Describes woods to be treated, quality of timber, size of blocks, coal-tar pitch or other preservative, process of treating wood with preservative, and penetration of sapwood.

American Wood-Preservers' Assn., 16b; 1923. Standard Specifications for Creosoted Wood Block Street Paving. Gives requirements for timber, size of blocks, preservatives, treatment, handling blocks after treatment, inspection, foundation, expansion joints, filling the joints, open joint construction, maintenance, bituminous filler, free carbon test, and melting point test.

American Wood-Preservers' Assn., 19b; 1923. Standard Specification for Interior Creosoted Wood Block Flooring. Gives timber, size of blocks, preservatives, treatment, handling blocks after treatment, inspection, sub-grade, foundation, laying the blocks, bituminous filler, and melting point test.

References.—Preservative treatments, *see* 400.4; road construction; *see* 516.1, 516.2, 516.3; bituminous fillers, *see* 505.15; sand filler, *see* 512.16.

402.4 YARD LUMBER

References.—American Lumber Standards for softwood yard lumber, *see* 400.0; other yard lumber, *see* 411; structural and factory lumber, *see* 412, 413.

402.41 Strips

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes strips, defects, nominal and dressed dimensions for four classes of yard and industrial lumber, moisture content and finish in conformity with American Lumber Standards.

California Redwood Assn. Standard Specifications, 1942. Strips. Conforms to American Lumber Standards. Gives requirements for rough and dressed sizes.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for strips.

References.—American Lumber Standards for softwood strips, *see* 400.0; grades for boards, *see* 402.42.

402.42 Boards

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes common boards, defects, nominal and dressed dimensions for four grades in conformity with American Lumber Standards, and gives moisture content requirements. Available in rough surfaced, shiplap, dressed and matched, beaded or V'd standard workings.

California Redwood Assn. Standard Specifications, 1942. Common Boards. Conforms to American Lumber Standards. Gives requirements for rough and dressed sizes.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for boards.

Southern Pine Inspection Bureau of the Southern Pine Assn. The Gulf Coast Classification of Pitch Pine Resawn Lumber and Sawn Timber, 1923. Includes list of defects, general rules, and grading rules for boards.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and Western red cedar boards.

References.—American Lumber Standards for softwood boards, *see* 400.0; other shipping crate specifications, *see* 954-36; wooden boxes, *see* 953.3; finish, *see* 411-43; plank, *see* 412.1; shop and factory board, *see* 413; strips, *see* 402.41.

402.43 Dimension Lumber

California Redwood Assn. Standard Specifications, 1942. Dimension Boards. Conforms to American Lumber Standards. Gives requirements for rough and dressed sizes.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber and White Cedar Shingles, 1941. Conform to American Lumber Standards. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards; description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, and dimension or piece stuff. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce, 1941. Conform to American Lumber Standards. Variations from American Lumber Standards are noted. Includes official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes, measurements, and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades for dimension and timber.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for dimension lumber.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and Western red cedar dimension.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS60-36; 1936. Hardwood Dimension Lumber. Hardwood dimension lumber, as covered by this standard, is defined as kiln-dried hardwoods processed to a point where the maximum waste is left at the dimension mill, and the maximum utility delivered to the user. It sets forth general requirements relative to seasoning, gluing, and workmanship; detail requirements covering grades of flat stock and squares; standard measurement methods; tolerances and inspection; recommended uses of various grades, control of moisture content, and shrinkage of wood. Included, also, is a facsimile of a guarantee certificate to be used by manufacturers in extending to purchasers assurance of the quality of lumber. Sponsored by the Hardwood Dimension Manufacturers Assn.

References.—American Lumber Standards for softwood dimension lumber, *see* 400.0; hardwood grading rules, *see* 400.3; structural timbers, *see* 412.1, 412.9; plank, *see* 412.1; furniture dimension stock, *see* 413.53.

402.5 LATHS AND SHINGLES

402.51 Lath

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Lathing and Plastering. Gives requirements for wood lath and lathing.

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes two grades of common wood lath, dimensions, and permissible defects; also for Byrkit lath, with dimensional diagram of form.

California Redwood Assn. Standard Specifications, 1942. Wood Lath. Conforms to American Lumber Standards. Gives requirements for one grade as to quality and standard dimensions.

Contracting Plasterers' International Assn. Standard Specification. Includes requirements for wood lath.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber and White Cedar Shingles, 1941. Conform to American Lumber Standards. Includes official grade, trade, and species marks; official shipper's certificates; rules for grading Bykrit lath and hemlock lath; and standard planing mill patterns for Bykrit lath.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce, 1941. Conform to American Lumber Standards. Variations from American Lumber Standards are noted. Includes official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes, measurements, and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades for lath.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for Byrkit and plastering lath.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and Western red cedar lath.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and requirements for lath—all species.

References.—American Lumber Standards for Byrkit lath, *see* 400.0; lathing practice; *see* 514.63; metal lath, *see* 605.24.

402.52 Shingles

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Carpentry and Millwork. Gives requirements for shingles.

California Redwood Assn. Standard Specifications, 1942. Shingles. Rules for manufacture, grading, packing, labeling, and inspection. Conforms to American Lumber Standards. Gives requirements for dimension shingles. Shall conform to the requirements of Simplified Practice Recommendation R16-39 and Commercial Standard CS 31-38 of the Dept. of Commerce, National Bureau of Standards.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber and White Cedar Shingles, 1941. Conform to American Lumber Standards. Includes official grade, trade, and species marks; official shipper's certificates; and rules for grading white cedar shingles.

Red Cedar Shingle Bureau. Certigrade Handbook of Red Cedar Shingles, 1940. Covers manufacture, seasoning, and storage of shingles and description; use recommendations for 16-in., 18-in., and 24-in. shingles; discussion of grades; sizes and packing rules; recommended practices in the application of certigrade shingles; master specifications covering sheathing boards, roofers, sheathing paper, shingles, hips and ridges, valleys, nails and nailing, and flashings; and table of covering capacities of certigrade shingles.

Red Cedar Shingle Bureau. Grading and Packing Rules for Certigrade Red Cedar Shingles, 1939. Covers three grades, No. 1, No. 2, and No. 3, for 16-in. (XXXXX), 18-in. (Perfections), and 24-in. (Royals) in random width shingles, and for 24-in., 18-in., and 16-in. dimension shingles; summary of sizes, packing rules, running inches, and shipping weights; covering capacities per bundle in square feet of the various sized shingles; and general rules. Conform to U. S. Dept. of Commerce, National Bureau of Standards CS 31-38.

Red Cedar Shingle Bureau. Lumber Grade-Use Guide Pamphlet XVII; 1943. Endorsed by the National Lumber Manufacturers Assn. Western Red Cedar Shingles. Covers advantages, service, over-roofing, protection, uses, insulation, modernizing, proper nails, covering capacity for various exposures, grading and packing rules, construction details, exposure tables for roofs and sidewalls, and recommended practices in applying.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine

Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for shingles.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R16-39; 1939. Lumber (American Lumber Standards for Softwood Lumber). Shingles. Thin lumber tapered lengthwise, used overlapped on roofs and side walls with a definite portion of the length exposed to the weather. Covers grade and size standards, and packing and shipping provisions. Initiated by the Central Committee on Lumber Standards and the National Lumber Manufacturers Assn.

U.S. Gov., Dept. of Commerce, National Bureau of Standards Commercial Standard CS31-38; 1938. Wood Shingles; Red Cedar, Tidewater Red Cypress, California Redwood. This quality standard provides a minimum specification for the highest commercial grade of sawn wood shingles of the above species known as "No. 1 grade" in American Lumber Standards and as published in the 1933 Supplement to Simplified Practice Recommendation R16-29. It covers length, width, thickness, grain, characteristics, color, packing, and the grading tolerances for these requirements. It includes also glossary of terms and a facsimile of label to be used on each bundle of grade 1 shingles. Initiated by California Redwood Assn., Red Cedar Shingle Bureau, and Southern Cypress Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS6; 1938. Survey of Roofing Materials in the Southeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Southeastern States is described. Detailed studies of roofing materials in Greensboro, N. C.; Columbia, S. C.; Savannah and Atlanta, Ga.; Jacksonville and Orlando, Fla.; Birmingham, Ala.; Knoxville, Tenn.; and Charleston, W. Va., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 2,500 miles of highway, is included. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS29; 1939. Survey of Roofing Materials in the Northeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Northeastern States is described, with numerous comparative references to a similar survey in the Southeastern States. Detailed studies of roofing materials in Wilmington, Del.; Philadelphia, Pa.; New Haven, Conn.; Boston, Mass.; Manchester, N. H.; Portland, Maine; Rutland, Vt.; and Albany and Syracuse, N. Y., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 1,600 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 21,000 rural and small-town dwellings along 4,000 miles of highway in 20 Eastern States. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS75; 1941. Survey of Roofing Materials in the North Central States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the North Central States is described, with numerous references to similar surveys made previously in the Southeastern and Northeastern States. Detailed studies of roofing materials in Pittsburgh, Pa.; Cincinnati and Toledo, Ohio; Grand Rapids and Lansing, Mich.; Chicago, Ill.; Milwaukee, Wis.; St. Paul, Minn.; Bismarck, N. Dak.; Sioux Falls, S. Dak.; Omaha, Nebr.; Kansas City, Moberly, and St. Louis, Mo.; and Indianapolis, Ind., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 8,000 rural and small-town dwellings, along approximately 3,000 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 29,000 rural and small-town dwellings along 7,000 miles of highway in the 32 States covered by the three surveys. Forty-eight photographs, illustrating type of weathering of roofing materials, and features of design and construction of roofs, are shown.

References.—Asphalt shingles, *see* 505.16.

402.6 STRUCTURAL TIMBERS AND SHOP LUMBER

References.—Structural timbers, shop lumber, *see* 412, 413.

402.7 SOFTWOOD LUMBER SPECIFICATIONS

References.—Softwood grading rules, *see* 400.2; structural timbers, *see* 412.

402.70 General Items

402.8 HARDWOOD LUMBER SPECIFICATIONS

U. S. Gov., Federal Specification MM-L-736; 1935. Amendment 3; 1944. Lumber and Timber; Hardwood. Hardwood factory lumber (i.e., standard grades of firsts and seconds, selects, No. 1 common, No. 2 common, sound wormy, No. 3A common, and No. 3B common) and hardwoods for construction work shall conform to the Rules for the Measurement and Inspection of Hardwood Lumber of the National Hardwood Lumber Assn. In cases where lumber of a special width, length, or thickness is needed, such lumber shall conform to the standard grades of the National Hardwood Lumber Assn. except in the matter of width, length, and thickness.

References.—Hardwood grading rules, *see* 400.3; structural timbers, *see* 412.

402.9 MISCELLANEOUS SPECIFICATIONS FOR SAWN LUMBER

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Treated and Untreated Timber.

U. S. Gov., Navy Dept. Specification 39-I-1; 1944. Iroko.

References.—Veneer and furniture stock, *see* 413.52, 413.53.

403. SURFACED AND WORKED LUMBER

403.1 DRESSED LUMBER

References.—Dressed lumber, *see* 411,413.

403.2 MATCHED, SHIP-LAPPED, AND PATTERNED LUMBER

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes log cabin siding made from and graded under standard dimension, with shiplap or dressed and matched joints, and cut oval exposed face.

References.—Matched, ship-lapped, and patterned lumber, *see* 411, 413.

404. LUMBER FOR PRESERVATIVE TREATMENT

404.0 GENERAL ITEMS

American Wood-Preservers' Assn., 2d; 1942. Standard Recommendations for the Purchase and Preservation of Forest Products. Gives general requirements, treatment, results of treatment, preservatives, inspection, and care after treatment.

References.—Preservative treatment of lumber, *see* 400.4.

410-419 LUMBER FOR BUILDING AND FACTORY USE

411. YARD LUMBER FOR GENERAL BUILDING PURPOSES

411.0 GENERAL ITEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Carpentry and Millwork. Gives requirements for sheathing, siding, flooring, furring, grounds, and finish and trim.

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Includes table of rough and dressed sizes of American standard yard lumber and timbers and table of properties of American standard lumber sizes giving area of section, moment of inertia, section modulus, board feet per lineal foot, and weight per lineal foot for woods of various weights.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber; 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for yard lumber.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and western red cedar yard lumber.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber; 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and grading rules for yard lumber—all species.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R16-39; 1939. Lumber (American Lumber Standards for Softwood Lumber). Yard Lumber. Lumber manufactured and classified into those sizes, shapes, and qualities required for ordinary construction and general-purpose use. Provides grade and size standards, description of the dimensions of lumber, workings and moldings. Initiated by the Central Committee on Lumber Standards and the National Lumber Manufacturers Assn.

U. S. Gov., Federal Specification MM-L-751c; 1942. Amendment 1; 1944. Lumber and Timber; Softwood. Covers the principal species of softwood grown in the United States; the three classes of softwood lumber and timber—yard lumber, structural material, and factory and shop lumber—and the grades in the current grading rules of the various associations of softwood lumber manufacturers that conform to American Lumber Standards.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Treated and Untreated Timber.

411.1 SIDING

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes drop and bevel siding, dimensions of standard patterns, in plain and end-matched, in conformity with American Lumber Standards.

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes drop and bevel sidings, cove rustic, and round edge, bungalow, economy, anzac, and log cabin siding, with dimensional diagrams for each pattern.

California Redwood Assn. Standard Specifications, 1942. Siding, Bevel, Bungalow, Colonial, and Drop. Conforms to American Lumber Standards. Gives requirements for rough and dressed sizes, for Clear All Heart and A and B grades.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber, and White Cedar Shingles, Conform to American Lumber Standards, 1941. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards; description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, and drop siding and bevel siding; and standard planing mill patterns for drop siding. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce, conform to American Lumber Standards, 1941. Variations from

American Lumber Standards are noted. Includes official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes, measurements, and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades for bevel siding and drop siding.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions; definitions; general grading provisions; specifications and grading rules for bevel, barn, log cabin, and drop siding.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and Western red cedar bevel and drop and rustic siding.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and requirements for bevel, bungalow, and colonial siding.

References.—American Lumber Standards for softwood siding, *see* 411.0.

411.2 FLOORING

411.21 Cedar Flooring

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks, general instructions, moisture content provisions, definitions, thicknesses and widths, and grading rules for Western red cedar flooring.

References.—American Lumber Standards for softwood flooring, *see* 411.0.

411.22 Cypress Flooring

References.—American Lumber Standards for softwood flooring, *see* 411.0.

411.23 Fir and Douglas Fir Flooring

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir flooring.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and grade requirements for industrial flooring and decking.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS14; 1939. Indentation and Recovery of Low-Cost Floor Coverings. Indentation and recovery determinations for loads ranging from 25 lb. to 200 lb. on a flat-ended pin 1/4 in. in diameter were made on 23 floor coverings at a relative humidity of 65 percent and temperature of 72° F. Indentation readings were taken for each load at intervals of time up to 30 min. and then recovery readings at intervals of time up to 120 min. Various types of floor coverings were tested, such as asphalt tile, pressed fiberboard, linoleums, felt-base floor coverings having various wearing surfaces, rubber, and wood. A description of the apparatus and the procedure used are given. The results are presented in graphic form to show the relative merits of the various floor coverings with respect to initial and 30-min. indentation under various loads and the recovery after removal of the load.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, stripwood, and plywood subfloors. Installations on stripwood subfloors were made with underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given, and photographs of the test panels after 48,000 cycles of the testing equipment are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS73; 1941. Indentation Characteristics of Floor Coverings. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65-percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevated temperature of 90° F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedure are briefly described. Summaries of the results are present to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 26 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were work tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given, and their appearance at the end of the test is shown by photographs. A few generalized comments and conclusions are made.

References.—American Lumber Standards for softwood flooring, *see* 411.0.

411.24 Hemlock Flooring

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber and White Cedar Shingles, Conform to American Lumber Standards, 1941. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards; description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, and flooring; and standard planing mill patterns for flooring. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce, Conform to American Lumber Standards, 1941. Variations from American Lumber Standards are noted. Includes official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes, measurements, and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades for flooring.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for West Coast hemlock flooring.

References.—American Lumber Standards for softwood flooring, *see* 411.0.

411.25 Maple Flooring

Maple Flooring Manufacturers Assn. Grading Rules for Northern Hard Maple (Acer Saccharum), Beech, and Birch Flooring, 1941. Includes description of individual characteristics of Northern hard maple and of Northern beech and birch floorings; grading rules for First, Second, Third, and three Special grades; standard measurements; kiln-drying; end matching; custom in bundling; thicknesses and faces; rules for estimating quantity of flooring required; grade-use recommendations; and uses of different thicknesses.

National Oak Flooring Manufacturers' Assn. Official Flooring Grading Rules, effective Nov. 8, 1943. Birch, Beech, and Hard Maple. Gives requirements for first grade, second grade, third grade, victory grade, special grades, standard sizes, counts and weights, special thicknesses, jointed flooring, general rules, rules governing re-inspections, and how to arrive at the amount of hardwood flooring required.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS14; 1939. Indentation and Recovery of Low-Cost Floor Coverings. Indentation and recovery determinations for loads ranging from 25 lb. to 200 lb. on a flat-ended pin 1/4 in. in diameter were made on 23 floor coverings at a relative humidity of 65 percent and temperature of 72° F. Indentation readings were taken for each load at intervals of time up to 30 min. and then recovery readings at intervals of time up to 120 min. Various types of floor coverings were tested, such as asphalt tile, pressed fiberboard, linoleums, felt-base floor coverings having various wearing surfaces, rubber, and wood. A description of the apparatus and the procedure used are given. The results are presented in graphic form to show the relative merits of the various floor coverings with respect to initial and 30-min. indentation under various loads and the recovery after removal of the load.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS34; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 1. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on 40 different test installations involving 12 floor coverings and 11 adhesives. The floor coverings tested included severals kinds of lineoleum, felt-base floor coverings having various wearing surfaces, pressed fiberboard, and three stripwood floors. The bonding agents used included lignin pastes, various resinous cements, casein-latex cement, asphaltic cements, and nails. Installations on both a concrete subfloor and a wood subfloor were tested. Descriptions of the testing equipment and test installations are given. Results showing the relative magnitude of the depressions in the floor coverings caused by the testing equipment are summarized and presented in tables. The appearance of the various installations after 48,000 cycles of the testing equipment is discussed and representative photographs are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS43; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 2. In the second series, 40 installations were subjected to a performance test in the floor-testing chamber of the National Bureau of Standards. Included in the tests were battleship linoleum, rubber in sheet and tile form, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of asphalt tiles. The bonding agents used included lignin pastes, resinous cements, latex adhesives, rubber cements, cut-back asphalt, and asphalt emulsions. Installations were made on both concrete and wood subfloors. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries showing the performance of the test panels are given, and the appearance of the different floor coverings after 48,000 cycles of the testing equipment is shown by representative photographs.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, stripwood, and plywood subfloors. Installations on stripwood subfloors were made with underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given, and photographs of the test panels after 48,000 cycles of the testing equipment are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS73; 1941. Indentation Characteristics of Floor Coverings. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65-percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevated temperature of 90° F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedures are briefly described. Summaries of the results are presented to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 28 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were cork tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given, and their appearance at the end of the test is shown by photographs. A few generalized comments and conclusions are made.

U. S. Gov., Federal Specification MM-L-736; 1935. Amendment 3; 1944. Lumber and Timber; Hardwood. Maple, birch, and beech flooring shall conform to the rules of the Maple Flooring Manufacturers' Assn., or to the rules of the National Oak Flooring Manufacturers' Assn. In cases where lumber of a special width, length, or thickness is needed, such lumber shall conform to the stanoard grades of the National Hardwood Lumber Assn. except in the matter of width, length, and thickness.

References.—American Lumber Standards for softwood flooring, *see* 411.0; hardwood grading rules, *see* 400.3.

411.26 Oak Flooring

National Oak Flooring Manufacturers' Assn. Official Flooring Grading Rules, effective Nov. 8, 1943. Oak. Gives requirements for quarter-sawed and plain-sawed, standard thicknesses and widths, square edge strip flooring, standard counts and weights, general rules, rules governing re-inspections, and how to arrive at the amount of hardwood flooring required.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS56-41; 1941. Oak Flooring. This standard provides minimum specifications for three grades of quarter-sawed and four grades of plain-sawed white oak and red oak flooring. It covers standard dimensions for length, width, and thickness of tongue-and-grooved, and square-edged strip flooring. It also covers defects, bundling, inspection, and a method of certifying compliance with the standards. Initiated by National Oak Flooring Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS14; 1939. Indentation and Recovery of Low-Cost Floor Coverings. Indentation and recovery determinations for loads ranging from 25 lb. to 200 lb. on a flat-ended pin 1/4 in. in diameter were made on 23 floor coverings at a relative humidity of 65 percent and temperature of 72° F. Indentation readings were taken for each load at intervals of time up to 30 min. and then recovery readings at intervals of time up to 120 min. Various types of floor coverings were tested, such as asphalt tile, pressed fiberboard, linoleums, felt-base floor coverings having various wearing surfaces, rubber, and wood. A description of the apparatus and the procedure used are given. The results are presented in graphic form to show the relative merits of the various floor coverings with respect to initial and 30-min. indentation under various loads and the recovery after removal of the load.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS34; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 1. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on 40 different test installations involving 12 floor coverings and 11 adhesives. The floor coverings tested included several kinds of linoleum, felt-base floor coverings having various wearing surfaces, pressed fiberboard, and three stripwood floors. The bonding agents used included lignin pastes, various resinous cements, casein-latex cement, asphaltic cements, and nails. Installations on both a concrete subfloor and a wood subfloor were tested. Descriptions of the testing equipment and test installations are given. Results showing the relative magnitude of the depressions in the floor coverings caused by the testing equipment are summarized and presented in tables. The appearance of the various installations after 48,000 cycles of the testing equipment is discussed and representative photographs are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, stripwood, and plywood subfloors. Installations on stripwood subfloors were made with underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given, and photographs of the test panels after 48,000 cycles of the testing equipment are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS73; 1941. Indentation Characteristics of Floor Covering. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65-percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevsted temperature of 90° F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedure are briefly described. Summaries of the results are present to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 26 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were cork tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given, and their appearance at the end of the test is shown by photographs. A few generalized comments and conclusions are made.

U. S. Gov., Federal Specification MM-L-736; 1935. Amendment 3; 1944. Lumber and Timber; Hardwood. Oak flooring and pecan flooring shall conform to the rules of the National Oak Flooring Manufacturers' Assn. In cases where lumber of a special width, length, or thickness is needed, such lumber shall conform to the standard grades of the National Hardwood Lumber Assn. except in the matter of width, length, and thickness.

References.—American Lumber Standards for softwood flooring, *see* 411.0; hardwood grading rules, *see* 400.3.

411.27 Pine Flooring

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes plain-end and end-matched, edge and flat grain in four grades of each, with two common grades of flat grain plain, general requirements, moisture content, etc. Conforms to American Lumber Standards. Also factory flooring, heavy roofing, and decking, grades, dimensions, permissible defects, and weights.

Southern Pine Inspection Bureau of the Southern Pine Assn. The Gulf Coast Classification of Pitch Pine Resawn Lumber and Sawn Timber, 1923. Includes list of defects, general rules, and grading rules for flooring.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for flooring.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS14; 1939. Indentation and Recovery of Low-Cost Floor Coverings. Indentation and recovery determinations for loads ranging from 25 lb. to 200 lb. on a flat-ended pin 1/4 in. in diameter were made on 23 floor coverings at a relative humidity of 65 percent and temperature of 72° F. Indentation readings were taken for each load at intervals of time up to 30 min. and then recovery readings at intervals of time up to 120 min. Various types of floor coverings were tested, such as asphalt tile, pressed fiberboard, linoleums, felt-base floor coverings having various wearing surfaces, rubber, and wood. A description of the apparatus and the procedure used are given. The results are presented in graphic form to show the relative merits of the various floor coverings with respect to initial and 30-min. indentation under various loads and the recovery after removal of the load.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS34; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 1. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on 40 different test installations involving 12 floor coverings and 11 adhesives. The floor coverings tested included several kinds of linoleum, felt-base floor coverings having various wearing surfaces, pressed fiberboard, and three stripwood floors. The bonding agents used included lignin pastes, various resinous cements, casein-latex cement, asphaltic cements, and nails. Installations on both a concrete subfloor and a wood subfloor were tested. Descriptions of the testing equipment and test installations are given. Results showing the relative magnitude of the depressions in the floor coverings caused by the testing equipment are summarized and presented in tables. The appearance of the various installations after 48,000 cycles of the testing equipment is discussed and representative photographs are shown.

References.—American Lumber Standards for softwood flooring, *see* 411.0.

411.28 Spruce Flooring

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Sitka spruce flooring.

References.—American Lumber Standards for softwood flooring, *see* 411.0.

411.29 Miscellaneous Flooring Specifications

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes flooring, narrow, standard, and wide in three thicknesses, with dimensional diagrams.

California Redwood Assn. Standard Specifications, 1942. Flooring. Conforms to American Lumber Standards. Gives requirements for rough and dressed sizes, Clear All Heart and A and B grades.

Maple Flooring Manufacturers Assn. Grading Rules for Northern Hard Maple (Acer Saccharum), Beech, and Birch Flooring, 1941. Includes description of individual characteristics of Northern hard maple and of Northern beech and birch floorings; grading rules for First, Second, Third, and three Special grades; standard measurement; kiln-drying; end matching; custom in bundling; thicknesses and faces; rules for estimating quantity of flooring required; grade-use recommendations; and uses of different thicknesses.

National Oak Flooring Manufacturers' Assn. Official Flooring Grading Rules, effective Nov. 8, 1943. Birch, Beech, and Hard Maple. Gives requirements for first grade, second grade, third grade, victory grade, special grades, standard sizes, counts and weights, special thicknesses, jointed flooring, general rules, rules governing re-inspections, and how to arrive at the amount of hardwood flooring required.

National Oak Flooring Manufacturers' Assn. Official Flooring Grading Rules, effective Nov. 8, 1943. Pecan. Gives requirements for red and white, various grades, standard counts and weights, general rules, rules governing re-inspections, and how to arrive at the amount of hardwood flooring required.

U. S. Gov., Federal Specification MM-L-736; 1935. Amendment 3; 1944. Lumber and Timber; Hardwood. Maple, birch, and beech flooring shall conform to the rules of the Maple Flooring Manufacturers' Assn., or to the rules of the National Oak Flooring Manufacturers' Assn. In cases where lumber of a special width, length, or thickness is needed, such lumber shall conform to the standard grades of the National Hardwood Lumber Assn. except in the matter of width, length, and thickness.

U. S. Gov., Federal Specification MM-L-736; 1935. Amendment 3; 1944. Lumber and Timber; Hardwood. Oak flooring and pecan flooring shall conform to the rules of the National Oak Flooring Manufacturers' Assn. In cases where lumber of a special width, length, or thickness is needed, such lumber shall conform to the standard grades of the National Hardwood Lumber Assn. except in the matter of width, length, and thickness.

References.—American Lumber Standards for flooring of softwood, *see* 411.0; hardwood grading rules, *see* 400.3.

411.3 CEILING LUMBER

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes ceiling lumber plain and end-matched, dressed sizes, standard workings, lengths, moisture content, etc. Conforms to American Lumber Standards.

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes ceiling, dimensional diagrams of stock patterns.

California Redwood Assn. Standard Specifications, 1942. Ceiling Lumber. Conforms to American Lumber Standards. Gives requirements for Clear All Heart and A and B grades.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber and White Cedar Shingles, Conform to American Lumber Standards, 1941. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards, description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, and ceiling; and standard planing mill patterns for ceiling. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce, Conform to American Lumber Standards, 1941. Variations from American Lumber Standards are noted. Include official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes, measurements, and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades for ceiling.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for ceiling.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, and Sitka spruce ceiling.

References.—American Lumber Standards for softwood ceiling, *see* 411.0; hardwood grading rules, *see* 400.3.

411.4 PARTITION LUMBER, MOLDINGS, AND FINISH LUMBER

411.41 Partition Lumber

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes boarding, wall boarding, battens, etc., beaded, mitered and grooved, tongued and grooved, and shiplapped, with dimensional diagrams.

California Redwood Assn. Standard Specifications, 1942. Partition Lumber. Conforms to American Lumber Standards. Gives requirements for Clear All Heart and A and B grades.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for partition.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, and Sitka spruce partition.

References.—American Lumber Standards for softwood partition, *see* 411.0; hardwood grading rules, *see* 400.3.

411.42 Moldings

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1931. Includes moldings and poster moldings, dimensional diagrams of stock patterns.

California Redwood Assn. Standard Specifications, 1942. Moldings, Lattice. Gives requirements for grade A and better, lengths, finish, and defects.

Southern Pine Inspection Bureau of the Southern Pine Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for moldings.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and Western red cedar moldings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R16-39; 1939. Lumber (American Lumber Standards for Softwood Lumber). Moldings. Gives illustrations and correct sizes of moldings of the 7,000 series. They can be used as a guide for design and the specifications of moldings. Initiated by the Central Committee on Lumber Standards and the National Lumber Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Commercial Standard CS76-39; 1939. Hardwood Interior Trim and Molding. This standard provides minimum specifications for two grades of hardwood interior trim and molding known as grade A, which is suitable for natural finish and highest quality paint finish, and grade B, which is normally confined to a paint finish, of sizes and design as shown in the 7,000 Series, Appendix D of Simplified Practice Recommendation R16-29, effective Nov. 1, 1932. It covers allowable defects, design, length, width, bundling, and the grading tolerances for these requirements. Hardwood Dimension Manufacturers Assn., sponsor.

References.—American Lumber Standards for softwood molding and interior trim, *see* 411.0; hardwood grading rules, *see* 400.3.

411.43 Finish Lumber

Appalachian Hardwood Manufacturers. Standardized Hardwood Wall Paneling, 1939. Includes standard types of vertical, horizontal, and combination panels, moldings and trim; of white oak, beech, birch, chestnut, and maple; also available in red oak, butternut, and yellow poplar. Dimensional drawings of standard shapes, installation instructions, and illustrations.

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes finish lumber in three grades, lengths, for dressed yard and industrial lumber. Nominal and dressed dimensions, widths of dressed material exceeds American Lumber Standards, and gives moisture content requirements.

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes interior finish lumber, dimensional diagrams of stock patterns.

California Redwood Assn. Standard Specifications, 1942. Finish Lumber. Conforms to American Lumber Standards. Gives requirements for Clear All Heart and A and B grades, with rough and dressed sizes.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for finish.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West

Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and Western red cedar finish-casing and base.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Commercial Standard CS74-39; 1939. Solid Hardwood Wall Paneling. This standard provides for two classes of 3/4-in. solid hardwood wall paneling manufactured to standard tongued-and-grooved patterns, in six face widths from 3 to 8 in., available in seven exact lengths from 2 ft. 6 in. to 8 ft. 8 in. It also covers random lengths of 2 ft. and up on 6-in. breaks and harmonizing molding and trim patterns. Sponsored by hardwood lumber industry through American Walnut Manufacturers Assn.; Appalachian Hardwood Manufacturers, Inc.; Hardwood Dimension Manufacturers Assn.; Mahogany Assn., Inc.; National Hardwood Lumber Assn.; Northeastern Lumber Manufacturers Assn., Inc.; Northern Hemlock and Hardwood Manufacturers Assn.; Philippine Mahogany Manufacturers' Import Assn., Inc.; and Southern Hardwood Producers, Inc.

U. S. Gov., Federal Specification MM-L-736; 1935. Amendment 3; 1944. Lumber and Timber; Hardwood. Trim shall conform to the rules of the Hardwood Interior Trim Manufacturers' Assn. In cases where lumber of a special width, length, or thickness is needed, such lumber shall conform to the standard grades of the National Hardwood Lumber Assn. except in the matter of width, length, and thickness.

References.—American Lumber Standards for softwood finish, *see* 411.0; hardwood grading rules, *see* 400.3; miscellaneous millwork, *see* 423.9.

411.5 SHIP-LAP LUMBER

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes shiplap, definitions of defects, dimensional drawings for yard and heavy grades, and permissible defects, in conformity with American Lumber Standards.

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes shiplap, interior and exterior types of plain and molded patterns, with dimensional diagrams of stock patterns.

California Redwood Assn. Standard Specifications, 1942. Drop Siding or Shiplap. Conforms to American Lumber Standards. Gives requirements for Clear All Heart, and A and B grades.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber and White Cedar Shingles, Conform to American Lumber Standards, 1941. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards; description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, and shiplap; and standard planing mill and detail patterns for shiplap. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for shiplap.

References.—American Lumber Standards for softwood ship-lap, *see* 411.0; hardwood grading rules, *see* 400.3.

411.6 DRESSED AND MATCHED YARD LUMBER

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes dressed and matched yard lumber, defect definitions, dimensions and grade definitions with permissible defects in accordance with American Lumber Standards, moisture content requirements.

California Redwood Assn. Standard Specifications, 1942. Dressed and Matched Yard Lumber. Conforms to American Lumber Standards. Gives requirements for rough and dressed sizes, requirements as to quality of various grades with permissible sapwood and defects.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber and White Cedar Shingles, Conform to American Lumber Standards, 1941. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards; description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, and dressed and matched; and standard planing mill patterns for D and M. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce, conform to American Lumber Standards, 1941. Variations from American Lumber Standards are noted. Includes official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes; measurements and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades for dressed lumber.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications and grading rules for dressed and matched yard lumber.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and Western red cedar dressed and matched yard lumber.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions; measurements and tally; definitions of defects; reinspection; and requirements for dressed and matched yard lumber.

References.—American Lumber Standards for softwood D. and M., *see* 411.0; hardwood grading rules, *see* 400.3.

411.7 ROOFING LUMBER

California Redwood Assn. Standard Specifications, 1942. Decking, Heavy Roofing, and Factory Flooring. Conforms to American Lumber Standards. Gives requirements for three grades of common and rough and dressed sizes.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications and grading rules for roofing.

References.—American Lumber Standards for softwood roofing, *see* 411.0; hardwood grading rules, *see* 400.3; wood shingles, *see* 402.52.

411.8 SHELVING

U. S. Gov., Veterans Administration. Specification VA-G-94c; 1937. Wooden Library Shelving.

411.9 MISCELLANEOUS SPECIFICATIONS FOR BUILDING LUMBER

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions; definitions; general grading provisions; specifications and grading rules for base, casing, door jambs, window jambs, planks, and trim.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for Douglas fir, West Coast hemlock, Sitka spruce, and Western red cedar box lumber, capping and grooved trunking, corn cribbing, barge (framing, planking, and decking), battens, flume lumber, ladder stock, paneling, piano posts, pickets, pipe stave stock, porch columns, ship decking, shop plank, silo staves, stepping, wagon bottoms, well tubing and windmill stock.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS26-30; 1930. Aromatic Red Cedar Closet Lining. A commercial standard selected and accepted by industry for clothes closet lining covering requirements on species of wood, standard thicknesses, lengths, widths, details of matching, percentage of heartwood, and permissible defects. Sponsored by Aromatic Red Cedar Closet Lining Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS89-40; 1940. Hardwood Stair Treads and Risers. This standard provides minimum specifications for hardwood stair treads and risers. It covers three grades of treads in three widths and four grades of risers in four widths which are available in five standard lengths. It also covers species, approved tread-nosing pattern, nomenclature and definitions, and a method of certification of compliance with the standard. Sponsored by Hardwood Dimension Manufacturers Assn.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-129. Alaska-Type Transmitter Building; Erection of.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-157. Alaska-Type Transmitter Building; Prefabricated, Wood, Erection of.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-245. Alaska-Type Quarters Building; Prefabricated, Wood.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-255. Alaska-Type Utility Building; Prefabricated, Wood.

References.—American Lumber Standards, *see* 411.0; hardwood grading rules, *see* 400.3.

412. STRUCTURAL TIMBERS AND BRIDGES

412.0 GENERAL ITEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Building for Railroad Purposes: Carpentry and Millwork. Gives requirements for seasoning, species and grades, dressing, treated lumber, termite shields, framing, joists, partitions, and roof framing.

American Society for Testing Materials, D 9-30; 1930. Definitions of Terms Relating to Timber. Defines structural timber, terms relating to wood, standard defects, standard names for structural timbers, and appendix covering details for knots.

American Society for Testing Materials, D 143-27; 1927. American Standards Assn., O4a-1927. Methods of Testing Small Clear Specimens of Timber. Selection, preparation, and storage of test specimens, test procedure for static and impact bending, tension, compression, hardness, shear, cleavage, specific gravity, shrinkage, and moisture content.

American Society for Testing Materials, D 198-27; 1927. American Standards Assn., O4b-1927. Methods of Static Tests of Timbers in Structural Sizes. Covers number and sizes of test specimens, moisture control, apparatus, and procedure for static bending test, for compression, and for minor tests, permissible variations, and sample data sheets.

National Lumber Manufacturers Assn. Heavy Timber Mill Construction Details, 1929. Illustrates (by means of line drawings) good practice in heavy timber construction detailing.

National Lumber Manufacturers Assn. House Framing Details, 1929. Reprinted, 1941. Includes plates illustrating satisfactory methods of assembling the structural parts of frame buildings. The information presented has been developed from the results of common practice that have been demonstrated and proved. It reflects recent research and laboratory findings.

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Includes physical, chemical, and mechanical properties of wood, timber quality—strength relations, glossary of lumber terms, abbreviations of lumber terms, board measure, lumber quantity costs, sizes of American standard yard lumber and timbers, notations and technical symbols, properties of American standard lumber sizes; design data and formulae for computing sizes of beams, columns, and plank and laminated floors; tables of beam sizes required to support a given load over a given span; tables of least dimensions for columns required to support a given load for various column lengths; and tables for sizes of plank and laminated floors of various thicknesses for safe uniform load for a given span.

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Supplement No.1; 1943. Working Stresses for Structural Lumber. Includes general discussion, determination of required sizes, allowable unit stresses, and timber column formula; and table showing stresses for joists and planks, beams and stringers, and posts and timbers for kinds of lumber.

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Supplement No.3. Maximum Spans for Joists and Rafters. Includes tables of sizes required to support a given load over a given span for ceiling joists, attic floor joists, floor joists, and rafters and roof joists.

National-Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Supplement No.4. Wood Columns—Safe Loads. Formulas and safe loads per square inch of cross-sectional area of concentrically loaded simple solid and spaced columns are given. Short-time and long-time safe loads are presented in both tabular and graphical form. By assuming the length of column to be the distance between adjacent lateral supports, the data for simple solid and spaced columns may also be applied to columns or compression members continuous through several lateral supports.

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Supplement No.5. Wood Trusses—Stress Coefficients, Length Coefficients, and Angles. Includes glossary of terms, limitations, notations, and tables of strength coefficients, length coefficients, and angles for pitched type trusses (Belgian, Fink and Fan, Howe, and Pratt) and flat type trusses (Howe, Pratt, modified Pratt, and Howard).

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Supplement No.6. Timber Connectors—Design and Load Data. Includes illustrations of types of Teco timber connectors, design, and load data tables for each type, specification when galvanizing is required, and legend for timber connectors, grooves, and daps.

National Lumber Manufacturers Assn. Wood Structural Design Data, Volume 1; 1941. Supplement No.7. Stud Walls—Safe Axial Loads. The sizes and spacings of studs in walls as developed through general construction practice have proved conservative and satisfactory. There are cases, however, when it may be desirable to obtain a more accurate design in the interests of economy or structural requirements of wider spacings and unusual loads. Therefore this pamphlet on the strength of stud walls, which is based on the column formulas and recommendations of the Forest Products Laboratory, Forest Service, U.S. Dept. of Agriculture, has been prepared.

National Lumber Manufacturers Assn. Wood Utilization Data No.3; 1940. Plank-and-Beam Floor and Roof System for Residential Construction. The adaption of the plank-and-beam type of floor and roof system to residential construction has brought from architects and builders many technical questions concerning its application. This publication presents detailed technical data pertaining to adaption, advantages and economy, architectural and construction details, and structural requirements of the plank-and-beam system in residential construction.

National Lumber Manufacturers Assn. Wood Utilization Data No.4; 1943. Heavy Timber Construction Details. Includes floor framing, column and floor framing details, roof framing details, types of connections, other details, scope of these details, and thirteen plates showing heavy timber construction details.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Hemlock and Tamarack Lumber and White Cedar Shingles, Conform to American Lumber Standards, 1941. Includes official grade, trade, and species marks; official shipper's certificates; official grading rules for hemlock and tamarack lumber, including yard and industrial size standards; description, measurement, and tally; inspection and shipping provisions; definitions of defects; rules for grading yard lumber, finishing lumber, heavy joist, timbers, and structural joists and rafters. Officially adopted by the Northeastern Lumber Manufacturers Assn., Inc., for the grading of hemlock and tamarack produced in New York, Pennsylvania, and the New England States.

Northern Hemlock and Hardwood Manufacturers Assn. Official Grading Rules for Northern (Genuine) White Pine, Norway Pine, and Eastern Spruce, Conform to American Lumber Standards, 1941. Variations from American Lumber Standards are noted. Includes official grade, trade, and species marks; official shipper's certificates; general grading instructions; sizes, measurements, and tally; inspection and shipping provisions; definitions of terms describing grades; association standard grades for structural joist and rafters of Norway pine.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for structural grades.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and standard specifications and working stresses for structural grades of larch and Douglas fir structural joists, plank, posts, and timbers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R16-39; 1939. Lumber (American Lumber Standards for Softwood Lumber). Structural Lumber. Basic provisions for selection and inspection where working stresses are required. Provides classifications, general provisions, and structural grade limitations for joists and planks, beams and stringers, and posts and timbers. Initiated by the Central Committee on Lumber Standards and the National Lumber Manufacturers Assn.

U. S. Gov., War Production Board, Conservation Div. National Emergency Specifications for the Design, Fabrication, and Erection of Stress Grade Lumber and Its Fastenings for Buildings—Directive No.29; Aug. 1943. Covers general-stress grade lumber, allowable unit stresses for stress grade lumber, design loads, design formulas and provisions, timber connector joints, bolted joints, lag screw joints, nail, spike, drift pin, and wood screw joints, glued laminated structural members, and appendices. Endorsed by the National Lumber Mfrs. Assn.

412.1 STRUCTURAL TIMBERS

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for structural timber, lumber, and piling—requirements for species of woods and limitations of use; grading yard lumber (to conform to American Lumber Standards); hewn and round timbers; grading of structural timber (conforming to principles of strength grading Simplified Practice Recommendation R-16) for general requirements, knots, shakes, checks, splits, density, grain, structural joist and plank with load applied to either the wide face or the narrow face, structural beams and stringers with load applied to the narrow face, and structural posts and timbers to carry longitudinal loads.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1941. Specifications for Structural Timbers. Gives requirements for grading structural timbers on the basis of unit working stresses, kinds of wood, physical properties, sizes, tolerances and surfacing allowances, manufacture, and inspection; and standard stress-grades and working stresses for joist and plank, beams and stringers, and posts and timbers of the various grades and species of softwoods and hardwoods.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Roadway Protection. Covers retaining structures in sliding cuts. Gives requirements for timber, concrete, and metal cribbing; and dry rubble, masonry, and concrete walls.

American Society for Testing Materials, D 245-37; 1937. American Standards Assn., 07-1939. Structural Wood Joist and Plank, Beams and Stringers, and Posts and Timbers. Gives general requirements for all stress grades such as decay, slope of grain, holes, shakes, checks, and splits; additional requirements when heartwood, density, and close grain are required, tables for 1,800, 1,600, 1,400, 1,200, and 1,100-lb. structural joist and plank, for beams and stringers, and for posts and timbers, standard size minimums, and working stresses. These specifications were prepared jointly by the American Railway Engineering Assn. and the A.S.T.M.

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes dimension and small timbers, utility timbers and heavy joists, decking, and heavy shiplap structural lumber; defines density rule, close and medium grain, moisture content requirements, grades and dimensions with table of unit working stresses, weights, and permissible defects, in conformity with American Lumber Standards.

California Redwood Assn. Standard Specifications, 1942. Structural Grades of California Redwood. Conforms to American Lumber Standards. Gives definitions of four grades, quality requirements, sizes, defects, joists and plank, beam and stringer, and table of allowable working stresses for each grade.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for structural timbers.

U. S. Gov., Federal Specification MM-L-751c; 1942. Amendment 1; 1944. Lumber and Timber; Softwood. Covers the principal species of softwood grown in the United States; the three classes of softwood lumber and timber—yard lumber, structural material, and factory and shop lumber—and the grades in the current grading rules of the various associations of softwood lumber manufacturers that conform to American Lumber Standards.

References.—Other specifications for structural timber, *see* 412.0; American Lumber Standards for structural grades, *see* 412.0; hardwood grading rules, *see* 400.3; planks, dimension lumber, and joists, *see* 402.42, 402.43; heavy flooring and roofing, *see* 411.2, 411.7, 412.9; sheet piling, *see* 401.49; permissible unit stresses, *see* 400.12; methods of testing for strength, moisture, etc., *see* 400.13.

412.2 BRIDGES

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes general provisions—definition of terms, proposal requirements and conditions, award and execution of contract, scope of work, control of work and materials, legal relations and responsibility to public, prosecution and progress and measurement and pavement; specifications for construction—excavation and fill, sheet piles, bearing piles, concrete masonry, reinforcement, ashlar masonry, mortar rubble masonry, dry rubble masonry, brick masonry, steel structures, bronze or copper-alloy bearing and expansion plates, steel grid flooring, railings, painting metal structures, riprap, concrete cribbing, waterproofing, dampproofing, name plates, timber structure, preservative treatments for timber, timber cribbing, sectional plate pipe and arches, and wearing surfaces; recommendations for design—general features of design, loads, distribution of loads, unit stresses, pile loads and bearing power of soils, substructure and retaining walls, structural steel design, concrete design, design of timber structures, sectional plate pipe and arches, and rating of existing bridges; specifications and references to other specifications for cement, water for use with cement, aggregates, reinforcement, structural, eyebar and rivet steels, wrought iron, steel forgings and castings, gray-iron and malleable castings, bronze or copper-alloy bearing and expansion plates, sheet piles, steel sheet piling, steel grid floors, paint, welding, sheet metal for water stops and general use, sectional plate pipe and arches, stone for masonry, brick, bituminous materials and joint fillers, asphalt paving blocks, premolded asphalt plank, structural timber, lumber and piling, and timber preservatives; tables of moments, shears and reactions; formulas for compressive members; and truck train and equipment loadings.

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for timber structures—requirements for grades of lumber for the various structural purposes; hardware; split-ring, toothed-ring, shear-plate, claw-plate, and spike-grid connectors; storage of material; workmanship; treated lumber; untreated lumber; treatment of pile heads (two methods); holes for bolts, dowels, rods, and log screws; bolts and washers; countersinking; framing; framed bents; caps; bracing; stringers; plank floors; laminated or strip floors; wheel guards and railings; trusses; truss housings; painting: and measurement and payment.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, Apr. 1943. Specifications for Design of Wood Bridges and Trestles for Railway Loading. These specifications contemplate the use of sound piles and stress-grades of structural timbers. Gives general features of design, loads and stresses, unit stresses, and working unit stresses for structural timber.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1935. Specifications for Workmanship for Pile and Framed Trestles of Untreated Material to be Built Under Contract. Covers site, general description, general clauses, detail specifications, caps, posts, sills, sash and sway braces, longitudinal braces, girts, stringers, helper stringers, ties, guard timbers, and bulkheads.

U. S. Gov., Federal Works Agency. Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Culverts and Retaining Walls.

U. S. Gov., Federal Works Agency. Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Log Bridges.

U. S. Gov., Federal Works Agency. Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Log Culverts.

U. S. Gov., Federal Works Agency. Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Timber Bridges.

References.—Timber for bridges, *see* 412.0, 412.1; bridge flooring, *see* 411.2, 412.9; permissible unit stresses, *see* 400.12; methods of testing for strength, moisture, etc., *see* 400.13.

412.3 FRAME STRUCTURES OTHER THAN BRIDGES

International Assn. of Governmental Labor Officials, endorsing sponsor. American Standards Assn., Z20.1-1941. Specifications for Portable Steel and Wood Grandstands. (Applicable to all portable grandstands any of whose main structural members are of steel or wood.) Definitions of terms and specifications on approval, design, workmanship, loading, foundations, materials of construction, allowable stresses and special requirements.

U. S. Gov., Public Health Service, Federal Security Agency. American Standards Assn., Z4.3-1935. The Sanitary Privy. Gives introduction, health hazards of insanitary disposal of excreta, the construction of sanitary privies as a community-wide activity, the underlying principles of privy construction, the earth-pit privy, types of earth-pit privies that satisfy the minimum specifications, other types of seat risers, the box-can and other types, and appendix (sample ordinance).

412.9 MISCELLANEOUS SPECIFICATIONS FOR STRUCTURAL TIMBERS AND BRIDGES

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for timber cribbing—requirements for grades, preparation, and dimensions of timber and logs; construction methods (foundation, mud sills, face logs or timber, ties, and fastening); filling; and measurement and payment.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Timber Substructures for Water Tank (50,000 and 100,000-gal. capacity). Gives requirements for timber, workmanship, painting, and treating; and drawings showing recommended types and designs.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Wood Bridges and Trestles. Includes plans for open deck pile and framed trestles, multiple story trestles, ballasted deck pile and framed trestles, and overhead wood highway bridge. Shows recommended practice in design, framing, dimensions, etc.

Assn. of American Railroads, Telegraph and Telephone Section, 1-C-4; 1928. Creosoted Pine Plank. Gives requirements for material, dimensions, finish, creosoting, inspection, marking, and warranty.

413. SHOP OR FACTORY LUMBER

U. S. Gov., Federal Specification MM-L-751c; 1942. Lumber and Timber; Softwood. Covers the principal species of softwood grown in the United States; the three classes of softwood lumber and timber—yard lumber, structural material, and factory and shop lumber—and the grades in the current grading rules of the various associations of softwood lumber manufacturers that conform to American Lumber Standards.

413.0 GENERAL ITEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Building for Railroad Purposes: Carpentry and Millwork. Gives requirements for seasoning, species and grades, dressing, treated lumber, termite shields, framing, joists, partitions, and roof framing.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for shop and factory lumber.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for shop or factory lumber.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-

Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and requirements for shop or factory lumber.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R16-39; 1939. Lumber (American Lumber Standards for Softwood Lumber). Factory and Shop Lumber. Lumber graded with reference to its use for doors and sash, or on the basis of characteristics affecting its use for general cut-up purposes, or on the basis of size of cuttings. Gives general provisions; size standards as to thicknesses, widths, and lengths; basic classification for factory plank, qualities and sizes of cuttings, and sizes of sash cuttings. Initiated by Central Committee on Lumber Standards and the National Lumber Manufacturers Assn.

413.1 TANK STOCK LUMBER

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes silo staves, dimensional diagram of stock pattern.

California Redwood Assn. Standard Specifications, 1942. Tank Stock and Silo Staves. Conforms to American Lumber Standards. Gives requirements for Clear All Heart and A Grades, with dimensions.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for tank stock.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and grading rules for tank stock.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS92-41; 1941. Cedar, Cypress, and Redwood Tank-Stock Lumber. This standard provides minimum specifications for one grade of all heartwood tank-stock lumber made of Western red cedar, Port Orford cedar, Southern cypress, and California redwood in the following range of sizes: Thickness, 1/2 to 4 in.; width, 4 to 12 in.; and length, 6 to 32 ft. It also gives allowable characteristics and conditions, tolerances, method of measurement, nomenclature and definitions, and a plan for certification and grade marking. Initiated by Durable Woods Institute and California Redwood Assn., Southern Cypress Manufacturers Assn., and the West Coast Lumbermen's Assn.

U. S. Gov., U. S. Army, Army Air Forces. Specification 82-16; 1935. Lumber; Tank Stock, Redwood, and Southern Cypress.

References.—American Lumber Standards for softwood factory and shop lumber, *see* 413.0; hardwood grading rules, *see* 400.3.

413.2 CAR STOCK LUMBER

413.20 General Items

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Siding, Flooring, Roofing, and Lining Standard. Sections of car lumber, with detailed dimensional drawings for tongued and grooved, square-edged, shiplapped, etc. Requirements as to moisture content, 13 standard sections of lumber.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-907-41; 1941. Lumber. Nomenclature for commercial softwood and hardwood, use classification listings, grading provisions, shipping and inspection, measurement, lengths, car lumber, grading classification. Decription of grades, vertical sheathing and exposed roofing, horizontal sheathing, finish, flooring and sills, battens, facing, lining, running boards and steps, baffle boards, nailing planks and nailing sills, bearers, bolsters, bumpers, planks, ridge poles, purlins, belting, braces, posts, and definitions of terms and defects.

Western Pine Assn. Standard Grading Rules for Ponderosa Pine, Sugar Pine, Idaho White Pine, Larch-Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar Lumber, 1939. Includes official grade, trade, and species marks; general instructions, measurements, and tally; definitions of defects; reinspection; and rules for grading larch and Douglas fir railroad car material.

413.21 Fir Car Stock

References.— Species of lumber recommended for various uses, *see* 413.20; American Lumber Standards for softwood factory and shop lumber, *see* 413.0; hardwood grading rules, *see* 400.3.

413.22 Mahogany Car Stock

References.—*See* references under 413.21.

413.23 Oak Car Stock

References.—Species of lumber recommended for various uses. *see* 413.20; American Lumber Standards for softwood factory and shop lumber, *see* 413.0; hardwood grading rules, *see* 400.3.

413.24 Pine Car Stock

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Grades of Southern Yellow Pine Lumber for Freight Cars and Locomotives, 1934. In accordance with Assn. of American Railroads' recommended practice and conforming to American Lumber Standards. Includes general instructions, grading provisions, shipping and inspection provisions, measurement, sizes, patterns, lengths, grades, description of grades, definitions of terms; and Assn. of American Railroads' car material patterns.

References.—Species of lumber recommended for various uses, *see* 413.20; American Lumber Standards for softwood factory and shop lumber, *see* 413.0; hardwood grading rules, *see* 400.3.

413.25 Spruce Car Stock

References.—*See* references under 413.24.

413.26 Hemlock Car Stock

References.—*See* references under 413.24.

413.29 Miscellaneous Car Stock

National Hardwood Lumber Assn. Standard Specifications for Grades of Hardwoods and Cypress Lumber for Freight Cars and Locomotives, 1940. (In accordance with Assn. of American Railroads Recommended Practice, revised 1933, and conforming to American Lumber Standards.) Includes nomenclature of commercial hardwoods and cypress, use classification, inspection regulations, grading provisions, grading specifications, description of grades, and definitions of terms.

References.—Species of lumber recommended for various uses, *see* 413.20; American Lumber Standards for softwood factory and shop lumber, *see* 413.0; hardwood grading rules, *see* 400.3.

413.3 AIRPLANE STOCK LUMBER

413.31 Softwood Airplane Stock

U. S. Gov., Army Air Forces. Specification 15056-A; 1930. Lumber; Balsa (Ochroma).

U. S. Gov., Army-Navy Aeronautical Specification AN-C-72a-1; 1943. Cedar; Aircraft Port Orford.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-6a-2; 1943. Fir; Aircraft Noble.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-7a-2; 1943. Fir; Aircraft Douglas.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-4a-2; 1943. Hemlock; Aircraft Western.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-16-1; 1943. Pine; Aircraft Eastern White.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-18-1; 1943. Pine; Aircraft Western White.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-19-1; 1943. Pine; Aircraft Sugar.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-6a-2; 1943. Spruce; Aircraft.

413.32 Hardwood Airplane Stock

U. S. Gov., Army Air Forces. Specification 15058-A; 1939. Lumber; Birch.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-17b—1; 1943. Poplar; Aircraft Yellow.

413.4 SHIP STOCK LUMBER

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for ship decking and ship planking.

U. S. Gov., Navy Dept. Specification 39M3; 1944. Mahogany; Tropical American, African, Philippine (Tanguile) for Boat Planking, Decking, and Timbers.

U. S. Gov., Navy Dept. Specification 39P12a; 1941. Pine; Yellow, Long-Leaf (Pinus Palustris); Decking (Ship Use).

U. S. Gov., Navy Dept. Specification 39T1h; 1942. Teak.

References.—American Lumber Standards for softwood factory and shop lumber, *see* 413.0; hardwood grading rules, *see* 400.3.

413.5 STOCK FOR WOODEN HANDLES, FURNITURE, AND VEHICLES

413.50 General Items

Douglas Fir Plywood Assn. Technical Data on Plywood, 1942. Includes section one—plywood manual for engineers and architects; section two—designing with plywood; and section three—preventing condensation in walls and roofs; pamphlet XVI showing recommended types and grades of Douglas fir plywood, grade descriptions and suitable uses for buildings and other structures, sizes and thickness of Douglas fir plywood, and structural data.

The Veneer Assn. Veneers Reference Data on Principal Cabinet Woods. Gives table showing commercial name, botanical name, origin, color range, types of figures available, price range, hardness, and approximate maximum veneer sizes for the various species.

413.51 Handle Stock Lumber

U. S. Gov., U. S. Army, Ordnance Dept. Specification 82-18; 1943. Wood; Birch (For Small Arms).

References.—Handles for agricultural implements and for tools, *see* 428.1, 428.2.

413.52 Veneer and Plywood

American Society for Testing Materials, D 805-44 T, 1944. Methods of Testing Veneer, Plywood, and Other Wood and Wood-Base Materials. Covers scope, test specimen, report, compression parallel or perpendicular to grain, compression at an angle to the grain, static bending, tension, panel shear, plate shear, toughness, Rockwell hardness, and moisture content and specific gravity.

National Hardwood Lumber Assn. Rules for the Measurement and Inspection of Hardwood Lumber, Cypress, Veneers, and Thin Lumber, 1944. Includes regulations for inspection, general instructions for inspection, standard grades, standard inspection, and special inspection for hardwoods for wagon stock, construction work, and ties; tally, measurement, grades, and inspection of cypress; rules for measurement and cutting, and classified grades of veneer, thin lumber, and plywood veneers; national hardwood lumber sales code; and facsimile of bonded certificate. Veneer, thin lumber and plywood portion endorsed by the Veneer Assn.

U. S. Gov., Army Air Forces. Specification 15057-A(1); 1940. Plywood; Planking, Aircraft (2-Ply Diagonal).

U. S. Gov., Army-Navy Aeronautical Specification AN-P-43; 1943. Plywood; Aircraft, Molded (Fluid Pressure).

U. S. Gov., Army-Navy Aeronautical Specification AN-NN-P-511b-2; 1943. Plywood and Veneer; Aircraft Flat Panel.

U. S. Gov., Dept. of Agriculture; Forest Service, Forest Products Laboratory No. 1599; 1944. In cooperation with the University of Wisconsin. Aircraft Veneers in Yellow Birch, Hard Maple, Yellow Poplar, and Sweetgum. Covers certain defects that are not specifically covered in Specification AN-NN-P-511b. Gives requirements for massed minute distortions, bird peck, bird's-eye, black streaks and soot pockets, dog holes, mineral streaks, pitch flecks, ripples, scars, swirls, knots, burls, localized short grain, distinction between burls and localized short grain, black knots, table showing percent of defects, and illustrations.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS35-42; 1942. Plywood

(Hardwood and Eastern Red Cedar). Provides minimum specifications for four standard grades of hardwood plywood made with three different types of bondage having a high, moderate, and low resistance to moisture. It covers tests, standard thicknesses, widths, and lengths; tolerances, workmanship, packing, inspection, and nomenclature and definitions. Initiated by manufacturers now represented by the Hardwood Plywood Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS45-45; 1945. Douglas Fir Plywood (Sixth Edition). These rules cover six grades of moisture-resistant type and eight grades of exterior type Douglas fir plywood; a laminated board for paneling, sheathing, concrete forms, cabinet work, and many other structural and industrial uses. Gives definition, general requirements, tests, table showing standard Douglas fir plywood sizes, size tolerances, inspection, grade marking and certification, nomenclature and definitions, method of ordering, and table showing grade-use classification for Douglas fir plywood. Initiated by Douglas Fir Plywood Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS64-37; 1937. Walnut Veneers. This standard covers minimum specifications for plain and semifigured walnut veneers classified as sliced and half-round, rotary, and quarters, in thicknesses not greater than 1/24 in. It includes cutting yield and quality as governed by manufacturing and natural defects. Initiated by American Walnut Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS122-45; 1945. Western Hemlock Plywood. Covers four grades of moisture-resistant type Western hemlock plywood for paneling, sheathing, cabinet work, and structural and industrial uses. Gives definition, general requirements, detail requirements, tests, size tolerances, inspection, grade marking and certification, nomenclature and definitions, and table showing grade, width, length, and thickness.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, stripwood, and plywood subfloors. Installations on stripwood subfloors were made with underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given, and photographs of the test panels after 48,000 cycles of the testing equipment are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS73; 1941. Indentation Characteristics of Floor Coverings. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65-percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevated temperature of 90° F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedure are briefly described. Summaries of the results are present to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 26 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were cork tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given, and their appearance at the end of the test is shown by photographs. A few generalized comments and conclusions are made.

U. S. Gov., Joint Army-Navy Specification Jan-P-66; 1944. Plywood; Flat Panel.

U. S. Gov., Post Office Dept. Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Wood, Plywood for Panels.

References.—American Lumber Standards for softwood veneer and plywood, *see* 413.0; hardwood grading rules, *see* 400.3.

413.53 Furniture Stock Except Plywood and Veneer

References.—Veneer and plywood, *see* 413.52; American Lumber Standards for softwood furniture stock, *see* 413.0; hardwood grading rules, *see* 400.3; wooden furniture, *see* 430-439.

413.54 Wagon and Vehicle Stock Lumber

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R134-32; 1932. Singletrees, Doubletrees, and Neckyokes. This recommendation establishes a simplified schedule of stock sizes of singletrees, doubletrees, and neckyokes, including dimensions and weights and kind of wood for each type. Initiated by manufacturers now represented by the Farm Equipment Institute.

References.—Railway car stock, *see* 413.2; ship stock, *see* 413.4; American Lumber Standards for softwood shop and factory lumber, *see* 413.0; hardwood grading rules, *see* 400.3.

413.6 PATTERN STOCK LUMBER

California Redwood Assn. Standard Specification, 1940. Rules for grading pattern lumber, in conformity with American Lumber Standards, includes vertical and flat grain requirements for Clear All Heart grades.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and stock patterns.

U. S. Gov., Army Air Forces. Specification 15068-A (1); 1939. Lumber; Mahogany.

U. S. Gov., U. S. Army, Army Air Forces. Specification 82-15; 1935. Lumber; Pattern Pine.

References.—American Lumber Standards for softwood pattern lumber, *see* 413.0; hardwood grading rules, *see* 400.3; pattern colors, *see* 429.9.

413.7 COOPERAGE STOCK LUMBER

References.—Cooperage, *see* 421.

413.8 DOOR, WINDOW, AND MILLWORK LUMBER

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Building for Railroad Purposes: Carpentry and Millwork. Gives requirements for seasoning, species and grades, dressing, treated lumber, termite shields, framing, joists, partitions, and roof framing.

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes bevel and molded sills, wood gutters, plain and molded wall boarding, battens, railings, balusters, and moldings, with dimensional diagrams of stock patterns.

California Redwood Assn. Standard Specification, 1942. Casing and Base, Window and Door Frame Stock, Jambs, Etc. Conforms to American lumber standards. Gives requirements for Clear All Heart, and A and B grades.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for door and window jambs.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; ahd grading rules for Douglas fir, West Coast hemlock, and Sitka spruce cut door stock, sash cuttings, and millwork.

References.—American Lumber Standards for softwood shop and factory lumber, *see* 413.0; hardwood grading rules, *see* 400.3; millwork, *see* 423; molding, casing, baseboard, *see* 411.42; finish and panel stock, *see* 411.43.

413.9 MISCELLANEOUS SHOP AND FACTORY LUMBER

National Safety Council (American Society of Safety Engineers, Engineering Section). American Standards Assn. A14-1935. Safety Code for Construction, Care and Use of Ladders. Definitions of terms, kind and quality of materials; definition of timber defects; requirements and relative dimensions of wood side rails, steps, rungs, treads, and cleats; classification of various species of wood for use in ladders.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No.11; 1942. Includes official trade and grade marks; general instruction; moisture content provisions; definitions; thicknesses and widths; and grading rules for miscellaneous shop and factory lumber.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R59-26; 1926. Rotary-Cut Lumber Stock for Wire-Bound Boxes. This recommendation establishes a simplified list of dimensions for air-and kiln-dried stock produced from gum and pine and other soft woods. Initiated by the Wire-Bound Box Manufacturers Assn.

References.—American Lumber Standards for softwood shop and factory lumber, *see* 413.0; hardwood grading rules, *see* 400.3.

414. RAW CORK, RATTAN AND REED

414.1 CORK

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cork. Covers definition, constants, derivation, grades, uses, marketing, containers, and substitutes.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 16Ye; 1941. Refrigerating Equipment. Includes requirements for corkboard, granulated cork, and molded cork. Includes also ice-making equipment.

U. S. Gov., Navy Dept. Specification 52C7d; 1943. Cork; Ground.

References.—Cork board or compressed cork, *see* 425.2; life preservers of cork, *see* 425.3; cork pipe covering, *see* 707.41.

414.2 RATTAN

414.3 REED

U. S. Gov., Veterans Administration. Specification VA-X-79e; 1942. Reeds.

420-429 MANUFACTURES OF WOOD

(Except Furniture)

421. COOPERAGE, BARRELS, BOXES, AND SHOOKS

421.0 GENERAL ITEMS

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, Undated. General Barrel Information. Covers loading barrels for railroad shipment, tools used for barrels, measurements and capacities, and dictionary of cooperage terms.

References.—Standard fruit and vegetable barrel, standard lime barrel, *see* 951.10.

421.1 TIGHT BARREL STAVES

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, Undated. Beer Barrels. Covers general requirements, care and handling, laminated barrel care, timber, basis of sale, inspections, stave dimensions, and heading sizes.

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, Undated. Tight Barrels. Gives tight barrel diagram and covers selecting the proper barrel for your product, opening and closing a barrel, handling and storing barrels, interstate commerce commission regulations, grade rules and specifications, circled tight barrel heading, square tight barrel heading, specifications for export barrels, and use of linings.

References.—Tight barrel and tub staves, *see* 951.10, 951.13, 951.24, 951.44, 951.72; tank stock lumber, *see* 413.1.

421.2 SLACK BARREL STAVES

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, Undated. Slack Barrels. Gives slack barrel diagram and covers selecting the proper barrel for your product, opening and closing a barrel, handling and storing barrels, interstate commerce commission regulations, grade rules and specifications for export barrels, export barrels for dried skim milk, and bag liners and head liners.

References.—Slack barrel staves, *see* 951.10, 951.13.

421.3 BARREL HEADINGS AND HOOPS

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, Undated. Beer Barrels. Covers general requirements, care and handling, laminated barrel care, timber, basis of sale, inspections, stave dimensions, and heading sizes.

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, Undated. Slack Barrels. Gives slack barrel diagram and covers selecting the proper barrel for your product, opening and closing a barrel, handling and storing barrels, interstate commerce commission regulations, grade rules and specifications for export barrels, export barrels for dried skim milk, and bag liners and head liners.

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, Undated. Tight Barrels. Gives tight barrel diagram and covers selecting the proper barrel for your product, opening and closing a barrel, handling and storing barrels, interstate commerce commission regulations, grade rules and specifications, circled tight barrel heading, square tight barrel heading, specifications for export barrels, and use of linings.

References.—Headings and hoops, *see* 951.10, 951.13, 951.24, 951.44, 951.72; steel hoops, *see* 604.22.

421.4 BOX SHOOKS

References.—Box shook, *see* 953.30, 953.31, 953.33, 953.35, 953.36, 953.39; box lumber, *see* 413.0, 413.9.

421.5 BOXES, BARRELS, CASKS, HOGSHEADS

References.—Barrels, drums, and tubs, *see* 951; wooden boxes, *see* 953.3; wooden crates, *see* 954.3; wooden switch boxes, *see* 715.12.

422. BASKETS

References.—Baskets, *see* 952.

423. MILLWORK

423.0 GENERAL ITEMS

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for millwork.

423.1 WOODEN DOORS

National Door Manufacturers Assn. Manual of Standard Construction, 1940. Pine Garage Doors. Graded in accordance with house door rules, except as to defects in mill-run grade.

National Door Manufacturers Assn. Manual of Standard Construction, 1940. Stock Solid Doors and Frames. Specifications for ponderosa pine material as to quality and moisture content, standard types of door sticking and panels, exterior and interior with dimensional diagrams for eight designs of doors. Available in three quality standards.

National Door Manufacturers Assn. Manual of Standard Construction, 1940. Stock Veneered Doors. Specifications as to laminated pine core interior and exterior doors with option as to face veneer; includes gluing, sanding, stile and rail, number of piles, flush doors, and dimensional diagrams.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for door cuttings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS73-43; 1943. Old Growth Douglas Fir Standard Stock Doors. This standard provides minimum specifications for four grades of stock fir doors in four thicknesses, 3/4, 1 1/8, 1 3/8, and 1 3/4 in. It covers construction, defects, and the grading tolerances for these requirements. General requirements, inspection and labeling, detail requirements, house doors, garage doors, designs and layouts, Douglas fir stock door list, and grade marking. Initiated by Fir Door Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS91-41; 1941. Factory Fitted Douglas Fir Entrance Doors. This standard provides minimum specifications for one grade of factory fitted Douglas fir entrance doors 1 3/4 in. thick. It covers 27 layouts, 25 of which are panel or sash doors and two are flush doors. All doors are available in two sizes, 3 ft. by 6 ft. 8 in. and 3 ft. by 7 ft. It also covers packaging, inspection, nomenclature and definitions, and the method of certification of compliance with this standard. Initiated by Fir Door Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS120-44; 1944. Standard Stock Ponderosa Pine Doors. To establish standard specifications and sizes for ponderosa pine, standard stock doors in four nominal thicknesses, 3/4, 1 1/8, 1 3/8, and 1 3/4 in. Covers general requirements, grading, designs and layouts, inspection, labeling, and nomenclature and definitions.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 27Yb; 1939. Screens. For doors, windows, transoms, and porches.

U. S. Gov., The Panama Canal, Purchasing Dept. Specification for Doors, 1941.

References.—Millwork lumber, *see* 411.4, 413.8, metal doors and tin clad doors, *see* 605.22; softwood and hardwood grading rules, *see* 400.2, 400.3, 413.0.

423.2 SASH

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Wood Screens. Gives requirements for woodwork, hardware, tags, finishing, and kinds of wood.

National Door Manufacturers Assn. Manual of Standard Construction, 1940. Stock Window Frames and Sash. Specifications as to material, moisture content, standard details for frames and sash openings, with dimensional diagrams, and options as to preservative treatment, priming, and glazing.

West Coast Lumbermen's Assn. Standard grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for sash cuttings.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 27Yb; 1939. Screens. For doors, windows, transoms, and porches.

References.—Millwork lumber, *see* 411.4, 413.8; steel windows, *see* 605.22; softwood and hardwood grading rules, *see* 400.2, 400.3, 413.0; definitions of terms, standard practice, *see* 423.0; screen fasteners, *see* 617.43; screen lifts, *see* 617.35; hinges, *see* 617.12.

423.3 SLAT BLINDS

American Hospital Assn., 4-4. Wood Slat Venetian Blinds. Covers free hanging design type with slats adjustable to various angles of three types and sizes and in one grade. Based on U. S. Gov. Federal Specification LLL-B-441, and Amendment 2 for wood slat venetian blinds; T-C-571a and Amendment 1 for cotton braided sash cord; and CCC-T-191a and Amendment 1 for textiles; general specifications; test methods.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS61-37; 1937. Wood-Slat Venetian Blinds. Covers venetian blinds of the free-hanging, tilt-rail type for residence and office use in three widths of slats, 1 3/4, 2, and 2 3/8 in., respectively, with slats adjustable to various angles and with raising, lowering, and tilting actions controlled by cords, chains, or cables. It includes also general requirements covering workmanship and construction of single-pull and compound-pull blinds having three and four tapes; also detail requirements relative to minimum dimensions of rails and slats.

U. S. Gov., Federal Specification LLL-B-441; 1937. Amendment 2; 1941. Blinds; Venetian, Wood-Slat. Covers three types—(I) single pull, (II) compound pull, and (III) operated by oscillating roller lifts. Gives requirements for material, finish, slats, tilt device, ladder tape, cords and cables, and slider side guides; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-LLL-B-441; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for operating devices, hardware, and finish.

References.—Millwork lumber, *see* 411.4, 413.8; softwood and hardwood grading rules, *see* 400.2, 400.3, 413.0; definitions of terms, standard practice, *see* 423.0.

423.4 SLATS

U. S. Gov., Federal Specification LLL-S-256; 1938. Shades, Window; Wood-Slats. Gives requirements for finish and color of wood parts, top and bottom molding, slat dimensions, hardware, cord, and twine; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

423.5 PICKETS AND PALINGS

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes square and flat wooden fence pickets, finish and standard dimensions.

California Redwood Assn. Standard Patterns of Worked Redwood Lumber. Pattern Book 738; 1941. Includes garden, cape cod, colonial, modern, village, gothic, pointed, and concord patterns of picket pack, with dimensional diagrams of stock sizes.

Southern Pine Inspection Bureau of the Southern Pine Assn. Standard Specifications for Southern Pine Lumber, 1939. Includes general instructions, definitions, general grading provisions, specifications, and grading rules for pickets.

West Coast Lumbermen's Assn. Standard Grading and Dressing Rules for Douglas Fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar Lumber, No. 11; 1942. Includes official trade and grade marks; general instructions; moisture content provisions; definitions; thicknesses and widths; and grading rules for pickets.

References.—Softwood and hardwood grading rules, *see* 400.2, 400.3, 413.0; definitions of terms, standard practice, *see* 423.0.

423.9 MISCELLANEOUS MILLWORK SPECIFICATIONS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Carpentry and Millwork. Gives requirements for window and door frames, stairs, cabinets, counters, and sash.

Appalachian Hardwood Manufacturers. Standardized Hardwood Wall Paneling, 1939. Includes standard types of vertical, horizontal, and combination panels, moldings and trim; of white oak, beech, birch, chestnut, and maple; also available in red oak, butternut, and yellow poplar. Dimensional drawings of standard shapes, installation instructions, and illustrations.

Arkansas Soft Pine Bureau. Standard Specifications for Arkansas Soft Pine Lumber, 1939. Includes molded casing and base window and door jambs, and moldings worked to conform to American Lumber Standards' 8000 series, in three grades.

U. S. Gov., Army Air Forces. Specification 15065-A; 1944. Panels; Impregnated Compressed Wood.

U. S. Gov., Dept. of the Treasury, Procurement Div., No. 543; 1942. Fasteners, Wood Joint; Corrugated. Covers two types: I, divergent currugations—class (a) saw edge and class (b) plain edge; and II, parallel corrugations—class (a) saw edge and class (b) plain edge.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1676; 1943. Shelter HO-21-( ), VHF, Plywood Field Shelter.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-14-B; 1941. Shelter; Type ML-41, Meteorological, Instrument.

References.—Millwork lumber, *see* 411.4, 413.8; softwood and hardwood grading rules, *see* 400.2, 400.3, 413.0; definitions of terms, standard practice, *see* 423.0; finish lumber, *see* 411.43.

424. TANKS

References.—Wood tanks, *see* 956.2; metal tanks, *see* 605.23, 956.2.

425. MANUFACTURES OF CORK

425.1 CORK STOPPERS

American Hospital Assn., 16-25. Cork Stoppers. Covers two types (uncemented and cemented), four grades, and four classes (short-length, regular-length, extra-long, and extra-extra-long). Based on U. S. Gov., Federal Specification LLL-S-731 for Cork Stoppers.

U. S. Gov., Federal Specification LLL-S-731; 1935. Stoppers; Cork. Covers two types—(I) uncemented, and (II) cemented; four grades—A, B, C, and D; and four classes—(1) short length, (2) regular length, (3) extra long, (4) extra, extra long. Gives requirements for sizes, dimensions, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

425.2 CORK BOARD, COMPRESSED CORK

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 4.0; 1941. Miscellaneous Ammonia Standards. (4.4) Cold Storage Room Insulation. Gives recommended thicknesses of insulation for certain required temperatures, including cork.

American Assn. of State Highway Officials, M58-42. Standard Specifications for Preformed Expansion Joint Fillers for Concrete (Cork, Self-Expanding Cork, Sponge Rubber and Cork-Rubber Types). Gives scope, manufacture, character of strips, properties, dimensions and permissible variations, packing, sampling, and methods of testing.

American Public Works Assn. Specification for Portland Cement Concrete Pavement, F1-39; 1939. Gives requirements for premolded cork expansion joint formed from clean cork particles compressed and bound together with a cementing material insoluble in water. Includes weight, boiling, compression, and recovery tests.

American Society for Testing Materials, D 544-41; 1941. Preformed Expansion Joint Fillers for Concrete (Nonextruding and Resilient Types). Includes cork, self-expanding cork, sponge rubber, and cork rubber. Manufacture, character of strips, properties, dimensions and permissible variations, packing, sampling, and methods of testing.

American Society for Testing Materials, D-545-41; 1941. Methods of Testing Preformed Expansion Joint Fillers for Concrete (Nonextruding and Resilient Types). Procedures covering tests for expansion in boiler water, recovery, compression, extrusion, boiling in hydrochloric acid, and weathering.

U. S. Gov., Federal Specification HH-C-561b; 1941. Cork; Compressed (Corkboard) (for Thermal Insulation). Covers one grade. Gives requirements for tolerances, modulus of rupture, thermal conductivity, finish, and width; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-C-576; 1936. Amendment 1; 1937. Cork Composition; Gasket and Sheet. Covers four classes—(1) light, (2) medium light, (3) medium heavy, and (4) heavy compositions. Gives requirements for physical properties, tolerances, and flexibility; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-F-341; 1940. Filler, Expansion-Joint, Preformed, Nonextruding and Resilient Types (for Concrete). Covers four types—(I) cork, (II) sponge rubber, (III) self-expanding cork, and (IV) cork rubber. Gives requirements for materials, recovery, compression, extrusion, and expansion; methods of sampling and testing; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 16Ye; 1941. Refrigerating Equipment. Also includes ice-making equipment. Includes requirements for corkboard, granulated cork, and molded cork.

U. S. Gov., Navy Dept. Specification 32C13; 1934. Cork-Composition; for Bulletin Boards.

U. S. Gov., Navy Dept. Specification 33C5; 1935. Cork-Composition; Gasket and Sheet.

U. S. Gov., Navy Dept. Specification 39C7a; 1940. Cork, Sheet; for Ring Life Buoys.

U. S. Gov., U. S. Army, Army Air Forces. Specification 23-30; 1926. Cork, Sheet; for Gaskets.

References.—Ground cork, *see* 414.1.

425.3 LIFE PRESERVERS, BELTS, AND BUOY RINGS OF CORK

U. S. Gov., Navy Dept. Specification 23B4; 1944. Buoys, Life; Ring, Cork.

References.—Ground cork, compressed cork, *see* 414.1, 425.2; balsa wood life buoy, *see* 429.9.

425.4 CORK PIPE COVERINGS

U. S. Gov., Federal Specification HH-P-381; 1934. Pipe-Covering; Cork, Molded. Covers three classes—(A) ice water thickness; (B) brine thickness; and (C) special brine thickness. Gives requirements for material and workmanship, fits, molded fitting covering, segments, density, thickness, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-HH-P-381; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) eliminated the use of cork and substituted Federal Specifications HH-I-521B (Insulation; Bat or Strip Form and Loose-Fill); HH-I-556 (Insulation-Glass Fiber, Semi-Rigid); E-HH-I-571 (Insulation—Vegetable or Wood Fiber, Blanket, Felt and Loose-Fill); HH-I-578 (Insulation, Vermiculite, Block and Pipe-Covering); HH-M-371 (Mineral Wool, Impregnated; Blanket, Block and Pipe-Covering-Molded, for Low Temperatures), or C-F-201A (Felt, hair).

References.—Cork pipe covering, *see* 707.41; ground cork, compressed cork, *see* 414.1, 425.2.

425.5 CORK, GRANULATED

U. S. Gov., Federal Specification HH-C-571a, 1933. Cork; Granulated, Insulating. Covers one grade. Gives requirements for material, sizes, and color; and methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

425.6 CORK, CARPET AND TILE

U. S. Gov., Federal Specification LLL-C-96; 1939. Carpet; Cork. Covers one type and grade. Gives requirements for material, color and surface, tolerances, width, thickness, seasoning, burlap backing, key, finish, weight, and pliability; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification LLL-T-431; 1937. Tile; Cork. Covers one type and grade. Gives requirements for material, color, finish, tolerances, size, thickness, weight, indentation and recovery, and ash content; sampling, inspection, and tests; and packing and marking.

425.9 MISCELLANEOUS CORK ITEMS

Society of Automotive Engineers, Aeronautical Material Specification 3250; 1944. Synthetic Rubber and Cork Composition, General Purpose (35-45). For sheet, strip, molded shapes or as ordered. Gives requirements for application, quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers, Aeronautical Material Specification 3251; 1944. Synthetic Rubber and Cork Composition, General Purpose (45-55). For sheet, strip, molded shapes or as ordered. Gives requirements for application, quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

Society of Automotive Engineers, Aeronautical Material Specification 3252; 1944. Synthetic Rubber and Cork Composition, General Purpose (55-65). For sheet, strip, molded shapes or as ordered. Gives requirements for application, quality, requirements, sampling, tolerances, reports, identification, packaging, approval, and rejections.

426. VEHICLES

References.—Wagon stock, *see* 413.54; locomotives, *see* 701.3, 721.1; automobiles and trucks, *see* 721.2, 722, 723; aircraft, *see* 724; bicycles, motocycles, *see* 725.1, 725.2; boats, ships, *see* 725.3, 725.4; railway cars, *see* 726; trucks, other than motor trucks, *see* 729.3.

427. ELECTRICAL EQUIPMENT OF WOOD

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Part of this specification relates to material used principally in direct suspension overhead trolley construction, for voltages not exceeding 750 volts. It covers requirements for bracket arms, pole bands, bolts, bracket intermediate fittings, crossings, clinch ears, frogs, insulators, etc.

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Wood for insulator pins referred to in this specification shall conform to the current specification D150 for Wood Insulator Pins (Material) of the Edison Electric Institute.

Association of American Railroads, Telegraph and Telephone Section, 1-A-86; 1942. Deadman. For use in the communication plant. Gives general requirements, material and workmanship, dimensions, identification, inspection and tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-87; 1942. Pike Poles. For use in the communication plant. Gives general requirements, material and workmanship, dimensions, identification, inspection and tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-94; 1943. Locust Wood Bushings. For use in the communication plant. Gives general requirements, material and workmanship, dimensions, definition of terms, inspection and tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 1-C-3; 1928. Creosoted Wood Conduit. For conduit of Southern yellow pine, Norway pine, black gum, permissible defects in wood, range in length of one size square conduit with circular bore, dimensions of tenons and mortises, retention of preservative, creosoting according to Specification 1-A-10.

Assn. of American Railroads, Telegraph and Telephone Section, 1-C-11; 1941. Split Single Creosoted Yellow Pine Conduit. For use in underground construction. Gives material, workmanship, dimensions, assembly, finish, creosoting, inspection and tests, marking, and warranty.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-334B; 1933. Rod, Duct; Type LC-43, 3-Foot Lengths.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-458A; 1935. Conduit; Types MC-78 and MC-94-A, Wood, Creosoted.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-476A; 1943. Wire Pike MC-1.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-635A; 1943. Wire Pipe MC-123; Sectional.

References.—Wooden insulators and insulator pins, *see* 429.7; wooden poles, cross arms, *see* 401.3, 402.1.

428. WOODEN HANDLES, OARS, TENT PINS, AND POLES

428.1 HANDLES FOR AGRICULTURAL IMPLEMENTS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R76-40; 1940. Ash Handles. This recommendation establishes standard grading of long handles and stems for forks, rakes, hoes, and kindred farm and garden tools, as well as for shovels, spades, and scoops. And also covers requirements on color, weight, number of annual rings, maximum permissible cross grain, and admissible blemishes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R77-39; 1939. Hickory Handles. This recommendation establishes a standard grading of long and short handles for striking tools, such as axes, adzes, picks, sledges, hammers, hatchets, etc. It also covers requirements of color of wood, number of annual rings, weight, admissible blemishes and defects. Initiated by the Hickory Handle Assn.

U. S. Gov., Federal Specification NN-H-81; 1934. Handles; Ash, for Tools. Covers four types—fork, hoe, rake, and shovel; and three grades—XX, X, and 1. Gives requirements for material and workmanship; methods of inspection; and requirements for packaging, packing, and marking.

428.2 WOODEN HANDLES FOR TOOLS

428.20 General Items

428.21 Broom, Mop, and Brush Handles

References.—Brooms and broom-handles, *see* 981; brushes and brush handles, *see* 982; mopsticks, *see* 983.1.

428.22 Package Handles

428.29 Miscellaneous Tool Handles

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Hickory Handles for Track Tools. Gives requirements for material, physical characteristics, design, manufacture, inspection, definitions of blemishes and defects, delivery, grade classification, and use of classification.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-171-S. Handles; Ash, Tool.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-172. Handles; Double-Bit Ax.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-173-1-S. Handles; Hickory, Long.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-173-2-S. Handles; Hickory, Short.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 174, Handles; Crosscut Saw.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H5; 1923. American Standards Assn., B13-1924. American Logging and Sawmill Safety Code. Requirements on structural features, provision of guards, and rules of operation and procedure, which increase safety for employees, covering felling and logging, sawmill operations, sawmill machinery, and yard operations.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R77-39; 1939. Hickory Handles. This recommendation establishes a standard grading of long and short handles for striking tools, such as axes, adzes, picks, sledges, hammers, hatchets, etc. It also covers requirements of color of wood, number of annual rings, weight, admissible blemishes and defects. Initiated by Hickory Handle Assn.

U. S. Gov., Federal Specification NN-H-93; 1941. Amendment 1; 1944. Handles; Hickory, Striking-Tool. Covers ten types, sledge hammer, riveting hammer, single-bitted ax, double bitted ax, adz eye hammer, adz, railroad or clay pick, blacksmith hammer, hatchet, and machinist hammer; and three grades, AA, A, and B. Gives requirements for materials and workmanship, and details for each type; methods of inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification NN-H-106; 1934. Amendment 2; 1944. Handles; Wood, Miscellaneous for Tools. Covers six types—ship auger, bung borer, chisel (socket firmer), file, saw, and soldering iron. Gives requirements for material and workmanship, finish, tolerances, and details for each type; methods of inspection; and packaging, packing, and marking.

References.—Standard sizes, *see* 428,20.

428.3 OARS AND PADDLES

U. S. Gov., Joint Army-Navy Specification JAN-O-39; 1944. Oars.

U. S. Gov., Joint Army-Navy Specification JAN-P-40; 1944. Paddles; Boat and Life Float.

428.4 TENT PINS AND POLES

429. MISCELLANEOUS MANUFACTURES OF WOOD

429.1 WOODENWARE (DISHES AND KITCHEN UTENSILS)

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R189-42. Round and Flat Hardwood Toothpicks (Sizes and Packaging). This recommendation gives tables showing minimum number of cartons or cans per shipping unit, number of toothpicks per carton or can, and length of toothpicks for both round and flat hardwood toothpicks.

U. S. Gov., Federal Specification LLL-B-551; 1939. Boards; Bread and Pastry. Covers one grade. Gives requirements for material, construction, glue, finish, shape, dimensions, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-B-561; 1939. Amendment 1; 1943. Boards; Carving. Covers one grade. Gives requirements for material, construction, glue, glued joints, dimensions, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification LLL-B-568; 1939. Boards; Chopping. Covers one grade. Gives requirements for material, construction, glue, shapes, sizes, tolerances, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-B-576; 1941. Boards; Pantry, Wood. Covers one grade. Gives requirements for material, construction, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-M-116; 1941. Mashers; Potato, Wood. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-P-381; 1941. Pins; Rolling, Wood. Covers one grade and two types—(I) with stationary handles, and (II) with revolving handles. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-S-614; 1941. Spoons; Mixing, Wood. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-S-617; 1941. Spoons: Mustard, Wood. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 64B5d; 1941. Blocks; Meat, Tables, Cutting Meat.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-1; 1941. Spoons; Wood, Mixing. There shall be but one type and grade, and sizes shall be 12 or 15 in. overall. Gives requirements for materials, workmanship, dimensions, tolerance, construction, finish, methods of inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-4; 1941. Paddles; Stirring, Wooden. There shall be but one type and grade. Gives requirements for material, workmanship, blades, handle, finish, dimensions, tolerance, inspection, and method of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-6; 1941. Boards; Bread or Pastry, Meat Cutting or Carving, Wooden. Type I—Bread or pastry boards; type II—meat cutting or carving boards; and shall be but one grade. Gives requirements for materials, workmanship, construction, sizes, tolerance, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-15; 1941. Bowls; Chopping, Wooden. All bowls shall be of the round type, with a flat on outside of bottom, and shall be of but one grade. Gives requirements for material, workmanship, construction, dimensions, tolerance, inspection, and test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-17; 1941. Peels; (Cracker) Wooden. There shall be but one grade and type. Gives requirements for material, workmanship, blade, handle, length, sampling, inspection, and test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-19a; 1944. Pins; Rolling, Wood. Covers one grade and two types—(I) rolling pin with handle, and (II) baker's pie roll. Gives requirements for materials, workmanship, construction, wood, finish, and details for each type including sizes; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

429.2 WOODEN TOOLS

U. S. Gov., Federal Specification LLL-M-71; 1933. Amendment 3; 1942. Mallets and Mauls; Wood. Covers seven types—(I) mallets, calking; (II) mallets, carpenters', round, round reinforced-head, and square; (III) mallets, coppersmiths'; (IV) mallets, hawsing (beetles); (V) mallets, serving; (VI) mallets, tinners'; and (VII) mauls. Gives requirements for material, construction, handles. finish, and dimentions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification. Revised, 1939. Lasts, Hinge, Marine Corps Shoes (Goodyear Welt).

U. S. Gov., Navy Dept. Specification 41S24a; 1927. Sticks; Packing.

U. S. Gov., Navy Dept. Specification 41W1b; 1936. Wedges.

U. S. Gov., Navy Dept. Specification 72L3; 1943. Lasts; Shoe.

U. S. Gov., Treasury Dept., Procurement Div., 453a; 1942. Mallets, Tamping-Bars, and Wedges, Wood (for Use in Blasting Operations). Covers 3 types—(I) wood mallets; (II) tamping-bars, wood; (III) wedges, wood. Gives requirements for wood, head, handle, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-193; 1939. Screw; Hand.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-83; 1925. Last, Hinge, Munson, Goodyear Welt.

References.—Metal hand tools, *see* 615, 616.

429.3 WOODEN POLE BRACKETS AND STEPS

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-35; 1930. Wood Pole Steps. For steps made from seasoned oak to be secured to poles, allowable sapwood, knots, and defects, with dimensional drawing.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-36; 1936. Wood Pole Brackets. For brackets of seasoned oak for mounting glass insulators, requirements for angle of grain, knots, sapwood, and defects, with dimensional drawings.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-314B; 1943. Brackets PF-57 and PF-58.

References.—Steel brackets and steps, *see* 719.62.

429.4 WOODEN LADDERS

American Hospital Assn., 34-97. Ladders and Ladder Shoes (Extension, Sectional, and Straight). Covers two and three-section extension ladders; interchangeable section-lock, nut type sectional ladders; and window cleaners' type sectional ladders. Based on U. S. Gov., Federal Specification LLL-L-51 for

(Extension, Sectional, and Straight) Ladders and Ladder Shoes.

American Hospital Assn., 34-100. Stepladders. Covers mechanics' type, 4 to 20 ft., and general purpose type, 3 to 12 ft. Based on U. S. Gov., Federal Specification LLL-L-61 for Stepladders.

National Safety Council (American Society of Safety Engineers, Engineering Section). American Standards Assn., A14-1935. Safety Code for Construction, Care, and Use of Ladders. Definitions of terms, kind and quality of materials; definition of timber defects; requirements and relative dimensions of wood side rails, steps, rungs, treads and cleats; classification of various species of wood for use in ladders; specifications and construction of fixed, single, extension, fire, step, trolley and side-rolling, sectional, trestle and extension trestle ladders; installation of fixed ladders; accessories; care and use.

National Safety Council. American Standards Assn., A 39-1933. Recommended Practice for Window Cleaning. Applies to all window cleaning operations performed wholly or partially c the outside of all public buildings more than one story high, or in which the sills of windows are located more than 10 ft. above grade or adjoining roof. Requirements when to use approved safety devices. Requirements on swinging scaffolds, boatswain's chair, sectional ladders, belts, belt terminals and anchors.

Underwriters' Laboratories, Inc. Standard for Ladders, 1942. Covers portable ladders of the following types: Straight (single), extension, step, trestle, and extension trestle. Gives requirements for timber defects, knots, pitch pockets, classification of woods (four groups), side rails, steps, construction, strength tests, stability tests, marking, inspection of listed products, and instructions to inspectors.

U. S. Gov., Army Air Forces. Specification 40869; 1944. Ladder; Folding Refueling, Type B-1.

U. S. Gov., Army Air Forces. Specification 40917; 1945. Ladder; Folding Refueling, Type B-2 (Portable by Air).

U. S. Gov., Federal Specification LLL-L-51; 1938. Ladders (Extension, Sectional, and Straight); and Ladder-Shoes. Covers four classes. Gives requirements for design, dimensions, and general construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-LLL-L-51, Jan. 1943 (issued by Procurement Div., Treasury Dept., U. S. Gov.), changed requirements to include metal, wood, and rope.

U. S. Gov., Federal Specification LLL-L-61; 1933. Amendment 1; 1945. Ladders; Step. Covers two types—(I) mechanics', 6 to 16 ft., and (II) general purpose, 4 to 10 ft. Gives requirements for material and workmanship, side rails, back rails, steps, rail spreaders, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40735; 1944. Ladder; Extension Maintenance, Type A-1 (Mounted on Dolly).

U. S. Gov., Veterans Administration. Specification VA-M-164; 1936. Trussed Ladders of the Extension Type.

U. S. Gov., Veterans Administration. Specification VA-M-165a; 1938. Solid Side Wall Ladders.

U. S. Gov., Veterans Administration. Specification VA-M-174; 1936. Extension Ladders.

References.—Ladder stock, *see* 413.9; construction of ladders for mines, *see* 751.

429.5 WOODEN ROLLERS

429.7 WOODEN INSULATORS AND INSULATOR PINS

American Transit Assn. Specifications for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Part of this specification covers material used in feeder cable construction for voltages not exceeding 750 volts. Requirements are given for cross-arm braces, wood insulator brackets, wood cross-arms, tree and cable guards, feeder insulators, insulator pins, and switch boxes.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-56; 1935. Ten-Wire Fanning Strip, AAR-1-A. Covers maple separator treated with beeswax and paraffin, with dimensional requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-84; 1942. Wood Insulator Pins. For use in the communication plant. Gives general requirements, material and workmanship, dimensions, treatment, definitions, inspection and tests, packing, marking, and warranty.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-243; 1923. Insulator; Type IN-53, Line Construction, Wooden.

U. S. Gov., U. S. Army, Singal Corps. Specification 71-315A; 1941. Pins PF-59 and PF-60; Telephone Insulator.

References.—Thread Gages for Insulator Pins, *see* 615.82.

429.8 WOODEN WHEELS

References.—Wood spoke automobile wheels, *see* 722.35; wagon wheel stock, *see* 413.54.

429.9 MANUFACTURES OF WOOD NOT ELSEWHERE CLASSIFIED

American Assn. of State Highway Officials, M90-42. Standard Specifications for Redwood Board Expansion Joint Filler for Concrete. Gives scope, general requirements, dimensions, weight per cubic foot, compression, sampling, and methods of testing.

American Bowling Congress. Rules and Regulations, 1944-45. Covers dimension and weight of pins; weight, size, and balance of balls; construction of kickbacks; specifications for gutters, and legal dimensions of alleys.

American Society for Testing Materials, D 358-44T; 1944. Tentative Specifications for Wood To Be Used as Panels in Weathering Tests of Paints and Varnishes. For exterior paints and other materials for similar purpose, either outdoor or accelerated laboratory tests, and for uses of each specie. Includes Western red cedar, white pine, and Southern yellow pine.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-30; 1929. Wood Booth for Roadway Telephone. General design and dimensional drawings of booth, exterior woodwork and trim of cypress, interior of pine, with asphalt shingle roof. Gives thickness of sheathing, flooring, and door, and requirements for painting.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-31; 1929. Telephone Shelter Box—Type A. For box of white pine, requirements on thickness and type of boards, grade of tin roof, construction of door, and dimensional drawings, including pole mounting details.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-42; 1930. Telephone Shelter Box. Covers typical pole mounted box with extended tin roof for housing telephone equipment, constructed of white pine, train order compartment, and dimensional drawing.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-54; 1935. Cable Boxes. Includes cable boxes for 12 pairs to and including 90 pairs, requirements for cypress wood construction, hardware, and painting, gage of zinc roof, and dimensional drawings of each box.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Excelsior. Covers definition, derivation, uses, marketing, and grades.

National Collegiate Athletic Assn. Official Ice Hockey Guide IH45. Hockey Sticks. Includes requirements for material, length, blade heights, and blade length.

U. S. Gov., Army Air Forces. Specification 40825-2; 1945. Bench; Instrument Repair.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 49. Board; Lookout Map, Wood.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 56. Board; Pack, Canvas-Lined.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-55. Board; Pack, Clack.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H5; 1923. American Standards Assn., B13-1924. American Logging and Sawmill Safety Code. Includes axe handles, requirements on general quality and grain of hickory handles, permissible defects, permissible variations from specified dimensions, number of annual rings. Includes also flume construction. Permissible maximum spacing of supporting posts, minimum size of posts, minimum size of runway, requirements on material of runway and provision of handrail.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R188-42; 1942. Spring and Slotted Clothespins. Covers standard packaging and dimensions of clothespins—three packings for each type.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS18-29; 1929. Hickory Golf Shafts. A commercial standard selected and accepted by industry for "B" form shafts for iron-headed clubs, including requirements on general quality of wood, permissible moisture content, dimensions and tolerances, straightness, straightness of grain, stiffness requirement for each of 3 grades, test method.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS19-32; 1932. American Standards Assn., B45.1-1932. Foundry Patterns of Wood. Pattern colors selected and accepted by industry as a commercial standard covering colors for unfinished surfaces, machined surfaces, core prints, etc. Same as standard pattern colors sponsored by American Foundrymen's Assn. and other organizations.

U. S. Gov., Federal Specification GG-B-546; 1943. Boards; Drawing. Type I, boards with end cleats; type II, boards with back cleats; and sizes shall conform to tables I and II as specified. Gives requirements for trueness, tolerances, finish, construction, dimensions, sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., Federal Specification NN-E-911; 1937. Excelsior (Wood). Covers two types—(I) excelsior, and (II) excelsior pads; two classes—A and B; five grades for type I, class A—superfine wood wool, wood wool, extra fine excelsior, fine excelsior, and course or ribbon excelsior; and five grades for type I, class B—wood wool, extra fine or 4X excelsior, fine excelsior, medium excelsior, and course or ribbon excelsior. Gives requirements for materials, workmanship, sizes of strands, weights of type II, and covering for type II; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-B-621; 1941. Amendment 1; 1942. Bowls; Wood. Covers one grade and two types—(I) oval, and (II) round. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification. Adopted, 1940. Baton; Drum Major.

U. S. Gov., Marine Corps Specification. Adopted, 1934. Drumstick.

U. S. Gov., Navy Dept. Specification 26H1c; 1934. Hangers; Coat.

U. S. Gov., Navy Dept. Specification 26H2b; 1932. Hanger; Trousers.

U. S. Gov., Navy Dept. Specification 39W2; 1944. Wood; Impregnated, Compressed (for Floor Supports in Magazine and Cold-Storage Spaces).

U. S. Gov., U. S. Maritime Commission. Specification 23-MC-2; 1943. Position Buoy Outfit; Fog. Shall be but one type and grade. Gives requirements for metal, wood, workmanship, component parts, buoy, tow line, windlass, finish, marking, sampling, inspection, test, and drawings.

U. S. Gov., U. S. Army, Ordnance Department. Specification 23-68A; 1934. Buoy; Mine.

U. S. Gov., U. S. Army, Ordnance Department. Specification 89-3021; 1940. Plug; Wooden, for Submarine Mines and Buoys.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-2C; 1942. Stirrup, Hooded; and Stirrup, Hooded, With Guidon Socket, for McClellan Saddle.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-82A; 1936. Stretcher; Shoe.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-104A; 1940. Flagstaff.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-108; 1942. Snowshoes; Trial.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-23; 1944. Batons; Band Leader.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-35; 1937. Tree; Saddle, McClellan, M1904, Without Cover, for McClellan Saddles, M1904 and M1928.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-15; 1923. Support; Type ML-42 Meteorological Instrument Shelter.

References.—Turpentine, *see* 211.1; rosin, *see* 216; softwood grading rules, hardwood grading rules, *see* 400.2, 400.3; battery cases, wooden, *see* 954.29; wooden dummy plug for telephone switchboards, *see* 718.29; medicine chest, wood, *see* 915.43; fire hose racks, wood, *see* 974.3; brooms, brushes, mops, *see* 981, 982, 983; matches, *see* 991; wooden seats for water closet bowls, *see* 523.23.

430-439 FURNITURE OF WOOD

431. HOUSEHOLD FURNITURE, EXCEPT CHAIRS

431.1 BEDROOM FURNITURE OF WOOD

431.11 Wooden Beds

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R2-32; 1932. Bedsteads, Springs, and Mattresses. Bedsteads. This recommendation establishes a schedule of types and sizes of bedsteads covering straight-foot wood and metal beds. Initiated by the National Assn. of Bedding Manufacturers and the National Assn. of Furniture Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R2-32; 1932. Bedsteads, Springs, and Mattresses. Mattresses. This recommendation establishes a schedule of types and sizes of mattresses to conform to spring dimensions given in the simplified practice recommendation.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2528; 1939. Shoe; Bed.

References.—Veneer, plywood, and other furniture stock, *see* 413.52, 413.53; metal beds, *see* 613.1.

431.12 Bureaus and Chiffoniers

References.—Plate glass mirrors, *see* 527.

431.13 Cots

U. S. Gov., Federal Specification AA-C-571a; 1937. Amendment 1; 1938. Cots; Folding, Canvas. Covers one type and one grade. Gives requirements for length, width, height, woodwork (hickory, birch, rock elm, white ash, beech, red oak, white oak, pecan or hard maple), steelwork, painting, cover, thread, stitching, and straps; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Metal frame cots, *see* 613.1.

431.14 Wardrobes

U. S. Gov., Federal Specification AA-W-131; 1935. Wardrobes; Wood. Covers two types—(I) double-door, and (II) single-door; and three classes—(A) mahogany finish; (B) oak, quartered, front and sides; and (C) walnut finish. Gives requirements for material, workmanship, and construction; methods of sampling and inspection; and requirements for packaging, packing, and marking.

431.19 Miscellaneous Bedroom Furniture of Wood

431.2 NURSERY FURNITURE OF WOOD

431.3 BATHROOM FURNITURE OF WOOD

References.—Plate glass mirrors, *see* 527.

431.4 DINING-ROOM FURNITURE

U. S. Gov., U. S. Army, Medical Dept. Specification 32-23A; 1942. Table; Dining, Extension, Oak.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-35; 1938. Table; Dining, Cafeteria.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-25A; 1942. Table; Mess.

U. S. Gov., Veterans Administration. Specification VA-G-54b; 1938. Breakfast Suite.

References.—Plate glass mirrors, *sec* 527.

431.5 KITCHEN FURNITURE

431.51 Kitchen Tables

U. S. Gov., U. S. Army, Medical Dept. Specification 32-40; 1939. Table; Kitchen.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-94A; 1941. Table; Kitchen 33 x 114 x 43 in.

U. S. Gov., Veterans Administration. Specification Va-GC-108e; 1942. Wood Cooks' Tables and Bakers' Tables.

U. S. Gov., Veterans Administration. Specification VA-GC-130g; 1942. Table; Soiled and Clean Dish, With Sink Galvanized Iron or Steel.

431.52 Refrigerators

References.—Refrigerators, *see* 959.4.

431.53 Kitchen Cabinets

U. S. Gov., Veterans Administration. Specification VA-GC-360; 1942. Kitchen Cabinets.

431.6 LIBRARY FURNITURE OF WOOD

431.61 Wooden Bookcases

431.62 Library Tables

U. S. Gov., Veterans Administration. Specification VA-G-82; 1932. Library Table; or Center, With Shelf, No. 530.

U. S. Gov., Veterans Administration. Specification VA-G-83; 1932. Library Table; Without Shelf, No. 530-A.

U. S. Gov., Veterans Administration. Specification VA-G-84a; 1934. Library Tables; or Center, With Shelf, No. 533.

U. S. Gov., Veterans Administration. Specification VA-G-89a; 1936. Table; 36 In. Top, No. 537.

U. S. Gov., Veterans Administration. Specification VA-G-157-a; 1937. N. P. Library Tables; 96 In. Long.

U. S. Gov., Veterans Administration. Specification VA-G-287; 1937. N. P. Library Tables; 72 In. Long.

U. S. Gov., Veterans Administration. Specification VA-G-302c; 1943. Table; Library, Round.

431.69 Miscellaneous Wooden Library Furniture

U. S. Gov., Veterans Administration. Specification VA-G-93b; 1939. Periodical Rack.

U. S. Gov., Veterans Administration. Specification VA-G-275; 1937. Small Magazine Racks.

U. S. Gov., Veterans Administration. Specification VA-G-335; 1939. Periodical Rack.

U. S. Gov., Veterans Administration. Specification VA-G-354; 1941. Newspaper Rack; Pedestal Type.

431.9 MISCELLANEOUS HOUSEHOLD FURNITURE OF WOOD

U. S. Gov., Federal Specification AA-S-256; 1935. Settees; Wood. Covers one type and five classes—(A) genuine mahogany, (B) imitation mahogany, (C) quartered oak, (D) genuine walnut, and (E) American walnut, imitation. Gives requirements for material, workmanship, size, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 26-MC-7; 1941. Table; Card, Folding, Wood. Shall be but one type, grade, and size. Gives requirements for wood, plywood, artificial leather, padding, hardwware and fittings, workmanship, sizes, frame, legs, top, finish, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-31; 1941. Mattresses; Excelsior. Shall be but one type and grade. Gives requirements for excelsior, ticking, thread, tufting tape or twine, workmanship, case, seams, size, weight, sampling, inspection, and tests.

References.—Chairs, *see* 438., 435.2; plate glass mirrors, *see* 527.

432. LAWN AND PORCH FURNITURE

433. CAMP FURNITURE

433.1 FOLDING CAMP COTS

References.—Folding canvas cot, *see* 431.13.

433.2 FOLDING TABLES

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 341-1-S. Table; Folding, Fire-Camp, Lightweight.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 341-2-S. Table; Folding, Fire-Camp, Mediumweight.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 342-1-S. Tables; Folding, Camp-Boss.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 343-S. Table; Top, Canvas, Roll-Up.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 344. Table-Top Ration Box.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-38; 1939. Table; Dining, Field, Knock-Down Type.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-22A; 1943. Table; Camp, Folding.

434. HOSPITAL FURNITURE OF WOOD

American Hospital Assn., 52-4. Motorless Dental Operating Chairs. Covers one type and one grade. Based on U. S. Gov., Federal Specifications AA-C-326 and Amendment 1 for Motorless Dental Operating Chairs, and KK-L-291 and Amendment 1 for Upholstery Leather.

American Hospital Assn., 70-4. Invalid Wheel Chairs. Covers two types and one grade. Based on U. S. Gov. Federal Specifications AA-C-346a for Invalid Wheel Chairs, and American Hospital Assn. Specifications 73-19 for Ball Bearing Rubber Tired Wheels, 26 In. Diameter; and Casters having 10-In. Diameter Ball Bearing, Rubber Tired Wheels; for Wheel Chairs.

U. S. Gov., Federal Specification AA-C-346a; 1938. Chairs; Wheel, Invalid. Covers two types—(I) cane seat and cane back, and (II) solid seat and slat back. Gives requirements for back, seat, leg rests, foot boards, under frame, journals, fork and pin, axles, front wheels, rear wheels, hand rims, arm rests, finish, and over-all dimensions; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

References.—Metal hospital beds and cots, *see* 613.1.

435. OFFICE FURNITURE OF WOOD

435.1 WOODEN BOOKCASES

References.—Bookcase sections, *see* 435.5.

435.2 WOODEN OFFICE CHAIRS AND STOOLS

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-146. Console and Desk Chair; Central Station Control.

U. S. Gov., Federal Specification AA-C-281; 1937. Chairs; Bent-Wood. Covers two types—(I) with arms, in two classes (padded seat, plywood seat), and (II) without arms, in three classes (padded seat, plywood seat, wood seat). Gives general requirements for material and workmanship, glue, glued joints, framing, finish, and color; detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification AA-C-311; 1933. Amendment 1; 1937. Chairs; Office, Wood. Covers ten types—(A) rotary, arm chair, No. 1-C; (B) leg, arm chair, No. 2-C; (C) rotary chairs, without arms, No. 3-C; (D) leg chairs, without arms, No. 4-C; (E) rotary chair, No. 5-C; (F) judge's rotary chair, No. 6-C; (G) rotary stool, with back, No. 7-C; (H) rotary stool, without back, No. 8-C; (I) rotary chair, No. 1026; and (J) alternates for No. 1-C and No. 2-C may have perforated leather seats properly reinforced. Gives requirements for design, material, and workmanship; construction, unholstery, hardware, finish, and color; method of inspection; and requirements for packing and marking.

U. S. Gov., Federal Specification AA-S-691; 1943. Stools; Foot. Covers one type and two classes—A, metal and B, wood. Gives requirements for material, workmanship, dimensions, frame, top, legs, rubber tips, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification AA-S-701; 1937. Stools; Wood. Covers three types—(I) leg (in two classes—(A) bent-wood, cane seat, and (B) wood, wood seat); (II) rotary, with back; and (III) rotary, without back, wood (in two classes—(A) cane seat, and (B) wood seat); and woods and finishes—mahogany, genuine; mahogany, imitation; maple, genuine; oak; walnut, genuine American; walnut, imitation; and white enamel. Gives requirements for material, workmanship, sizes, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 539; 1942. Chairs; Office, Wood (Rotary, Stenographic, and Leg Types). Covers three types: (A) Rotary, army chair, (C) stenographic chair, and (D) leg chair, without arms. Shall be selected birch, hard maple, American walnut, or white oak. Gives requirements for construction, hardware, finish, color, style and design, and dimensions; methods of inspection; and packing and marking.

435.3 DESKS AND OFFICE TABLES, WOODEN

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications 71. Desks; Pupil's Table, With Open Front Book Boxes.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications 72. Desks; Pupil's, Movable, With Study Tops.

U. S. Gov., Federal Specification AA-D-201; 1930. Amendment 2; 1935. Desks; Wood. Covers six types—flat top, single, in six sizes; roll top, in two sizes; and typewriter, flat top, in three types—drop at either right or left side (in one size), drop at center (in one size), compartment in either right or left pedestal and three drawers in other pedestal (in two sizes). Gives requirements for material (mahogany, oak, birch, or other woods selected to match mahogany or walnut), design, construction, legs, panels, tops, heads, decks, slides, drawers, pedestal-partition rails, sweep arms, typewriter beds, fittings, hardware, finish, and color; methods of inspection; and requirements for packing and marking.

U. S. Gov., Federal Specification AA-T-101; 1932. Tables; and Typewriter Stands; Wood. Covers two types—(I) tables for office use, and (II) typewriter stands for office use; in six grades—(A) quartered oak, (B) plain oak, (C) mahogany, (D) imitation mahogany, (E) genuine American Walnut, and (F) imitation walnut. Gives requirements for tops, legs, drawers, locks, and finish; method of inspection; and requirements for packing and marking.

U. S. Gov., Treasury Dept., Procurement Div., 265A; 1938. Desks; Office, Wood. Shall be of 3 types, flat-top, single; flat-top, double; and typewriter, in mahogany, quartered oak, or walnut finish. Gives requirements as to material and workmanship, wood, framing, veneers, design, finish, drawers, methods of inspection, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 521; 1941. Desks; Office, Wood. Covers three types—(I) flat-top single (double pedestal and single pedestal), (II) flat-top double, and (III) typewriter (compartment in left pedestal, compartment in right pedestal, drop at center, and drop at left side); and three finishes, (A) quartered oak, (B) combination walnut, and (C) genuine walnut. Gives requirements for wood, glue, exposed surfaces, framing, veneers, design, wiring, legs, glides, panels, tops, slides, drawers, finish, color, and size; methods of inspecting, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 537A; 1942. Desks; Office, Wood, Table Type. Covers two types—(I) typewriter, typewriter well on left; (II) clerical, flat top. Shall be walnut finish. Gives requirements for wood, glue, glued joints, exposed surfaces, framing, veneers, tops, design, tolerances and height, legs, panels and rails, drawer, typewriter well, shelf, and glue blocks and braces; methods of inspection and tests; and packing and marking.

U. S. Gov., Veterans Administration. Specification VA-G-61a; 1935. Desks; Writing, No. 601.

U. S. Gov., Veterans Administration. Specification VA-G-332; 1939. Charging Desk; Leg Type.

References.—Veneer, plywood, and other furniture stock, *see* 413.52, 413.53; metal desks and tables, *see* 613.4, 613.6; desk locks, *see* 617.21.

435.4 WOODEN DOCUMENT BOXES

435.5 WOODEN FILING CASES AND CABINETS

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-44; 1929. Stationery Holder. For mounting on telegraph table, box type of holder with open horizontal shelves, constructed of oak, varnished finish, with dimensional drawings.

U. S. Gov., Federal Specification AA-F-801; 1933. Amendment 1; 1944. Furniture and Cabinets; Office, Sectional, Wood. Includes small sections, horizontal sections, upright sections, bookcase sections, and cabinets and trays, (card filing). Gives requirements for material (quartered white oak, mahogany, walnut, birch, quarter-sawed red gum), design, framing, joints, moldings, face veneers, panels, backs, partitions, drawers, finish, frames, hardware, and details; method of inspection and tests; and packing and marking.

U. S. Gov., Navy Dept. Specification 53F3a; 1938. Files; Board, Paper.

U. S. Gov., Treasury Dept., Procurement Div., 535b; 1942. Files; Wood, Finished End, Vertical Type. Covers type I—letter size, four-drawer; type II—cap size, four-drawer; type III—card index, for 3 x 5 in. cards, 8 or 10 drawers high; type IV—card index, for 4 x 6 in. cards, 8 drawers high; type V—card index, for 5 x 8 in. cards, 7 drawers high; type VI—tabulating card for 3 1/4 x 7 3/8 in. cards, 9 or 10 drawers high. Gives requirements for metal parts, construction, drawers, pulls, locks, and finish; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Treasury Dept., Procurement Div., 552A; 1942. Trays; File, Wood. Covers type I, index card trays—class (a) without cover or compressor, class (b) with cover, class (c) with compressor, class (d) with cover and compressor; type II, letter (vertical file) trays, with or without stands. Gives requirements for card sizes, wood, kind of wood, framing, joints, bottoms, finish, color, and details for each type; methods of sampling and inspection; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 635; 1943. Cases; Transfer, Wood. Covers one type and one grade in two sizes, (I) letter size and (II) cap size. Gives requirements for material, panels, construction, drawer, finish, tests, marking, and assembly; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1633-A; 1944. Cabinet BE-89; Plotting, for Radio Direction Finder Central TC-8.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1656A; 1944. Cabinet BE-93; Plotting, for Radio Direction Finder Central TC-8.

U. S. Gov., Veterans Administration. Specification VA-GC-359; 1942. Drawer Type Proofers.

References.—Veneer, plywood, and other furniture stock, *see* 413.52, 413.53; steel filing cases, *see* 613.7.

435.6 WASTE PAPER BASKETS

References.—Metal baskets, *see* 932.3.

435.7 COSTUMERS

U. S. Gov., Federal Specification AA-C-556; 1935. Costumers; Wood. Covers one type and five classes—(A) mahogany, genuine; (B) mahogany, imitation; (C) oak, quartered; (D) walnut, genuine American; (E) walnut, imitation. Gives requirements for wood, glue, glued joints and built-up cores, exposed surfaces, soft wood, tolerance, marking, construction, finish, color, and shape; methods of sampling, inspection; and requirements for packaging, packing, and marking.

436. STORE FURNITURE AND FIXTURES, WOODEN

U. S. Gov., Treasury Dept., Procurement Div., No. 596; 1942. Cabinets; Towel, Wood. Covers one type and grade. Gives requirements for general construction, capacity, dimensions, finish, and mounting; methods of sampling, inspection, and tests; and packaging, packing, and marking.

436.1 BLOCKS, BUTCHERS

U. S. Gov., Federal Specification NN-B-476; 1944. Blocks; Meat and Tables; Cutting, Meat. Covers one type, one grade, and four sizes of meat blocks; and one type, one grade, and one size of cutting tables. Gives requirements for height, dimensions, material, workmanship, finish, and details for meat blocks and cutting tables; methods of inspection; and packing and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-105; 1941. Block; Butchers'.

U. S. Gov., Veterans Administration. Specification VA-GC-101c; 1938. Meat Blocks.

437. CHURCH, SCHOOL, AND THEATER FURNITURE, WOODEN

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R111-30; 1930. Color for School Furniture. This recommendation establishes a color brown with fixed light and dark limits of shades within this color for stock varieties of wooden school furniture covering school seating (pupils' desks), teachers' desks, movable desks, recitation seats, chairs, tablet arm chairs, tables, typewriter tables, library furniture, filing cabinets, bookcases, kindergarten tables and chairs, and laboratory furniture. Initiated by National School Supplies and Equipment Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R191-43; 1943. School Tables. Covers the standardization of sizes of school tables other than tables for science and vocational classrooms. Gives sizes and heights for individual pupil table, two-pupil table, general-purpose and library tables, lunchroom and project tables, bookkeeping table, typewriter table, and heights of chairs. Sponsored by the American Council on Education and the Interstate School Building Service.

438. WOODEN CHAIRS

438.0 GENERAL ITEMS

438.1 DINING-ROOM CHAIRS

438.2 WOODEN OFFICE CHAIRS

U. S. Gov., U. S. Army, Medical Dept. Specification 32-50; 1942. Chair; Arm, Reception Room.

References.—Office chairs, *see* 435.2; packing of chairs, *see* 436.0.

438.3 FOLDING CHAIRS AND CAMP STOOLS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R80-28; 1928. Folding and Portable Wooden Chairs. This recommendation establishes a schedule of types, arrangements, and finishes for folding and portable wooden chairs. Initiated by the National School Supplies and Equipment Assn.

U. S. Gov., Treasury Dept., Procurement Div., No. 672; 1944. Chairs; Folding, Wood. Covers two types—(I) plywood seat and back and (II) solid wood frame seat and back. Gives requirements for colors, solid wood members, workmanship, construction, legs, stretchers, crossties, hardware, wood finish, metal finish, and details for each type; methods of sampling, inspection, and tests; and packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 32-11B; 1942. Stool; Mess.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-45; 1939. Chair; Field.

U. S. Gov., U. S. Maritime Commission. Specification 26-MC-2a; 1941. Chair; Steamer, Folding, Wood. Shall be type I—all hardwood (one species), with cadmium-plated brass fittings; type II—combined hardwoods, with cadmium-plated brass fittings; shows eight classes, and shall be but one grade and one size. Gives requirements for wood, glue, hardware and fittings, workmanship, sanding, finish, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 26-MC-4; 1941. Chair; Folding, Flat, Wood. Shall be of but one type, one grade, and one size as herein specified. Gives requirements for wood species, plywood, artificial leather, padding, hardware and fitting, workmanship, sanding, finish, inspection, and tests.

References.—Packing of chairs, *see* 438.0.

438.4 WHEEL CHAIRS

438.5 STOOLS

U. S. Gov., U. S. Maritime Commission. Specification 26-MC-10; 1943. Stools; Bathroom, Wood. Shall be but one type, grade, and size. Gives requirements for wood, workmanship, construction, finish, sampling, inspection, test, and drawing.

438.9 MISCELLANEOUS WOODEN CHAIRS

U. S. Gov., U. S. Army, Medical Dept. Specification 32-34B; 1942. Chair; Arm, Slat, Seat and Back.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-37A; 1942. Chair; Arm, Rocking, Slat Seat and Back.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-42; 1939. Chair; Common, White Oak.

U. S. Gov., U. A. Army, Quartermaster Corps. Specification 23-100A; 1938. Chair; Barrack.

U. S. Gov., Veterans Administration. Specification VA-G-73a; 1935. Chairs; Reclining, No. 470.

U. S. Gov., Veterans Administration. Specification VA-G-74a; 1934. Chairs; Arm, No. 1916.

U. S. Gov., Veterans Administration. Specification VA-G-75b; 1942. Chairs; Arm, Rocking, No. 1917.

U. S. Gov., Veterans Administration. Specification VA-G-76; 1932. Chairs; Arm, Rocking, High Back.

U. S. Gov., Veterans Administration. Specification VA-G-77a; 1939. Chair; Common, Straight Back, No. 954.

U. S. Gov., Veterans Administration. Specification VA-G-79a; 1935. Settee No. 1922.

U. S. Gov., Veterans Administration. Specification VA-G-80; 1932. Settee No. 225.

U. S. Gov., Veterans Administration. Specification VA-G-81a; 1934. Settee No. 230.

U. S. Gov., Veterans Administration. Specification VA-G-87a; 1935. Chairs; Arm, Rocking, No. 1917 Style—Walnut Finish.

U. S. Gov., Veterans Administration. Specification VA-G-96a; 1934. Chair; Windsor.

U. S. Gov., Veterans Administration. Specification VA-G-135d; 1943. Chairs; Folding, Wood, Padded Seat and Back.

U. S. Gov., Veterans Administration. Specification VA-G-156-B; 1937. Arm Chairs for N. P. Hospitals.

U. S. Gov., Veterans Administration. Specification VA-G-164g; 1940. Barrack Chairs; Straight and Rocker.

U. S. Gov., Veterans Administration. Specification VA-G-266a; 1937. Settees for N. P. Hospitals.

U. S. Gov., Veterans Administration. Specification VA-G-294c; 1930. Douglas Arm Chair.

U. S. Gov., Veterans Administration. Specification VA-X-29a; 1943. Chair; Cane.

439. MISCELLANEOUS FURNITURE, EXCEPT METAL FURNITURE

439.1 BAMBOO, RATTAN, AND REED FURNITURE, EXCEPT CHAIRS

439.2 SCREENS

439.9 MISCELLANEOUS WOODEN FURNITURE NOT OTHERWISE CLASSIFIED

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-39b; 1943. Work Room Table (Four-Drawer).

U. S. Gov., Veterans Administration. Specification VA-X-120b; 1941. Tables; Combination Pool and Billiard.

470-479 PAPER

(Except Printed Matter)

470. GENERAL ITEMS

470.1 DEFINITIONS AND CLASSIFICATION OF PAPER

American Paper and Pulp Assn. Dictionary of Paper Including Pulps, Boards, Paper Properties, and Related Paper Making Terms, 1940. Includes classification and definitions of pulps, classification of waste materials used in the paper and board industries, and definitions of papers, boards, and paper making terms.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Paper. Covers definition, composition, sources of cellulose fibers, manufacture, marketing requirements, methods of marketing, uses, market packages, grade terms by type of pulp content, classification according to type of manufacture, general classes of paper, and tests for paper.

National Assn. of Waste Material Dealers, Inc. Specifications for Waste Paper, 1938. Definitions for 25 classes including corrugated containers, and requirements for baling, freedom from objectionable foreign matter, etc. Approved by the National Paperboard Assn.

National Paperboard Assn. Boxboard, 1937. Gives definitions, gauge lists for nonbending, bending, solid news and solid wood pulpboard, pasted chipboard, pasted solid newsboard, patent coated and solid manila board, patent coated two sides, and double manila wood pulp filled board; weights per thousand square feet for four finishes; identical with U. S. Dept. of Commerce Simplified Practice Recommendation R44-36, entitled Box Board Thicknesses.

Technical Assn. of the Pulp and Paper Industry. Standard Terms used in the Sulphate Pulping Process, 0 400 p-44; 1944. Defines special nomenclature relating to process.

Technical Assn. of the Pulp and Paper Industry. Standard Terms used in the Soda Pulping Process, 0 402 p-41; 1941. Defines special nomenclature relating to process.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M124; 1936. Paper Pulp From Cereal Straws by a Modified Sulfate

Process. A modified sulfate process is outlined for the conversion of oat, rye, and wheat straws to pulps which would be suitable for the production of typewriter, book, and other grades of paper. The variables in digesting, beating, screening, and bleaching were investigated separately for the optimum conditions. Pulps of the above grades were produced in large laboratory equipment.

U. S Gov., Federal Specification UU-P-31a; 1937. Paper; General Specifications. Covers various types and grades of paper used by the field services of the Federal Government. Gives details of specifications and tests common to the article. Gives detail requirements, definition of terms, sampling and inspection; methods of inspection and tests; and requirements for packing and marking of shipments.

References.—Wood pulp, *see* 400.50; lime for use in manufacture of paper, *see* 517.2.

470.2 SIZES OF PAPER

U. S. Gov., Dept. of Commerce, National Bureau of Standards, Simplified Practice Recommendation R22-40; 1940. Paper (Basic Sheet Sizes). This recommendation establishes a simplified schedule of sizes of bond and writing papers, ledgers, loose-leaf ledgers, machine-posting ledgers, book paper, index bristol, and cover paper. Sponsored by the Book Paper Mfrs. Assn. and Writing Paper Mfrs. Assn.

470.3 TESTS OF PAPER

American Oil Chemists' Society. Methods of Testing Soap Wrapper Papers, 1937. For discoloration with white floating, white filled laundry, and uncolored, freshly milled, toilet soaps.

American Society for Testing Materials, D 527-41; 1941. Technical Assn. of Pulp and Paper Industry Standard Method T 426m-40. Method of Test for Bulking Thickness of Paper. For average thickness in a pile, as for use in books, definition, apparatus, calibration, test specimen, and procedure.

American Society for Testing Materials, D 528-41; 1941. Technical Assn. of Pulp and Paper Industry Standard Method T 409m-35. Method of Test for Machine Direction of Paper. For finding direction of paper parallel to forward movement in manufacture, test specimen, and four methods of determination.

American Society for Testing Materials, D 548-41; 1941. Technical Assn. of Pulp and Paper Industry Standard Method T 428m-40. Method of Test for Water-Soluble Acidity or Alkalinity of Paper. For determining water-soluble acidity or alkalinity, except for highly alkaline papers such as those containing casein or calcium carbonate, or electrical insulating papers. Apparatus, reagents, test specimen, procedure, and calculations and report.

American Society for Testing Materials, D 549-41; 1941. Technical Assn. of Pulp and Paper Industry Standard Method T 408m-44. Method of Test for Resin in Paper. Qualitative test and quantitative determination.

American Society for Testing Materials, D 585-42; 1942. Technical Assn. of Pulp and Paper Industry Standard Method T 400m-41. Method of Sampling Paper and Paper Products. Requirements for size and protection of samples, percentage of samples from rolls, cases, frames, skids or bundles, and method of selection.

American Society for Testing Materials, D 586-42; 1942. Technical Assn. of Pulp and Paper Industry Standard Method T 413m-40. Method of Test for Ash Content of Paper and Paper Products. For an approximate measure of the amount of filling and coating materials, residues from chemicals and metallic matter from piping and machinery; requirements for apparatus, specimen, outline of procedure, calculation, and report.

American Society for Testing Materials, D 587-42; 1942. Technical Assn. of Pulp and Paper Industry Standard Method T 415m-41. Method of Test for Casein in Paper (Qualitative). For use where amount of casein is relatively large, as in mineral-coated papers in which casein is used as a binder, but not for small amounts as used in the beater furnished as a constituent of the engine sizing, etc.; reagents, specimen, and procedure.

American Society for Testing Materials, D 588-42; 1942. Technical Assn. of Pulp and Paper Industry Standard Method T 429m-44. Method of Test for Alpha-, Beta-, and Gamma-Cellulose in Paper. For determination of the three fractions into which cellulose can be separated analytically, alpha-cellulose separation method primarily for papers made from rags or chemical wood fibers. Covers Koerner type grinder, mixer, titration apparatus, reagents, test specimen, volumetric and gravimetric methods of separating alpha-cellulose, and beta- and gamma-cellulose procedures, calculations and report.

American Society for Testing Materials, D 589-44; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 425m-44. Method of Test for Opacity of Paper and Paper Products. For measuring opacity by apparent light reflectance; requirements for test specimen, apparatus necessary, and outline of procedure.

American Society for Testing Materials, D 590-42; 1942. Technical Assn. of Pulp and Paper Industry Standard Method T 405m-40. Method of Test for Paraffin Content of Waxed Paper. For quantitative method of determining amount of paraffin in waxed paper, but not for paraffin-sized papers; requirements for test specimen, apparatus, reagents, and outline of procedure.

American Society for Testing Materials, D 591-42; 1942. Technical Assn. of Pulp and Paper Industry Standard Method T 419m-41. Method of Test for Starch in Paper. Covers qualitative test for evident of starch, and quantitative determination; requirements for test specimen, apparatus, reagents, and outline of procedure.

American Society for Testing Materials, D 641-43; 1943. Method of Conditioning Paperboard, Fiberboard, and Paperboard Containers for Testing. Procedure for conditioning specimens of container grades of paperboard, corrugated board and solid fiberboard, and containers made from such grades of paperboard, prior to testing. Gives requirements for standard condition, apparatus, procedure, and report.

American Society for Testing Materials, D 642-43; 1943. Method of Compression Testing of Corrugated and Solid Fiber Boxes. Gives requirements for apparatus, test specimens, preparation of specimens, conditioning test specimens, moisture content, procedure, and report.

American Society for Testing Materials, D 643-43; 1943. Technical Assn. of Pulp and Paper Industry Standard Method T 423m-41. Methods of Test for Folding Endurance of Paper. Covers two test procedures. The Schopper apparatus is applicable for testing papers having a thickness of not over 0.01 in. The M.I.T. apparatus can be adjusted for testing papers of any thickness. There is no constant relation between the values obtained with the two types of apparatus. Gives requirements for apparatus, calibration, sampling, test specimens, test conditions, procedure, and report.

American Society for Testing Materials, D 644-44; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 412m-42. Method of Test for Moisture in Paper, Paperboard, and Paperboard and Fiberboard Containers. Covers the procedure for determining moisture in all papers except those containing matter other than water volatile at 100 to 105 C. Apparatus, test specimens, procedure, calculation and report, and reproducibility of results.

American Society for Testing Materials, D 645-43; 1943. Technical Assn. of Pulp and Paper Industry Standard Method T 411m-44. Methods of Test for Thickness of Paper and Paper Products. Covers the procedures for determining the thickness of all kinds of paper and paper products except crepe paper and corrugated board. Five methods are covered. Gives requirements for thickness, apparatus, calibration, sampling, test specimens, conditioning, procedure, and report.

American Society for Testing Materials, D 646-44; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 410m-44. Method of Test for Basis Weight of Paper and Paper Products. Covers the procedure for determining the basis weight of large and small pieces of paper. Factors for conversion of basis weight of large and small pieces of paper. Factors for conversion of basis weight from one commercial size of paper to another are given. Apparatus, calibration of balance, sampling, test specimens, test conditions, procedure, report, reproducibility of results, and appendix.

American Society for Testing Materials, D685-44; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T402m-44. Standard Method of Conditioning Paper and Paper Products for Testing. Giving scope, standard condition, apparatus, calibration of thermometers, determination of relative humidity and temperature, and procedure.

American Society for Testing Materials, D 686-43T; 1943. Technical Assn. of Pulp and Paper Industry Standard Method T 421m-44. Method of Qualitative Examination of Mineral Filler and Mineral Coating of Paper. Covers the procedure for the qualitative determination of the mineral constituents of filled and coated papers. Gives requirements for reagents, test specimens, procedure, and interpretation of results.

American Society for Testing Materials, D 687-44; 1944. Technical Association of Pulp and Paper Industry Standard Method T 407m-42. Method for Quantitative Determination of Coating on Mineral-Coated Paper. This method covers the procedure for the quantitative determination of the coating on the ordinary types of mineral-coated paper, in which casein (or other proteins) or starch is the adhesive. It is not intended for testing special types of coated paper, in which lacquers, varnishes, or similar materials are used.

American Society for Testing Materials, D 688-44; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 450m-44. Method of Test for Pentosans in Paper. Covers the procedure for determining complex carbohydrates in paper.

American Society for Testing Materials, D 689-44; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 414m-42. Method of Test for Internal Tearing Resistance of Paper. Covers the procedure for determining the average force in grams required to tear a specimen of paper.

American Society for Testing Materials, D 722-43T; 1943. Technical Assn. of Pulp and Paper Industry Standard Method T 454m-44. Method of Turpentine Test for Grease Resistance of Paper. This test gives an accelerated comparison of the relative rates at which ordinary oils or greases, such as commonly found in foodstuffs, may be expected to penetrate papers, such as uncoated or unimpregnated greaseproof, glassine, and vegetable parchment. Gives requirements for apparatus, reagent, sampling, test specimen, procedure, and report.

American Society for Testing Materials, D 723-43T; 1943. Technical Assn. of Pulp and Paper Industry Standard Method T 440m-42. Method of Test for Degree of Staining of Paper by Alkali. This method is applicable to undyed papers and can be used with hard sized (rosin) papers by first removing the major part of the sizing with ether or methanol. Not recommended for use with pulp. Gives requirements for apparatus, reagents, reference standards, test specimen, procedure, and report.

American Society for Testing Materials, D 724-43T; 1943. Technical Assn. of Pulp and Paper Industry Suggested Method T 458sm-42. Method of Test for Surface Wettability of Paper (Angle-of-Contact Method). Intended for the quantitative determination of the resistance of paper surfaces to wetting and is useful for the determination of writing and ruling qualities of papers, as well as for other problems related to the resistance which the surface of paper offers to water and aqueous vehicles. Gives requirements for apparatus, ink and ruling fluid, sampling, test specimens, procedure, calculation and report, reproducibility, and interpretation of results.

American Society for Testing Materials, D 725-43T; 1943. Technical Assn. of Pulp and Paper Industry Suggested Method T 455sm-42. Methods of Test for Wire and Felt Sides of Paper. The wire and felt sides of paper cannot always be distinguished, this being particularly true of coated and other surface-treated papers, and of specialties made with variations in the usual paper-machine practice. These methods of test cover four procedures, A, B, C, and D.

American Society for Testing Materials, D 726-43T; 1943. Technical Assn. of Pulp and Paper Industry Standard Method T 460m-43. Method of Test for Resistance of Paper to Passage of Air. This method applicable to papers and paper products which permit the passage of 100 cu.cm. of air in 2 sec. to 30 min., except those which cannot be clamped securely against surface leakage, such as crepe and corrugated papers. Gives requirements for apparatus, calibration of apparatus, sampling, test specimens, procedure, report, and reproducibility.

American Society for Testing Materials, D 773-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 463m-43. Method of Test for Adhesiveness of Gummed Tape. Gives scope, apparatus, calibration of apparatus, test paper, test specimens, procedure, and report.

American Society for Testing Materials, D 774-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 403m-44. Method of Test for Bursting Strength of Paper. Gives scope, definition, apparatus, calibration of apparatus, test specimens, procedure, report, and reproducibility.

American Society for Testing Materials, D 775-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 802m-44. Method of Drop Test for Shipping Containers. Gives scope, apparatus, test specimens, identification of container parts, conditioning, height of drop, procedures, and report.

American Society for Testing Materials, D 776-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 453m-41. Effect of Heating on Folding Endurance of Paper. Gives scope, apparatus, test specimens, procedure, and report.

American Society for Testing Materials, D 777-44T; 1944. Technical Assn. of Pulp and Paper Industry Suggested Method T 461sm-44. Method of Test for Flammability of Treated Paper and Paperboard. Gives scope, apparatus, test specimens, procedure, and report.

American Society for Testing Materials, D 778-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 435m-42. Method of Test for Hydrogen Ion Concentration (pH) of Paper Extracts. Gives scope, apparatus, reagents, test specimens, procedure, calculation, report, and reproducibility.

American Society for Testing Materials, D 779-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 433m-44. Method of Test for Time of Penetration by Water of Sized Paper and Paper Products (Dry Indicator Method). Gives scope, apparatus, reagents, test specimens, procedure, report, and reproducibility.

American Society for Testing Materials, D 780-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 462m-43. Method of Test for Printing Ink Permeation of Paper (Castor Oil Test). Gives scope, apparatus, test specimens, procedure, and report.

American Society for Testing Materials, D 781-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 803m-44. Method of Test for Puncture and Stiffness of Paperboard, Corrugated and Solid Fiberboard. Gives scope, number of tests, apparatus, adjustment of apparatus, conditioning, and procedure for puncture test and stiffness test.

American Society for Testing Materials, D 782-44T; 1944. Technical Assn. of Pulp and Paper Industry Suggested Method T 800sm-44. Method of Drum Test for Containers in Small Revolving Hexagonal Drum Box-Testing Machine. Gives scope, apparatus, test specimen, conditioning, procedures, and report.

American Society for Testing Materials, D 783-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T 448m-44, Desiccant Method. Tentative Method of Test for Water Vapor Permeability of Paper and Paperboard. Gives scope, definition, apparatus, test specimens, procedure, report, and reproducibility.

Technical Assn. of the Pulp and Paper Industry. Paper Drying Code, Standard E200 p-44; 1944. Water evaporation quantities, heat supplied to drying cylinders, heat supplied to ventilating air, and form for computation of efficiency.

Technical Assn. of the Pulp and Paper Industry. Standard Power Plant Report, E 201 p-44; 1944. Lists data to be obtained, and form of report, for steam, steam-electric power, hydro-electric power, and purchased power operated paper mills.

Technical Assn. of the Pulp and Paper Industry. Comparison Power Plant Report, Standard E 202 p-44; 1944. Lists data to be obtained and form of report, for steam, electric power, mechanical power, process and building heat consumption, etc.

Technical Assn. of the Pulp and Paper Industry. Measuring, Sampling and Analyzing White Waters, Standard M 400 p-40; 1940. Intended to evaluate as accurately as possible paper mill white waters, and to separate fibrous and nonfibrous constituents. Covers measurement of white water volume, sampling of white water, method of analysis, and report.

Technical Assn. of the Pulp and Paper Industry. Alkaline Pulping Thermal Code, Standard O 401 p-44; 1944. For checking steam consumption and meters, and determination of avoidable losses. Outline form of data required and form of report.

Technical Assn. of the Pulp and Paper Industry. Sulphate Recovery Thermal Code, Standard O 404 p-40; 1940. To enable users to better evaluate the thermal factors involved in sulphate recovery and is applicable to both spray-type and rotary-type recovery units. Outline form of data required and form of report.

Technical Assn. of the Pulp and Paper Industry. Fiber Composition of Paper, Standard T 401 m-42; 1942. Covers identification of types of fibers present in paper and their quantitative estimation. Covers apparatus and materials, test specimen, disintegration of sample, preparation of slides, method of procedure, standard stains, and appendix on fiber analysis, illustrations, and tables.

Technical Assn. of the Pulp and Paper Industry. Bursting Strength of Paper, Standard T 403 m-44; 1944. Specifies the use of the hydraulic type tester. Covers apparatus, calibration, test specimen, procedure, and report.

Technical Assn. of the Pulp and Paper Industry. Tensile Breaking Strength of Paper, Standard T 404 m-44; 1944. Covers apparatus required, calibration, test specimen, procedure, report, reproducibility of results, and additional information.

Technical Assn. of the Pulp and Paper Industry. Reducible Sulphur in Paper, Standard T 406 m-41; 1941. For determining total amount of reducible sulphur in paper, but not for determination of silver tarnishing. Covers apparatus, reagents, test specimen, procedure, and report.

Technical Assn. of the Pulp and Paper Industry. Proteinaceous Nitrogenous Materials in Paper (Qualitative), Standard T 417 m-34; 1934. For evidence of glue and casein in paper, using ammonium molybdate method.

Technical Assn. of the Pulp and Paper Industry. Proteinaceous Nitrogen in Paper, Standard T 418 m-41; 1941. Covers apparatus required, test specimen, and gunning method of procedure for determining amount of nitrogen present, and conversion factors for glue and casein.

Technical Assn. of the Pulp and Paper Industry. Gloss of Paper, Standard T 424 m-35; 1935. Describes photometer, light source, and diffusing screen apparatus; preparation of specimen, and test method.

Technical Assn. of the Pulp and Paper Industry. Copper Number of Paper, Standard T 430 m-42; 1942. For method of testing all paper, except those containing zinc sulphide. Covers apparatus, reagents, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Water Resistance of Paper (Dry Indicator Method), Standard T 433 m-44; 1944. Consists of bringing one side of specimen in contact with water and finding time required to pass through, as indicated by the development of color in an indicator powder. Covers apparatus, reagents, test specimen, and precision.

Technical Assn. of the Pulp and Paper Industry. Acid-Soluble Iron in Paper, Standard T 434 m-35; 1935. For determining the portion of iron present that is potentially chemically reactive. Describes reagents necessary, preparation of test specimen, and method of testing.

Technical Assn. of the Pulp and Paper Industry. Hydrogen Ion Concentration (pH) of Paper Extracts, Standard T 435 m-42; 1942. The pH value of a paper refers to its acidity or alkalinity in terms of hydrogen ion concentration of the unfiltered aqueous extract of the cut or ground paper. Covers apparatus, reagents, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Arsenic in Paper, Standard T 436 m-36; 1936. Gutzeit apparatus used for determination of arsenic, reagents to be used, standard stains, preparation of specimen, and method of test.

Technical Assn. of the Pulp and Paper Industry. Dirt in Paper, Standard T 437 m-43; 1943. Method adapted to numerical estimation of dirt in paper in terms of area and number. Describes standard comparison chart, apparatus, test specimen, procedure, report, and reproducibility of results.

Technical Assn. of the Pulp and Paper Industry. Zinc Pigments in Paper, Standard T 438 m-37; 1937. For determining the amount of zinc pigment contained in the paper filler; reagents required, test specimen, and outline of test procedure.

Technical Assn. of the Pulp and Paper Industry. Titanium Pigments in Paper, Standard T 439 m-44; 1944. Method of analysis of paper ash as modified by presence of three titanium pigments. Describes Jones reductor apparatus, reagents required, preparation of specimen, and qualitative and quantitative analysis procedure.

Technical Assn. of the Pulp and Paper Industry. Water Absorptiveness of Non-Bibulous Papers and Paper Boards, Standard T 441 m-42; 1942. For paper and paperboard over .004 in. in thickness. Covers apparatus, reagent, test specimen, procedure, report, precision, and additional information.

Technical Assn. of the Pulp and Paper Industry. Spectral Reflectivity and Color of Paper, Standard T442 m-40; 1940. For ratio of light reflected by sample to that from a pure magnesium oxide surface, and for color using standard observer and colorimetric coordinate system. Requires use of spectrophotometer for wave-length range of 400 to 700 millicrons, and outlines method of procedure.

Technical Assn. of the Pulp and Paper Industry. Water Permeability of Paper and Paper Boards (Ground Glass Method), Suggested Method T443 sm-39; 1939. For use in mill-control testing and purchasing specifications, especially highly water resistant such as asphalt paper, to obtain transudation time limit. Details selection of specimen and outlines method of testing.

Technical Assn. of the Pulp and Paper Industry. Silver Tarnishing Test of Paper, Standard T 444 M-41; 1941. To determine the presence or absence of materials which will tarnish or stain silver in paper used for wrapping silverware. Covers apparatus, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Identification of Specks and Spots in Paper, Suggested Method T 445 sm-44; 1944. Requires use of Greenough binocular microscope, and gives tests for alum spots, bark, coal, hair, iron, oil, resin, sand, etc.

Technical Assn. of the Pulp and Paper Industry. Moisture Expansivity of Paper, Standard T 447 m-42; 1942. By expansivity is meant the capacity to change dimensions. Covers apparatus, calibration, test specimen, procedure, precision, and report.

Technical Assn. of the Pulp and Paper Industry. Water Vapor Permeability of Paper and Paperboard, Standard T 448 m-44; 1944. Covers scope, apparatus and equipment, test specimens, procedure, report, and precision.

Technical Assn. of the Pulp and Paper Industry. Bacteriological Examination of Paper and Paperboard, Suggested Method T 449 sm-40; 1940. Covers scope, apparatus and equipment, chemicals and media, sterilization of equipment and media, sampling, preparation of sample, plating and incubating, counting plate cultures, calculation and results, and report.

Technical Assn. of the Pulp and Paper Industry. Rigidity, Stiffness and Softness of Paper and Paperboard, Standard T 451 m-44; 1944. Covers scope, definitions, apparatus, test specimen, procedure, report, precision, and additional information.

Technical Assn. of the Pulp and Paper Industry. Brightness of Paper, Suggested Method T 452 sm-42; 1942. Brightness, as applied to white and near-white papers, has come to be associated with the numerical value of the reflectance of these papers to light. Covers apparatus, calibration, test specimen, procedure, report, and appendices.

Technical Assn. of the Pulp and Paper Industry. Heat Test for Relative Stability of Paper, Standard T 453 m-41; 1941. This method produces the deteriorative chemical reactions, with the exception of photochemical reactions, of the normal components of paper that would cause brittleness of the paper on aging. Covers apparatus, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Wet Tensile Breaking Strength of Paper, Standard T 456 m-44; 1944. For determining the tensile strength of paper after it has been wetted with water. Covers apparatus, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Stretch of Paper and Paperboard, Standard T 457 m-42; 1942. Termed the percentage elongation of a strip of paper up to, and partly including, rupture under tension. Covers apparatus, calibration, test specimen, procedure, report, reproducibility of results, and notes.

Technical Assn. of the Pulp and Paper Industry. Wax Test for Surface Strength of Paper, Standard T 459 m-42; 1942. Applicable to coated and uncoated papers and is designed to measure the surface strength of paper or its resistance to picking. Covers apparatus and materials, test specimen, procedure, and report.

Technical Assn. of the Pulp and Paper Industry. Flammability of Treated Paper and Paperboard, Suggested Method T 461 sm-44; 1944. Applicable to papers and paperboards of all types that have been treated to prevent the spread of flame when ignited. Covers apparatus, test specimen, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Printing-Ink Permeation of Paper (Castor-Oil Test), Standard T 462 m-43; 1943.

Technical Assn. of the Pulp and Paper Industry. Adhesiveness of Gummed Paper Tape, Standard T 463 M-43; 1943.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T250; 1924. Pulp and Paper Fiber Composition Standards. Colored charts as reference standards, showing the color reactions of common paper-making fibers and standard fiber mixtures with various stains for use in identification and estimation of fiber composition of paper, method of preparing the stains used.

References.—Tests of electrical insulating paper, *see* 719.50, 719.52.

470.4 FILLERS, PAPER

Technical Assn. of the Pulp and Paper Industry. Analysis of Mineral Fillers, Standard T 615 m-44; 1944. Gives requirements and general tests for various white minerals used as fillers in paper manufacture. Covers general tests including sampling, color, and grit (sieve test) and specific tests for clay and calcium sulphate fillers.

470.9 MISCELLANEOUS ITEMS

National Safety Council, sponsor. American Standards Assn., P1-1936. Safety Code for Paper and Pulp Mills. Safety rules covering unloading and storage of pulp wood, guarding of saws, hand barkers, barking drums, etc., guards and safe operation in rag and old paper preparation, acid making, chemical processes of making pulp, preparing pulp for paper machine, machine room, and finishing room.

471. ABSORBENT PAPER

471.1 BLOTTING PAPER

Technical Assn. of the Pulp and Paper Industry. Ink Absorption of Blotting Paper, Standard T 431 m-41; 1941. Covers standard ink, test specimen, procedure, report, and precision.

U. S. Gov., Federal Specification UU-P-63; 1933. Amendment 1, 1936. Paper; Blotting. Covers three types—(A) 25 percent rag blotting, white and colored; (B) desk, blotting, colored; and (C) paper, blotting, white and colored. Gives requirements for stock, weight, bursting strength, finish, absorption, and color; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-417; 1932. Paper; Photographic, Blotting, White. Covers one grade—furnished in reams, half reams, and rolls. Gives requirements for color, thickness, weight, stock, purity, absorption, and surface finish; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Miscellaneous Paper—25 Percent Blotting, White and Colored, 1944. Gives requirements for stock, weight, bursting strength, absorption (lcc. standard ink), color and finish. Developed by Joint Committee of Congress on Printing.

References.—Methods of testing, *see* 470.3; definitions and classification, *see* 470.1.

471.2 FILTER PAPER

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes filter paper, sizes selected as standard for stock.

U. S. Gov., Army Air Forces. Specification 12024; 1937. Filter; Wood Pulp.

U. S. Gov., Federal Specification UU-P-236; 1944. Paper; Filtering. Covers three types—(I) qualitative, (II) quantitative, and (III) hardened; and eight grades. Gives requirements for material, workmanship, and details for each type and grade; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-19B; 1938. Paper; Filter.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-80e; 1941. Filter Paper.

References.—Definitions, *see* 470.1.

471.3 PAPER TOWELING

American Hospital Assn., 55-46. Paper Towels. Covers two types. Based on U. S. Gov. Federal Specifications UU-T-591 for Paper Towels; and UU-P-31a for General Specifications Paper.

Technical Assn. of the Pulp and Paper Industry. Water Absorption of Bibulous Papers, Standard T 432 m-42; 1942. For paper having a fairly rapid rate of water absorption, such as paper toweling. Covers test specimen, procedure, report, and precision.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-59-S. Towels; Hand, Paper.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C407; 1935. Standards for Paper Towels. Gives information of a study made by the National Bureau of Standards with the cooperation of paper towel manufacturers. It covers physical properties of paper towels, testing and a discussion of test data.

U. S. Gov., Federal Specification UU-T-591; 1933. Amendment 4; 1943. Towels; Paper. Covers two types, A and B. Gives requirements for workmanship, sizes, tolerances in all sizes, area, stock, odor, finish, and details for each type; methods of sampling and testing; and packaging, packing, and marking.

References.—Methods of testing, *see* 470.3; definitions and classification, *see* 470.1.

471.9 MISCELLANEOUS ABSORBENT PAPER

References.—Stereotype molding paper, *see* 479.4.

472. PAPER BOARDS

472.0 GENERAL ITEMS

National Paperboard Assn. Boxboard, 1937. Gives definitions, gage lists for nonbending, bending, solid news and solid wood pulpboard, pasted chipboard, pasted solid newsboard, patent coated and solid manila board, patent coated two sides, and double manila wood pulp filled board; weights per thousand square feet for four finishes; identical with U. S. Dept. of Commerce Simplified Practice Recommendation R44-36 entitled Box Board Thicknesses.

U.S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 51. Board; Lookout Map Base (Koch).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R44-36; 1936. Box Board Thicknesses. This recommendation establishes a list of standard thicknesses for various weights and finishes for nonbending boards, bending boards, solid news and solid wood pulp board, pasted chip board, pasted solid news board, patent coated, and double manila wood pulp filled board. Initiated by the Folding Paper Box Assn. and the National Paperboard Assn.

472.1 COMBINATION BOARD (NONHOMOGENEOUS, ONE OPERATION)

472.11 Chip Board (Jute-Lined, Manila-Lined, News Vatlined)

References.—Definitions and classification, *see* 470.1.

472.12 Manila Board (Clay Coated, Patent Coated)

References.—Definitions and classification, *see* 470.1.

472.13 News Board (Manila-Lined, Patent Coated)

U. S. Gov., Government Printing Office. Miscellaneous Board—Newsboard, 1944. Gives requirements for weight, thickness, bursting strength, surface and general appearance. Developed by Joint Committee of Congress on Printing.

References.—Newsboard as binders board, *see* 472.32; definitions and classification, *see* 470.1.

472.14 Pulp Board

References.—Pulp board for boxes, *see* 953.2; fillers and flats of pulpboard for egg cases, *see* 953.36; definitions and classification, *see* 470.1.

472.15 Strawboard (Jute-Lined, Manila-Lined, Vatlined)

References.—Standard sizes, methods of testing, *see* 472.0, 470.3; strawboard for boxes, *see* 953.2; definitions and classification, *see* 470.1.

472.16 Boxboard, Lined

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-79A; 1937. Boxboard; for Use in Ammunition.

References.—Standard sizes, methods of testing, *see* 472.0, 470.3; definitions and classification, *see* 470.1; corrugated strawboard, *see* 472.25.

472.19 Miscellaneous Lined Boards

References.—Standard sizes, methods of testing, *see* 472.0, 470.3; definitions and classification, *see* 470.1.

472.2 PASTED BOARD (TWO OPERATIONS)

472.21 Pasted Chip Board

References.—Definitions and classification, *see* 470.1.

472.22 Sheet-Lined Chip Board

References.—Definitions and classification, *see* 470.1.

472.23 Sheet-Lined Straw Board

References.—Definitions and classification, *see* 470.1.

472.24 Wall Board

U. S. Gov., Federal Specification UU-W-101a; 1935. Wallboard; Composition. Covers one grade—manufactured of vegetable fiber thoroughly mixed with beater size. Gives requirements for physical characteristics, weight, transverse strength, linear expansions, thickness, finish, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions and classification, *see* 470.1.

472.25 Corrugated Strawboard

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R177-41; 1941. Single-Faced Corrugated Paper Rolls. This recommendation establishes a standard width and length of paper rolls, and construction and standards covering liners and corrugated sheets. Initiated by the National Retail Dry Goods Assn.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 19-10B; 1928. Filer; Strawboard, Corrugated, Single and Double Faced, for General Packing Purposes.

References.—Standard sizes, methods of testing, *see* 472.0, 470.3; strawboard for boxes, *see* 953.2; definitions and classification, *see* 470.1.

472.26 Lining Board

U. S. Gov., Army Air Forces. Specification 40339; 1940. Paper; Indented, Lining Board.

472.3 SOLID BOARD (HOMOGENEOUS, ONE OPERATION)

472.31 Chip Board (Plain, Tack Board, Test)

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Chip Board and Binder Board. Covers definition, sizes, classification and uses, manufacture, and marketing.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS49-34; 1934. Chip Board, Laminated Chip Board, and Miscellaneous Boards for Bookbinding Purposes. This standard establishes definite specifications for various kinds of boards other than binders board used for covers or cover stiffening in books and for other bookbinding purposes. The standard also includes a classification relating to several grades of boards, detail requirements, and methods of sampling and testing. This standard was approved as American Standard by the American Standards Assn. Initiated by industry, now represented by Book Manufacturers Institute.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-86; 1934. Chipboard; Plain, for Ammunition Containers.

References.—Standard sizes, methods of testing, *see* 472.0, 470.3; definition and classification, *see* 470.1.

472.32 Binders Board

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Chip Board and Binder Board. Covers definition, sizes, classification and uses, manufacture, and marketing.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R81-28; 1928. Binder's Board. This recommendation establishes 10 sizes of binder's board as standard for stock purposes. Initiated by manufacturers and Employing Bookbinders of America.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS50-34. American Standards Assn., CS50-1934. Binders Board for Bookbinding and Other Purposes. Requirement on a single-ply, solid board made on a wet machine from a base stock of mixed papers, kiln or plate dried, and ranging in thickness from 30 points (0.030 in.) to 300 points (0.300 in.); standard sizes, color, density, trim, thickness, bursting strength, flexural properties, and thickness tolerance.

U. S. Gov., Federal Specification UU-B-536; 1940. Board; Binders'. Covers one grade. Gives requirements for average thickness, bursting strength, and other properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Gov. Printing Office. Miscellaneous Board—Binder's Board, No. 1 Quality, 1944. Gives requirements for weight, bursting strength, thickness, density, trim, and general requirements. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Miscellaneous Board—Binder's Board, Best Quality, 1944. Gives requirements for weight, bursting strength, thickness, density, size, water resistance, and general requirements. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Miscellaneous Board--Chestnut Cover Board, 1944. Gives requirements for weight, bursting strength, thickness, density, tolerances, trim, and general requirements. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Veterans Administration. Specification VA-G-20a; 1936. Board; Binders.

References.—Lined strawboard, binders board, *see* 472.15; lined boxboard, binders board, *see* 472.16; marble grained lined board, binders board, *see* 472.19; standard sizes and thicknesses, *see* 472.0; methods of testing, *see* 470.3; definitions and classification, *see* 470.1.

472.33 Friction Board

References.—Definitions and classification, *see* 470.1.

472.34 Jute Board

References.—Definitions and classification, *see* 470.1; jute tag board, *see* 474.5.

472.35 Leather Board

References.—Definitions and classification, *see* 470.1.

472.36 Pressboard

U. S. Gov., Army Air Forces. Specification 17008; 1940. Paper—Press Board.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M123; 1936. Production of Pressboard From Cornstalks. A process for the production of pressboard from cornstalks, consisting in stalk preparation, pulping, forming, pressing, and drying under pressure, and sizing, is outlined. Stalk preparation by reduction to short lengths and removal of wire and dirt facilitated handling and reduced wear on the machines. The experimental results showed that boards could be produced with a range of the modulus of rupture from 2,040 to 7,500 lb./in.^{2} by varying the degree of cooking given the stalks from 0 to 3 hr. at 140° C., in water, followed by a two-stage mechanical refining treatment. The two-stage milling was found to be advantageous in producing a uniform pulp.

U. S. Gov., Federal Specification UU-P-701a; 1939. Pressboard; Colored. Covers two types. Gives requirements for weight, average thickness, and average bursting strength; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Gov. Printing Office. Miscellaneous Board—Pressboard, Colored, 1944. Gives requirements for bursting strength, thickness, texture, surface, and color. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 473.0, 470.3; definitions and classification, *see* 470.1.

472.37 Pulp Board

References.—Pulpboard for boxes, *see* 953.2; fillers and flats of pulpboard for egg cases, *see* 953.36; definitions and classification, *see* 470.1.

472.38 Strawboard

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-69; 1939. Strawboard; for Packing Ammunition.

References.—Standard sizes, methods of testing, *see* 472.0, 470.3; corrugated strawboard, *see* 472.25; lined strawboard, *see* 472.15; strawboard for boxes, *see* 953.2; fillers and flats of strawboard for egg cases, *see* 953.36; definitions and classification, *see* 470.1.

472.9 MISCELLANEOUS BOARDS

472.91 Fish Paper

References.—Electrical insulating fiber and paper, *see* 719.52; definitions and classification, *see* 470.1.

472.92 Fuller Board

References.—Electrical insulating fiber and paper, *see* 719.52; definitions and classification, *see* 470.1.

472.93 Fiber Board

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards. 4.0; 1941. Miscellaneous Ammonia Standards. Cold Storage Room Insulation. Gives recommended thicknesses of insulation for certain required temperatures.

American Hospital Assn., 4-7. Fiber Insulating Board. A minimum specification for two classes of a certain type of fiber insulating board designated as Insulating Building Board and Roof Insulating Board. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Commercial Standard CS 42-35 for Fiber Insulating Board.

American Hospital Assn., 4-19. Structural Hard-Pressed Fiber Board. Covers two classes—(A) untreated and (B) treated. Based on U. S. Gov. Federal Specification LLL-F-311 for Structural and Hard-Pressed Fiber Board.

National Paperboard Assn. Container Boards, 1937. Gives definitions, requirements for rolls, trim, test, moisture content, bending, waterproofing, caliper, weight, standard grade, basic grade, gage lists for double fiberboard made with two jute liners and one or more ply of chip, sized on one side, colored on one or both sides, test boards and non-test boards, weights per thousand square feet.

Society of Automotive Engineers. Aeronautical Material Specification 3552, 1944. Corrugated Fibreboard (Single Wall, Double Face). Covers material, application, construction, requirements, quality, reports, marking, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3554; 1944. Corrugated Fibreboard, Double Wall. Gives requirements for material, application, construction, requirements, quality, reports, marking, approval, and rejections.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 42-43; 1943. Structural Fiber Insulating Board. Sponsored by the Insulation Board Institute. Gives five classes: (A) Building board, (B) lath (for plaster base), (C) roof insulation board, (D) interior board (factory finished), and (E) sheathing. Covers physical requirements and tests for thermal conductivity, strength, absorption, and expansion and sets forth the standard commercial sizes, tolerances; and method of sampling and testing; and packing and labeling.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 112-43; 1943. Homogeneous Fiber Wallboard. Covers one type of homogeneous fiber wallboard of a nominal thickness of 5/16 in., 4 ft. wide, and 6 to 12 ft. long. Gives requirements for composition, treatment for destruction of rot-producing fungi, surfaces, edge finish, physical properties, standard commercial sizes, and tolerances; method of sampling and testing; and packing and marking.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS3; 1938. Suitability of Fiber Insulating Lath as a Plaster Base. The investigation pertains to the properties of wall and plaster boards and the suitability of fiber insulating boards as a plaster base. Such properties as density, strength (flexural and tensile), and linear changes accompanying changes in relative humidity and wetting and drying were studied. Methods of successful application of plaster on insulating lath were determined by experiments in which the thickness, sand content, strength, and time of set of the plasters were varied independently.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS4; 1938. Accelerated Aging of Fiber Building Boards. The aging treatments include cycles of wetting, drying, freezing, and heating in dry air, and the stability is judged by changes in physical and chemical properties. The properties most affected by aging are water absorption, nail-holding power, flexural strength, and permeability to air.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS13; 1939. Properties of Some Fiber Building Boards of Current Manufacture. Test data are given showing the properties of the different boards, and the test methods are described. Tests were made for thickness, density, thermal conductivity, flexural properties, water absorption, water permeability, air permeability, linear expansion, and nail-holding strength.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS34; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing; Part 1. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on 40 different test installations involving 12 floor coverings and 11 adhesvies. The floor coverings tested included several kinds of linoleum, felt-base floor coverings having various wearing surfaces, pressed fiberboard, and three stripwood floors. The bonding agents used included lignin pastes, various resinous cements, casein-latex cement, asphaltic cements, and nails. Installations on both a concrete subfloor and a wood subfloor were tested. Descriptions of the testing equipment and test installations are given. Results showing the relative magnitude of the depressions in the floor coverings caused by the testing equipment are summarized and presented in tables. The appearance of the various installations after 48,000 cycles of the testing equipment is discussed and representative photographs are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS 43; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing; Part 2. In the second series, 40 installations were subjected to a performance test in the floor-testing chamber of the National Bureau of Standards. Included in the tests were battleship linoleum, rubber in sheet and tile form, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of asphalt tiles. The bonding agents used included lignin pastes, resinous cements, latex adhesives, rubber cements, cut-back asphalt, and asphalt emulsions. Installations were made on both concrete and wood subfloors. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries showing the performance of the test panels are given, and the appearance of the different floor coverings after 48,000 cycles of the testing equipment is shown by representative photographs.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS50; 1940. Stability of Fiber Building Boards as Determined by Accelerated Aging. Fiber building boards were aged by exposure to cycles of wetting, freezing, drying, and baking and to outdoor weathering. The boards were tested before and after aging to determine the changes produced, and judgment of stability was based on the changes. The properties tested were weight, thickness, expansivity, thermal conductivity, flexural properties, nail-holding strength, water absorption, ash, rosin, and permeability to air and water. Data were obtained on the relationship between the moisture contents of the boards and the relative humidity of the surrounding air and on the resistance of the boards to rot-producing fungi.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use in Low-Cost Housing; Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar-resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, stripwood, and plywood subfloors. Installations on stripwood subfloors were made with the underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given, and photographs of the test panels after 48,000 cycles of the testing equipment are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS69; 1941. Stability of Fiber Sheathing Boards as Determined by Accelerated Aging. Fiber sheathing boards were aged by exposure to wetting, freezing, drying, and to outdoor weathering. Judgment of stability was based on changes produced in the properties of the boards. The properties tested were weight, thickness, expansivity, thermal conductivity, flexural properties, nail-holding strength, and permeability to air and water. Data were obtained on the resistance of the boards to rot-producing fungi.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS73; 1941. Indentation Characteristics of Floor Coverings. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65-percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevated temperature of 90° F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedures are briefly described. Summaries of the results are presented to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS 77; 1941. Properties and Performance of Fiber Tile Boards. Performance tests have been made on fiber tile boards by subjecting them to conditions which they might possibly meet in service. The properties examined were resistance to abrasive cleaning powders, resistance to staining by household chemicals, and stability of the boards when subjected to cycles of steaming and drying. In addition, data were obtained on the density, expansivity, and flexural properties of the boards, and on the thickness and impact resistance of the finish coatings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for use in Low-Cost Housing; Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 26 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were cork tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given, and their appearance at the end of the test is shown by photographs. A few generalized comments and conclusions are made.

U. S. Gov., Federal Specification LLL-F-311; 1939. Amendment 1; 1940. Fiber-Board; Hard-Pressed, Structural. Covers two classes—(A) untreated, and (B) treated. Gives requirements for properties, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-F-321b; 1942. Fiber-Board; Insulating. Covers three classes—(A) building board, (B) lath (for plaster base), and (C) roof board. Gives requirements for physical requirements, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-111; 1942. Fiberboard; Waterproof, Solid.

References.—Hard fiber and vulcanized fiber electrical insulation, *see* 719.52; fiber sheet packing for pipe joints, *see* 707.28; standard sizes and thicknesses, *see* 472.0; methods of testing, *see* 470.3; definitions and classification, *see* 470.1; fiber board for boxes, *see* 953.2.

472.94 Mill Board

References.—Asbestos millboard, *see* 545.2; definitions and classification, *see* 470.1.

472.95 Illustrating Board

U. S. Gov., Federal Specification UU-B-591; 1931. Amendment 1; 1943. Board; Illustrating. Covers highest grade, in two types—rough surface, one face; and smooth surface, one face. Gives requirements for finish, sizes and thicknesses, samples, and details; methods of inspection and tests; and packaging, packing, and marking.

References.—Standard sizes and thicknesses, *see* 472.0; definitions and classification, *see* 470.1.

473. BUILDING PAPER

473.1 ASBESTOS PAPER

References.—Asbestos paper and millboard, *see* 545.2; definitions and classification, *see* 470.1.

473.2 FELTS (CARPET LINING, DEADENING, SATURATING)

American Society for Testing Materials, D 727-43T; 1943. Technical Assn. of Pulp and Paper Industry Standard Method T 427 M-43. Method of Test for Kerosine Number of Roofing and Flooring Felt by the Vacuum Method. This method of test for the absorptive qualities of felt. Gives requirements for kerosine number, apparatus, kerosine, test specimens, procedure, and calculation and report.

References.—Hair felt, wood felt, cotton felt, rag felt, *see* 365.98; roofing felts and roofing, *see* 505.16, 505.36; definitions and classification, *see* 470.1.

473.3 THERMAL INSULATING PAPER AND FIBER

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 4.0; 1941. Miscellaneous Ammonia Standards. Cold Storage Room Insulation. Gives recommended thicknesses of insulation for certain required temperatures.

American Hospital Assn., 4-25. Blanket, Felt, and Loose-Fill Insulation (Vegetable or Wood-Fiber). Covers three classes—(A) flexible blanket, (B) semirigid felt, and (C) loose-fill. Based on U. S. Gov. Federal Specifications HH-I-571 for Insulation (Vegetable or Wood-Fiber), Blanket, Felt, and Loose-Fill and LLL-F-321a for Insulating Fiber-Board.

American Society for Testing Materials, ES-14; 1942. Emergency Specifications for Blanket Thermal Insulation for Building Purposes. Cover blanket or batt thermal insulating materials furnished in flexible or semirigid form and suitable for building purposes for application to flat or curved surfaces.

American Society for Testing Materials, ES-15; 1942. Emergency Specifications for Blanket Thermal Insulation for Industrial Purposes. Cover blanket insulating materials furnished in flexible or semirigid form and suitable for industrial purposes for application on flat or curved surfaces where surface temperatures exceed 100° F.

American Society for Testing Materials, ES-16; 1942. Emergency Specifications for Blanket Thermal Insulation for Refrigeration Purposes. Cover blanket thermal insulating materials furnished in flexible or semirigid form and suitable for refrigeration purposes for application on flat or curved surfaces.

American Society for Testing Materials, ES-19; 1942. Emergency Specifications for Structural Insulating Board (Thermal Insulation). Cover thermal insulating material made principally of vegetable fiber, in the form of insulating board suitable for structural purposes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Paper, Insulation for Refrigerator Cars, M-908-34; 1934. Fibrous material saturated with asphalt bitumen, in 90 and 110-lb. weights, porosity tests with detail of apparatus, Mullen test, bending test, before and after exposure, permissible variation in weight and inspection.

U. S. Gov., Army Air Forces. Specification 17013; 1940. Paper—Bats.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R179-42; 1942. Structural Insulating Board (Vegetable Fiber). This recommendation covers sizes, thicknesses, and treatment of edges of structural insulating board. Initiated by the Insulation Board Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS42-43; 1943. Structural Fiber Insulating Board. Sponsored by the Insulation Board Institute. Gives five classes—(A) building board, (B) lath (for plaster base), (C) roof insulation board, (D) interior board (factory finished), and (E) sheathing. Covers physical requirements and tests for thermal conductivity, strength, absorption, and expansion; and sets forth the standard commercial sizes, tolerances; and method of sampling and testing; and packing and labeling.

U. S. Gov., Federal Specification HH-I-571; 1938. Insulation (Vegetable or Wood-Fiber); Blanket, Felt, and Loose-Fill. Covers three classes—(A) flexible blanket, (B) semirigid felt, and (C) loose-fill. Manufactured from cleaned and sterile wood or other vegetable fiber; or a mixture of animal hair and wood-bark fiber. Gives requirements for thermal conductivity, construction, and thickness; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-I-571; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) removed requirements to use burlap, copper, and galvanized wire mesh.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 7Yg; 1934. Roofing, Siding, and Sheet Metal Work; Dampproofing and Membrane Waterproofing. Includes requirements for metal-covered insulation and insulating board for roof decks.

U. S. Gov., Navy Dept. Specification 17F5d; 1944. Fiber; Insulating, Gray.

U. S. Gov., Treasury Dept., Procurement Div., No. 477; 1941. Sheets, Insulation, Reflective. Covers two types—(I) 55 percent reflectivity; and (II) 90 percent reflectivity; intended for use in the thermal insulation of structures, by means of reflection of radiant heat. The sheets shall consist of two layers of kraft paper firmly cemented together by a continuous film of suitable bituminous material surfaced with a stable pigment or foil. Gives detail requirements as to thermal reflectivity, tensile strength, and bleeding; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing, *see* 470.3; definitions and classification, *see* 470.1.

473.4 SHEATHING (WATERPROOF, WHITE FIBER)

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS35; 1940. Stability of Sheathing Papers as Determined by Accelerated Aging. The more familiar types of sheathing papers were tested to obtain authoritative information on how well they can be expected to retain their desirable qualities in service. The aging treatment included cycles of wetting, freezing, drying, and baking; and the effects of the treatment were observed by comparison of the properties before and after aging. Important properties of this class of papers are resistance to the passage of air, water, and water vapor; hence, the judgment of stability was based largely on the degree of retention of those attributes.

U. S. Gov., Federal Specification UU-P-536; 1935. Amendment 1; 1943. Paper; Sheathing, Waterproof. Covers two grades—(A) for permanent structures, or for other uses where long-continued exposure to dampness may occur; and (B) for temporary structures, or other uses where long service is not required. Shall be waterproofed with asphalt. Gives requirements for tensile strength, water resistance, pliability, and size; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 59P7; 1944. Paper; Sheathing, Flameproof and Water-Repellent.

References.—Definitions and classification, *see* 470.1.

473.5 KRAFT (CONCRETE-CURINGS, WATERPROOF)

American Assn. of State Highway Officials, M74-38. Standard Specifications for Subgrade Paper. Gives scope, general requirements, physical properties, and methods of sampling and testing.

American Society for Testing Materials, C 171-42 T; 1942. Specifications for Waterproof Paper for Curing Concrete. Consists of two sheets of plain kraft paper cemented together with a bituminous material.

U. S. Gov., Federal Specification UU-P-264; 1940. Amendment 1; 1943. Paper; Kraft, Concrete-Curing, Water-Proofed. Furnished either in rolls or in rolls joined together with asphalt and lapped not less than 4 in. to form blankets. Gives requirements for stock, purchase basis, sizes of rolls and blankets, construction, tensile strength, and water resistance; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

474. CARDBOARD

474.1 BLANKS

474.11 Nonpasted Blanks

References.—Methods of testing, *see* 470.3; definitions and classification, *see* 470.1.

474.12 Pasted Blanks

U. S. Gov., Federal Specification UU-T-54a; 1944. Tabs; Index, Gummed. Covers three types—(I) cloth, class (1) individual blank tabs, (2) individual printed tabs, and (3) blank 6-in. strips; (II) paper, blank 6-in. strips; and (III) transparent-plastic covered, class (1) printed tabs and (2) insertable 6-in. strips. Gives requirements for sizes and colors, material and workmanship, cloth, paper, gum, bid samples, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Definitions and classification, *see* 470.1.

474.2 INDEX BRISTOLS

American Hospital Assn., 55-13. Manila and Railroad Bristol Cardboard. Covers three types. Based on U. S. Gov. Federal Specifications UU-C-201 for Manila and Railroad Bristol Cardboard and UU-P-31a for General Specifications for Paper.

U. S. Gov., Federal Specification UU-C-201a; 1943. Cardboard; Bristol, Manila, and Railroad. Covers three types—(I) manila board; (II) railroad board, white and colored; and (III) cardboard, wood bristol, colored. Gives requirements for size, material and workmanship, trimming, and comparison sample; details including weight, bursting strength, thickness, stock, ply, thickness, coating, color, and surface; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of testing, *see* 470.3; definitions and classifications, *see* 470.1.

474.3 MILL BRISTOLS (FOLDERS, TAGS)

American Hospital Assn., 55-13. Manila and Railroad Bristol Cardboard. Covers three types. Based on U. S. Gov. Federal Specifications UU-C-201 for Manila and Railroad Bristol Cardboard and UU-P-31a for General Specifications for Paper.

U. S. Gov., Army Air Forces. Specification 17011; 1939. Board; Bristol Sulphite.

U. S. Gov., Federal Specification UU-B-561; 1931. Board; Bristol. Covers two types—(I) rough surface, and (II) smooth surface; and two grades—first and second. Gives requirements for texture and finish; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-C-201a; 1943. Cardboard; Bristol, Manila, and Railroad. Covers three types—(I) manila board, (II) railroad board, white and colored, and (III) cardboard, wood bristol, colored. Gives requirements for size, material and workmanship, trimming, and comparison sample; details including weight, bursting strength, thickness, stock, ply, thickness, coating, color, and surface; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Gov. Printing Office. Cardboard—Manila Board, 1944. Gives requirements for weight, bursting strength, thickness, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Cardboard—Railroad Board, White and Colored, 1944. Gives requirements for stock, ply, thickness, coating, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Cardboard—U. S. Postal Card Bristol, 1944. Gives requirements for stock, ash, acidity, moisture content, weight, bursting strength, thickness, writing quality, color, finish, formation, cleanliness, and delivery. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Cardboard—Wood Bristol, Colored, 1944. Gives requirements for weight, bursting strength, thickness, surface, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

References.—Methods of testing, *see* 470.3; definitions and classifications, *see* 470.1.

474.4 WEDDING BRISTOLS

References.—Definitions and classifications, *see* 470.1.

474.5 TAG BOARDS

Tag Manufacturers Institute. Manual of Standard Specifications. Coated Stocks (Not Including Lined Stocks), 1943. Gives TMI designation, composition, weight, thickness, strength, and tolerances.

Tag Manufacturers Institute. Manual of Standard Specifications. Kraft and Dyed Stocks, 1938. Gives TMI designation, composition, weight, thickness, strength, and tolerances.

Tag Manufacturers Institute. Manual of Standard Specifications. Manila Tag Stocks (Not Including Kraft), 1943. Gives TMI designation, chemical composition, weight, thickness, strength, and tolerances.

Tag Manufacturers Institute. Manual of Standard Specifications. White Lined Tag Stocks (Bleached or Pasted White Liner), 1937. Gives construction, TMI designation, composition, weight, thickness, strength, and tolerances.

U. S. Gov., Federal Specification UU-T-81b; 1937. Amendment 3; 1944. Tags; Shipping, and Stock. Covers three types—(A) cloth, (B) paper, and (C) stock, circular, metal-bound. Gives requirements for material and workmanship, curl, surfaces, stock, average thickness, bursting strength, stringing, design, sizes, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Tag Board—Calendered Tag, Manila and Colored for Use on Tabulating Machines, 1944. Gives requirements for stock, ash, acidity, weight, folding endurance, bursting strength, thickness, color, finish, and general requirements. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Tag Board—High-Finish Chemical Wood Manila Tag, 1944. Gives requirements for stock, weight, bursting strength, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Tag Board—Jute Tag, 1944. Gives requirements for stock, acidity, weight, tearing strength, writing and erasing qualities, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

References.—Methods of testing, *see* 470.3; definitions and classification, *see* 470.1; plate wiping paper (tag board), *see* 479.4.

474.9 MISCELLANEOUS CARDBOARDS

American Hospital Assn., 49-1. 50 Percent Rag Index Cards. Based on U. S. Gov. Federal Specifications UU-C-111 for 50 Percent Rag Index Cards, and UU-P-31a for General Specifications for Paper.

American Hospital Assn., 49-4. 100 Percent Rag Index Cards For Permanent Record. Based on U. S. Gov. Federal Specifications UU-C-116 for 100 Percent Rag Index Cards for Permanent Record, and UU-P-31a for General Specifications for Paper.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Filing Cards. Covers definition, material, sizes, cutting, selection of cards, specifications, and procurement.

U. S. Gov., Army Air Forces. Specification 27588; 1944. Card; Instrument Record.

U. S. Gov., Federal Specification G-C-116; 1940. Amendment 2; 1944. Cards; Tabulating. Covers two types—(I) for electrical-contact tabulating machine and (II) for mechanical-contact tabulating machine. Gives requirements for material and workmanship, bid sample, stock, weight, ash, bursting strength, folding endurance, acidity, size, thickness, corners, printing, and color; method of sampling, inspection and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-C-76a; 1943. Cards; Guide (Card-Size). Covers one type and one grade. Gives requirements for material, color, grain, finish and cleanliness, projections, samples, stock, ash, acidity, sizing, weight, bursting strength, thickness, tabs, and sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification UU-C-86; 1934. Cards; Guide, Calendered (File-Size). Gives requirements for stock, weight, bursting strength, acidity, sizing, thickness color, finish, cleanliness, grain, size, and tabs; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification J-C-96c; 1944. Cards; Guide, Pressboard (File Size). Gives requirements for types and weights, colors, sizes, material and workmanship, lower projections, texture and finish, grain, bid samples, stock, weight, thickness, bursting strength, folding endurance, and tabs; methods of sampling, inspection, and tests; and packaging, packing and marking for shipment.

U. S. Gov., Federal Specification UU-C-128; 1941. Amendment 2; 1943. Cards; Index. Covers four grades—(1) 100 percent, for permanent records; (2) 50 percent, (3) 25 percent, and (4) wood fiber. Gives requirements for material, workmanship, ply, ruling, qualities, color, finish, size, grain, acidity, curl, detail requirements, methods of sampling, inspection, tests, and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 19-49B; 1942. Pasteboard for Targets.

References.—Bristol drawing board and paper, *see* 478.32.

475. COVER PAPER, NEWS PAPER, AND PRINTING PAPER

475.1 COATED COVER PAPER

U. S. Gov., Gov. Printing Office. Cover Paper—Antique Finish Cover, White and Colored, 1944. Gives requirements for stock, weight, folding endurance, bursting strength, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Cover Paper—Coated Cover, White and Colored, 1944. Gives requirements for stock, weight, folding endurance, bursting strength, coating and surface, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Cover Paper—50 Percent Laid Cover, Colored, 1944. Gives requirements for stock, weight, folding endurance, bursting strength, laid design, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Navy Dept. Specification 57C15; 1941. Covers; Tray, Paper.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classifications, *see* 470.1.

475.2 PASTED COVER PAPER

References.—Definitions, classification, methods of test, *see* 470.1, 470.3.

475.3 UNCOATED COVER PAPER

U. S. Gov., Federal Specification UU-C-611; 1944. Covers; Bracket-Table, Dental, Paper. Covers one grade, one class and two types—(I) square and (II) round. Gives requirements for material, workmanship, shapes, thickness, color, weight, bursting strength, and absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-G-30b; 1941. Paper; Cover or Construction.

U. S. Gov., Veterans Administration. Specification VA-G-315c; 1943. Red Rope Folders and Folder Covers.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

475.4 HANGING PAPER (NEWS), WALLPAPER

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS16-29; 1929. Wall Paper. This standard covers wall papers known in the trade as printed, plain, embossed papers, pastics, engraved papers, and varnished tiles. It governs the width of raw stock, width of printed pattern, length of commercial single roll, and coverage surface. It establishes a minimum quality level based on weight, color fastness, grounding, printing, and raw stock. Initiated by the Wall Paper Institute.

References.—Definitions and classification, methods of test, *see* 470.1, 470.3.

475.5 NEWSPRINT

U. S. Gov., Gov. Printing Office. Printing Paper—Newsprint, 1944. Gives requirements for weight, tensile strength, thickness, opacity, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—Telephone Book News, 1944. Gives requirements for weight, bursting strength, thickness, opacity, color, finish, formation, and cleanliness. Developed by Joint Commmttee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

475.6 COATED PRINTING PAPER

U. S. Gov., Gov. Printing Office. Printing Paper—Coated Book, 1944. Gives requirements for stock, weight, folding endurance, bursting strength, thickness, finish, coating and surface, color, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—Dull Coated Book, 1944. Gives requirements for stock, weight, folding endurance, bursting strength, thickness, finish, gloss, coating and surface, color, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—Machine-Coated Book, 1944. Gives requirements for weight, folding endurance, bursting strength, thickness, finish, coating and surface, color, and cleanliness. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

475.7 UNCOATED PRINTING PAPER

References.—Newsprint, *see* 475.5; definitions and classification, *see* 470.1.

475.71 Bible Paper

References.—Definitions and classification, *see* 470.1.

475.72 Book Paper

U. S. Gov., Federal Specification UU-P-465; 1933. Amendment 5; 1943. Paper; Printing, Book, Machine-Finish. Covers one type. Gives requirements for size, trimming, weight tolerance, color, stock, acidity, weight, bursting strength, thickness, opacity, oil penetration, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Printing Paper—Antique Book, 1944. Gives requirements for stock, acidity, weight, bursting strength, thickness, opacity, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—50 Percent Antique Book, 1944. Gives requirements for stock, acidity, weight, bursting strength, thickness, opacity, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—75 Percent Laid Antique Book, 1944. Gives requirements for stock, acidity, weight, folding endurance, bursting strength, thickness, opacity, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—Lightweight Machine-Finish Book, 1944. Gives requirements for stock, acidity, weight, bursting strength, thickness, opacity, oil penetration, finish, color, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—50 Percent Lightweight Machine-Finish Book, 1944. Gives requirements for stock, acidity, weight, bursting strength, thickness, opacity, oil penetration, finish, color, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—Machine-Finish Book, 1944. Gives requirements for stock, acidity, weight, bursting strength, thickness, opacity, oil penetration, finish, color, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—Machine-Finish Book End Paper, 1944. Gives requirements for stock, acidity, weight, folding endurance, bursting strength, thickness, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—Offset Book, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, thickness, opacity, curl, surface and finish, formation, color, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—Supercalendered Book, 1944. Gives requirements for stock, acidity, weight, bursting strength, thickness, opacity, oil penetration, finish, color, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; coated book paper, *see* 475.6; definitions and classification, *see* 470.1; back lining paper, *see* 479.4.

475.73 Coating Paper

References.—Definitions and classification, *see* 470.1.

475.74 Mimeograph Paper

American Hospital Assn., 55-37. Mimeograph Paper. Covers two types. Based on U. S. Gov. Federal Specifications UU-P-388a for Mimeograph Paper and UU-P-31a for General Specifications for Paper.

U. S. Gov., Federal Specification UU-P-388b; 1943. Paper; Mimeograph. Covers three types—(I) 25 percent, (II) chemical wood-white and colored, and (III) ground wood. Gives requirements for size, grain, writing quality, color, finish, formation and cleanliness, mimeographing quality, bid sample, wire mark, stock, weight, bursting strength, thickness, opacity, oil penetration, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Mimeograph Paper—Chemical Wood Mimeograph, White and Colored, 1944. Gives requirements for stock, weight, bursting strength, thickness, opacity, oil penetration, finish, sizing, color, formation, cleanliness, and mimeograph quality. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Mimeograph Paper—Ground Wood Mimeograph, 1944. Gives requirements for stock, weight, bursting strength, thickness, opacity, oil penetration, finish, sizing, brightness, color, formation, cleanliness, and mimeograph quality. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Mimeograph Paper—25 Percent Mimeograph, 1944. Gives requirements for stock, weight, bursting strength, thickness, opacity, oil penetration, finish, sizing, color, formation, cleanliness, and mimeograph quality. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

475.75 Music Paper

References.—Definitions and classification, *see* 470.1.

475.76 Offset Paper

References.—Definitions and classification, *see* 470.1.

475.9 MISCELLANEOUS PRINTING PAPER

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-80; 1938. Printer Oiled Perforator Tape AAR-1-A. Covers rolls of sulfite paper for use in the operation of automatic printer transmitters; requirements for color, tensile strength, weight, light paraffin oil, length of roll, warning stripe, and percentage of oil retained in paper.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-84; 1939. Paper on Rolls for Printer Reception AAR-1-A and AAR-2-A. For regular use in page printer reception in telegraph service, and heavier grade paper. Sulfite paper, dimensions, weight, thickness, tensile strength, and size tests in accordance with methods of the Technical Assn. of the Pulp and Paper Industries, and make-up of roll.

U. S. Gov., Federal Specification UU-P-185a; 1943. Paper; Computing-Machine. Covers two types—(I) chemical wood and (II) ground wood. Gives requirements for printing quality, writing quality, finish, widths, rolls, stock, weight, bursting strength, and brightness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

476. TISSUE PAPER

476.1 COPYING TISSUE

References.—Carbon paper, *see* 476.21; definitions and classification, *see* 470.1.

476.2 INDUSTRIAL TISSUES

476.21 Carbon Paper

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Carbon Paper. Covers characteristics of carbon paper, inks, grease carbon, one-time carbon, and containers.

U. S. Gov., Army Air Forces. Specification 17006; 1938. Paper; Carbon, Pencil, Black (Standard Weight).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C431; 1941. Typewriter Ribbons and Carbon Paper. This circular gives general information about the manufacture of typewriter ribbons and carbon paper, and tells about the methods for testing them. The materials used and the principles involved in making the ink for ribbons and the coating for carbon paper are discussed. No formulas are given for either the ink or the coating because none that can be regarded as up to date are available.

U. S. Gov., Federal Specification UU-P-151a. Amendment 3; 1940. Paper; Carbon, Light-Weight (Typewriter), Black. Covers one grade only, light-weight, suitable for making more than four carbon copies at one time on a standard typewriter. Gives requirements for stock, weight-coated, coating, serviceability, and manifolding; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-156a. Amendment 3; 1940. Paper; Carbon, Standard-Weight (Typewriter), Black. Covers one grade and weight, for use in making not more than four carbon copies at one time on a standard typewriter. Gives requirements for stock, weight-coated, coating, serviceability, and manifolding; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 53P19c; 1944. Paper; Carbon, Hectograph.

U. S. Gov., Treasury Dept. Procurement Div. No. 590; 1942. Paper; Carbon, Typewriter, Black. Covers light-weight and standard-weight. Gives requirements for curling, suitability, bid samples, comparison sample, stock, weight-decoated, coating, serviceability and manifolding; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-G-56; 1932. Addressograph Carbon Paper, Size 6 x 16 in.

U. S. Gov., Veterans Administration. Specification VA-G-57; 1932. Addressograph Carbon Paper, Size 9 1/4 in. x 15 3/4 in.

U. S. Gov., Veterans Administration. Specification VA-G-58; 1932. Billing Machine Carbon Paper; Flat, 14 x 17 in.

U. S. Gov., Veterans Administration. Specification VA-G-92; 1932. Billing Machine Carbon Paper; Flat, 8 1/2 x 17 in.

U. S. Gov., Veterans Administration. Specification VA-G-120; 1934. Roll Carbon Paper; Single Ply, 15 1/2 in.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, see 470.1.

476.22 Cigarette Paper

References.—Definitions and classification, *see* 470.1.

476.23 Electrical Insulating Tissue Paper

References.—Methods of testing electrical insulating paper, *see* 719.52; definitions, *see* 470.1.

476.24 Pattern Paper

References.—Standard pattern sizes, *see* 311.2; definitions and classification, *see* 470.1..

476.25 Stereotyping Paper, Tissue and Molding Paper

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

476.3 SANITARY TISSUES

476.31 Paper Napkins

American Hospital Assn., 55-22. Paper Table Napkins. Covers one grade. Based on U. S. Gov. Federal Specifications UU-N-106 for Paper Table Napkins and UU-P-31a for General Specifications for Paper.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R46-39; 1939. Tissue Paper. Includes the adopted sizes and weights of standard plain tissue, full crepe, semicrepe, and oversize napkins. Sponsored by the Tissue Assn.

U. S. Gov., Federal Specification UU-N-106a; 1944. Napkins; Table, Paper. Covers one grade. Gives requirements for workmanship, size, weight, bursting strength, finish, color, general appearance, and folding; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-G-67b; 1934. Napkins; Paper, Flat (Tray Covers) 16 x 22 in.

U. S. Gov., Veterans Administration. Specification VA-G-68a; 1934. Napkins; Paper, Size 13 x 13 in., (Folded).

References.—Definitions and classification, *see* 470.1.

476.32 Toilet Paper

American Hospital Assn., 55-40. Roll (Round and Oval) and Sheet Tissue Toilet Paper. Covers three types.

Based on U. S. Gov. Federal Specifications UU-P-556b for Roll (Round and Oval) and Sheet Tissue Toilet Paper, and UU-P-31a for General Specifications for Paper.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R46-39; 1939. Tissue Paper. This recommendation covers stock varieties of tissue paper for wrapping tissue, roll toilet tissue, interfolded toilet tissue, and paper napkins. Gives detail requirements relative to content, sheet sizes, weight of paper, and packing. Sponsored by the Tissue Assn.

U. S. Gov., Federal Specification UU-P-556b; 1937. Amendment 1; 1943. Paper; Toilet, Tissue, Roll (Round and Oval) and Sheet. Covers three types—(I) roll, round, (II) sheet, and (III) roll, oval. Gives requirements for weight, bursting strength, absorption, packages, and rolls; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions and classification, *see* 470.1.

476.4 TISSUE WRAPPING PAPER

U. S. Gov., Army Air Forces. Specification 17004-A; 1941. Paper; Wrapping (No. 1 Manila Tissue).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R46-39; 1939. Tissue Paper. This recommendation covers stock varieties of tissue paper for wrapping tissue, roll toilet tissue, interfolded toilet tissue, and paper napkins. Specific detail requirements are given relative to content, sheet size, weight of paper, and packing, as well as details for wrapping and marking. Sponsored by the Tissue Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R125-31; 1931. Waxed Tissue Paper. This recommendation sets forth requirements on weight of raw stock and of finished material, melting point of wax, for two grades of which one is made from bleached all sulphite tissue, accepted number of standard sizes, sheets per ream or unit, and method of packing, for waxed sheet tissue, sheet lunch rolls, lunch envelopes, butter wraps, and continuous household rolls. Initiated by American Waxed Paper Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS44-32; 1932. Apple Wraps. This standard is for dry and oiled paper apple wraps. Detail requirements are given for size, weight, bursting and tensile breaking strength. Included, also, are methods of test, packing, and marking. Initiated by Apple Growers Assn.

References.—Sanitary wrapping paper, paraffin paper, *see* 477.5; definitions and classification, *see* 470.1.

476.9 MISCELLANEOUS TISSUE PAPER

U. S. Gov., Federal Specification UU-P-313a; 1943. Paper; Lens, Tissue. Covers one type and grade, suitable, both wet and dry, for cleaning optical instruments and for other cleaning purposes requiring high-grade tissues. Gives requirements for stock, ash, acidity, weight, tensile strength, stretch, absorption, and size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 53P21; 1940. Paper; Tissue.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1; paraffin paper, waxed tissue paper, *see* 477.5.

477. WRAPPING PAPER

Technical Assn. of the Pulp and Paper Industry. Creasing Quality of Paper, Tentative Standard T 446 sm-42; 1942. To determine ability of wrappers to remain in position after being folded by mechanical wrapping equipment. Covers apparatus, test specimen, procedure, and report.

U. S. Gov., Federal Specification UU-P-611; 1942. Paper; Wrapping, Dispensary. Covers one grade and two types—(I) white and (II) blue. Gives requirements for weight, finish, size, and bursting strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Tissue wrapping paper, *see* 476.4.

477.1 BOGUS WRAPPING PAPER

References.—Definitions and classification, *see* 470.1.

477.2 MANILA WRAPPING PAPER

U. S. Gov., Gov. Printing Office. Manila Paper—Chemical Wood Manila, 1944. Gives requirements for stock, weight, folding endurance, bursting strength, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Manila Paper—Hemp and/or Jute and/or Sisal Manila, 1944. Gives requirements for stock, weight, folding endurance, bursting strength, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Manila Paper—Wood Manila, 1944. Gives requirements for weight, bursting strength, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-87A; 1942. Paper; Wood, Manila, Waterproof.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1; sulphite manila paper, *see* 477.7.

477.3 NUMBER ONE KRAFT PAPEP

American Hospital Assn., 55-28. Wrapping Kraft Paper. Covers No. 1 and No. 2 grades, flat cut and rolls. Based on U. S. Gov. Federal Specifications UU-P-268a for Wrapping Kraft Paper and UU-P-31a for General Specifications for Paper.

U. S. Gov., Federal Specification UU-P-268b; 1943. Paper; Kraft, Wrapping. Covers four grades of kraft wrapping paper—(A) No. 1, (B) No. 2, (C) No. 3, and (D) imitation. Gives requirements for materials, cut, size, sizing, and comparison samples; details for each grade showing stock, weight, folding endurance, and bursting strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-271a; 1943. Paper; Kraft, Wrapping, Waterproofed. Covers a large number of types. Gives requirements for material, workmanship, stock, purchase basis, cut, sizes, bleeding, construction, details, tensile strength, water resistance, stretch, weight of asphaltum, weight of paper, methods of sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-77; 1933. Paper; Kraft, Asphalt, Impregnated.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

477.4 NUMBER TWO KRAFT PAPER

American Hospital Assn., 55-28. Wrapping Kraft Paper. Covers No.1 and No.2 grades, flat cut and rolls. Based on U. S. Gov. Federal Specifications UU-P-268a for Wrapping Kraft Paper and UU-P-31a for General Specifications for Paper.

U. S. Gov., Army Air Forces. Specification 17002-A; 1941. Paper; Wrapping, Kraft, Waxed.

U. S. Gov., Federal Specification UU-P-268b; 1943. Paper; Kraft, Wrapping. Covers four grades of kraft wrapping paper—(A) No.1, (B) No.2, (C) No.3, and (D) imitation. Gives requirements for materials, cut, size, sizing, and comparison samples; details for each grade showing stock, weight, folding endurance, and bursting strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-271a; 1943. Paper; Kraft, Wrapping, Waterproofed. Covers a large number of types. Gives requirements for material, workmanship, stock, purchase basis, cut, sizes, bleeding, construction, details, tensile strength, water resistance, stretch, weight of asphaltum, weight of paper, methods of sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Kraft Paper—No.2 Kraft, 1944. Gives requirements for stock, weight, folding endurance, bursting strength, color, and finish. Developed by Joint Committee of Congress on Printing.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-88; 1936. Paper; Kraft, Duplex, Waterproof Wrapping, for Ammunition Container.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

477.5 SANITARY WRAPPING PAPER, PARAFFIN PAPER

American Hospital Assn., 55-31. Paraffined Wrapping Kraft Paper. Covers three types. Based on U. S. Gov. Federal Specifications UU-P-270 for Paraffined Wrapping Kraft Paper and UU-P-31a for General Specifications for Paper.

American Society for Testing Materials, D 590-42; 1942. Technical Assn. of Pulp and Paper Industry Standard Method T 405m-40. Method of Test for Paraffin Content of Waxed Paper. For quantitative method of determining amount of paraffin in waxed paper, but not for paraffin-sized papers; requirements for test specimen, apparatus, reagents, and outline of procedure.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R125-31; 1931. Waxed Tissue Paper. This recommendation sets forth requirements on weight of raw stock and finished material, melting point of wax, for two grades of which one is made from bleached all sulfite tissue, accepted number of standard sizes, sheets per ream or unit, and method of packing for waxed sheet tissue, sheet lunch rolls, lunch envelopes, butter wraps, and continuous household rolls. Initiated by American Waxed Paper Assn.

U. S. Gov., Federal Specification UU-P-252; 1940. Paper, Impervious; Paraffined (for Surgical Dressings). Covers one type and grade, and three sizes—(1) 24 in. by 5 yd., (2) 24 in. by 50 yd., and (3) 18 in. by 300 yd. Gives requirements for color, paraffin content, weight, bursting strength, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-270; 1936. Amendment 2; 1940. Paper; Kraft, Wrapping, Paraffined. Covers three types—(A) paraffin-impregnated, creped one direction; (B) paraffin-impregnated, creped both directions; and (C) paraffin-impregnated, uncreped. Gives requirements for tensile strength, content of paraffin, and stretch; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-78; 1932. Paper; Paraffin.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1; waxed paper linings for shipping boxes, *see* 957.2.

477.6 SCREENINGS

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Paper. Include 11 varieties of paper, weight requirements, standard sizes for wrapping smoked meats, for grease-proof, vegetable parchment, glassine, packers' manila, gray ham paper, screenings, water and dry finished fiber, kraft, and transparent cellulose papers.

References.—Definitions and classification, *see* 470.1.

477.7 SULPHITE WRAPPING PAPER

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

477.8 WATERPROOF WRAPPING PAPER

U. S. Gov., Army-Navy Aeronautical Specification AN-B-18; 1944. Barriers; Waterproof (Materials for).

U. S. Gov., Federal Specification UU-P-271a; 1943. Paper; Kraft, Wrapping, Waterproofed. Covers a large number of types. Gives requirements for material, workmanship, stock, purchase basis, cut, sizes, bleeding, construction, details, tensile strength, water resistance, stretch, weight of asphaltum, weight of paper, methods of sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., Joint Army-Navy Specification, JAN-P-125; 1944. Packaging and Packing for Overseas Shipment—Barrier-Materials, Waterproof, Flexible.

References.—Definitions and classification, *see* 470.1.

477.9 MISCELLANEOUS WRAPPING PAPERS

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Paper. Include 11 varieties of paper, weight requirements, standard sizes for wrapping smoked meats, for grease-proof, vegetable parchment, glassine, packers' manila, gray ham paper, screenings, water and dry finished fiber, kraft, and transparent cellulose papers.

Society of Automotive Engineers. Aeronautical Material Specification 2574; 1943. Preservations of Engines (Limited Period). Provides preparing aircraft engines to resist corrosion during shipment and limited storage under favorable conditions. Material and equipment, preliminary operation, preparation for storage procedure, recommended procedure for represervation, and general.

Society of Automotive Engineers. Aeronautical Material Specification 3540; 1943. Wrapper; Greaseproof Paper (Single-Ply). Primarily a coated or impregnated paper base sheet for a greaseproof and noncorrosive material for use as a primary wrapper in contact with highly finished and corrodible metallic surfaces, which usually will be coated with an oil or preservative compound. General and detail requirements, test procedures, quality, reports, marking, approval, and rejection. Similar to Army-Navy Aeronautical Specification AN-P-12.

Society of Automotive Engineers. Aeronautical Material Specification 3542; 1944. Wrapper; Greaseproof Paper (Laminated). Covers material, application, general requirements, detail requirements, tests, quality, reports, marking, approval, and rejections. Similar to Army-Navy Aeronautical Specification AN-P-12.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-12b-1; 1945. Paper; Greaseproof Wrapping.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-18; 1944. Wadding; Creped Cellulose.

U. S. Gov., Federal Specification UU-B-71; 1933. Bands; Paper, Shirt, Laundry. Covers one type. Gives requirements for construction, composition, adhesive material, and size; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Joint Army-Navy Specification JAN-P-121; 1944. Barrier-Material; Greaseproof.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 5C-11-70A; 1941. Felt; Protecting, Paper, for Use in Primer Protector Cap.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-446A; 1934. Paster, Types MC-73 and MC-73A, Paper, for Cable Splicing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

478. WRITING PAPER, DRAWING AND CHART PAPER

478.1 COMMERCIAL WRITING PAPER

478.10 General Items

Writing Paper Manufacturers Assn. Trade Customs of the Writing Paper Industry, 1940. Covers sizes, broken cartons, colors, differentials for special finishes, variation in weight and billing, cores, marking, over-runs and under-runs, special watermarks, cutting to small sizes, tolerance in trimming, folding and punching, packing differentials, claims, quotations, samples, make and hold orders, freight conditions, quantity differentials, terms of sale, commissions on paper sold through merchants, light weights, and substance weights; tables showing weights for cut sizes and standard weights; and supplementary trade customs.

478.11 Bond Writing Paper

American Hospital Assn., 55-25. White and Colored Bond Paper. Covers three types. Based on U. S. Gov. Federal Specifications UU-P-121c for White and Colored Bond Paper and UU-P-31a for General Specifications for Paper.

U. S. Gov., Federal Specification UU-P-121c; 1939. Amendment 3; 1943. Paper; Bond, White and Colored. Covers four types—(A) 25 percent white and colored, (B) 50 percent white and colored, (C) 75 percent white, and (D) chemical wood white and colored. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, color, finish, ruling, writing, and erasing qualities; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Gov. Printing Office. Bond Paper—Chemical Wood Bond, White and Colored, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Bond Paper—25 Percent Bond, White and Colored, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Bond Paper—50 Percent Bond, White and Colored, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Bond Paper—75 Percent White Bond, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Bond Paper—100 Percent Declaration Bond for Permanent Records, 1944. Gives requirements for stock, alpha cellulose, copper number, ash, acidity, sizing, weight, folding endurance, bursting strength, writing quality, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Bond Paper—100 Percent White Bond for Permanent Records, 1944. Gives requirements for stock, alpha cellulose, copper number, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

478.12 Flat Writing Paper

U. S. Gov., Federal Specification UU-P-641; 1933. Amendment 6; 1943. Paper; Writing. Covers one type and grade. Gives requirements for size, writing quality, trimming, weight tolerance, color, finish, formation, cleanliness, ruling, and writing qualities; stock, ash, weight, folding endurance, bursting strength, and brightness; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions and classification, *see* 470.1.

478.13 Ledger Paper

American Hospital Assn., 55-34. Ledger Paper. Covers two types. Based on U. S. Gov. Federal Specifications UU-P-288 for Ledger Paper and UU-P-31a for General Specifications for Paper.

U. S. Gov., Federal Specification UU-P-288; 1933. Amendment 6; 1943. Paper; Ledger. Covers two types—(A) 25 percent ledger, white and colored; and (B) wood fiber ledger, white and colored. Gives requirements for size, writing, ruling, and erasing qualities, trimming, weight tolerance, color, finish formation, cleanliness, stock, ash, acidity, sizing, weight, folding endurance, bursting strength, and watermark; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Ledger Paper—Chemical Wood White Ledger, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Ledger Paper—25 Percent Ledger, White and Colored, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Ledger Paper—50 Percent Ledger, White and Colored, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Ledger Paper—75 Percent Ledger, White and Colored, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Ledger Paper—100 Percent White Ledger For Permanent Records, 1944. Gives requirements for stock, alpha cellulose, copper number, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, writing, and erasing qualities, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

478.14 Linen Paper

References.—Definitions and classification, *see* 470.1.

478.15 Papeterie Paper

References.—Definitions and classification, *see* 470.1.

478.16 Parchment Deed Paper

U. S. Gov., Gov. Printing Office. Bond Paper—100 Percent Parchment Deed For Permanent Records, 1944. Gives requirements for stock, alpha cellulose, copper number, ash, acidity, sizing, weight, folding endurance, bursting strength, ruling, and writing qualities; color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

478.17 Railroad Writing Paper

References.—Definitions and classification, *see* 470.1.

478.18 Wedding Writing Paper

References.—Definitions and classification, *see* 470.1.

478.19 Miscellaneous Commercial Writing Paper

U. S. Gov., Federal Specification UU-P-21a; 1943. Pads; Memorandum. Covers two types—(I) chemical wood, and (II) ground wood. Gives requirements for sizes, material, workmanship, number of sheets, padding and back, ruling, comparison sample, writing quality, stock, weight, and bursting strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-258a; 1942. Amendment 2; 1943. Paper; Index. Covers three grades—(1) 50 percent index, (2) 25 percent index, and (3) wood fiber index. Gives requirements for material and workmanship, size, trimming, ply, ruling, color, finish, detail requirements, methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-P-301; 1935. Amendment 3; 1943. Paper; Legal-Cap, Ruled. Covers one type and grade. Gives requirements for materials, workmanship, writing quality, color, finish, formation, cleanliness, stock, weight, folding endurance, bursting strength, ash, and dimensions and ruling; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Index Paper—Chemical Wood White and Colored Index, 1944. Gives requirements for stock, ash, acidity, sizing, weight. bursting strength, thickness, ply, ruling, writing, and erasing qualities, color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Writing Paper—Ground Wood Writing, White and Colored, 1944. Gives requirements for stock, ash, weight, bursting strength, ruling, and writing quality; color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Writing Paper—U.S.M.O. Writing, White and Blue, 1944. Gives requirements for stock, ash, weight, folding endurance, bursting strength, writing quality, color, finish, formation, cleanliness, and watermark. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Index Paper—50 Percent Index, White and Colored, 1944. Gives requirements for stock, ash, acidity, sizing, weight, bursting strength, thickness, ply, ruling, writing, and erasing qualities; color, finish, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Index Paper—100 Percent White Index for Permanent Records, 1944. Gives requirements for stock, alpha cellulose, copper number, ash, acidity, sizing, weight, bursting strength, thickness, ply, ruling, writing, and erasing qualities; color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; safety writing paper, *see* 478.33; definitions and classification, *see* 470.1.

478.2 DUPLICATING PAPER

U. S. Gov., Federal Specification UU-P-231; 1943. Paper; Duplicator, Liquid Process. Shall be of the following types: Types I—Master paper and Type II—Copy paper. Covers size, color, finish, formation, cleanliness, and bid sample. Type I—stock, weight, bursting strength, thickness, curl, and copying quality. Type II—stock, weight, ash, mineral pigment, bursting strength, thickness, opacity contrast ratio, writing quality, curl, and copying quality. Methods of sampling, inspection, tests, packaging, packing, and marking for shipment.

478.21 French Folio Paper

References.—Definitions and classification, *see* 470.1.

478.22 Manifold Paper (Includes Stencil Paper)

U. S. Gov., Federal Specification UU-P-328a; 1934. Amendment 7; 1943. Paper; Manifold. Covers five types—(A) 100 percent white manifold; (B) 50 percent white and colored manifold; (C) 50 percent white glazed manifold; (D) 25 percent white and colored manifold; (E) chemical wood white and colored manifold. Gives requirements for size., writing quality, trimming, weight tolerance, color, finish, formation, cleanliness, stock, ash, acidity, sizing, weight, folding endurance, and bursting strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-543a; 1939. Amendment 1; 1940. Paper; Stencil, Board. Suitable for use with brush and ink. Covers two types—(I) unoiled, and (II) oiled. Gives requirements for weight, thickness, and bursting strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-P-545; 1943. Paper; Stencil, Duplicating-Machine, Dry Process. Covers one type, one grade, and one class. Gives requirements for materials and workmanship, backing sheet, cushion sheets, printing, sizes and scale numbers, odor, tensile strength, stretch, moisture resistance, permanence, opacity, finish, cut-outs and type filling, correction properties, use with stylus, and duplicating quality; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Manifold Paper—Chemical Wood Manifold, White and Colored, 1944. Gives requirements for stock, ash, acidity, weight, bursting strength, writing quality, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Manifold Paper—50 Percent Manifold, White and Colored, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, writing quality, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Manifold Paper—50 Percent White Glazed Manifold, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, writing quality, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Manifold Paper—100 Percent White Manifold, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, writing quality, color, finish, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Veterans Administration. Specification VA-G-32a; 1936. Paper; Stencil, Oilboard.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

478.23 Onionskin Paper

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-49B; 1942. Paper; Onionskin.

References.—Definitions and classification, *see* 470.1; manifold paper, *see* 478.22.

478.24 Teletype Paper (Roll and Tape)

U. S. Gov., Federal Specification UU-P-547c; 1944. Amendment 1; 1944. Paper; Teletype, Roll and Tape.

Covers three types: (I) roll-form, ungummed, for use with teletype and duplicating inks (classes A—without carbon paper, B—interleaved with carbon paper, and C—auto-copy), (II) tape-form, for use with typewriter ribbon ink (classes A—gummed and B—ungummed), and (III) tape-form, oiled, perforator, for use with automatic teletype apparatus. Gives details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

478.29 Miscellaneous Duplicating Paper

U. S. Gov., Veterans Administration. Specification VA-G-91; 1933. Transcript Paper; Flat and Rolls.

478.3 INDUSTRIAL PAPER

478.31 Chart and Map Paper

U. S. Gov., Federal Specification UU-P-171a; 1943. Amendment 1; 1944. Paper; Chart, 100 Percent, Lithograph-Finish, White. Covers one type and grade. Gives requirements for sizes, material, erasing quality, trimming, surface and finish, sorting, formation, grain, color, cleanliness, writing and printing qualities, stock, alpha cellulose, copper number, ash, moisture content, acidity, sizing, weight, folding endurance, bursting strength, and thickness; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-P-201; 1931. Paper; Cross-Section, Printed, Drawing, and Tracing. Covers two types—(I) drawing, and (II) tracing; and eight classes—(A) profile, (B) cross-section, (C) logarithmic, (D) plan profile, (E) township, (F) coordinate, (G) isometric, and (H) statistical diagrammatic. Gives requirements for colors, printings, rulings, mounting, lines, and ink; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-203; 1931. Paper; Cross-Section, Ruled. Gives requirements for colors, rulings, lines, and ink; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-361; 1944. Paper; Map, High Wet-Strength. Covers one type and grade. Gives requirements for size, material and workmanship, trimming, erasing quality, surface, grain, writing quality, abrasion, blocking, color, finish, formation and cleanliness, stability, bid sample, and details; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Gov. Printing Office. Map Paper—High Wet Strength Map, 1944. Gives requirements for stock, moisture content, acidity, weight, folding endurance, tearing strength, bursting strength, tensile strength, thickness, opacity, finish, water resistance, expansivity, curl, erasing quality, writing quality, wet writability, abrasion, trim, surface, resistance to blocking, color, finish, formation, cleanliness, and packing. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Map Paper—Lithograph-Finish Map, 1944. Gives requirements for stock, ash, moisture content, weight, folding endurance, bursting strength, thickness, finish, surface, color, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Map Paper—50 Percent Lithograph-Finish Map, 1944. Gives requirements for stock, ash, moisture content, acidity, sizing, weight, folding endurance, bursting strength, thickness, finish, surface, color, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Map Paper—75 Percent Lithograph-Finish Map, 1944. Gives requirements for stock, ash, moisture content, acidity, sizing, weight, folding endurance, bursting strength, thickness, finish, surface, color, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Map Paper—50 Percent White Chart, Lithograph-Finish, 1944. Gives requirements for stock, ash, acidity, sizing, weight, folding endurance, bursting strength, thickness, erasing quality, surface and finish, expansivity, finish, moisture resistance, color, finish, and general appearance, and sorting. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Map Paper—100 Percent White Chart, Lithograph-Finish for Permanent Records, 1944. Gives requirements for stock, alpha cellulose, copper number, ash, moisture content, acidity, sizing, weight, folding endurance, bursting strength, thickness, erasing quality, color, surface and finish, formation, and sorting. Developed by Joint Committee of Congress on Printing.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 19-48A; 1937. Paper; Map, Lithograph-Finish, 50 Percent Rag.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

478.32 Drawing Paper

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 10; 1941. Standard Form for National Aircraft Standard Drawings. Gives diagram and notes. Developed by National Aircraft Standard Committee.

U. S. Gov., Federal Specification UU-B-561; 1931. Amendment 1; 1943. Board; Bristol. Covers two types—(I) rough surface and (II) smooth surface; and two grades (A) first and (B) second. Gives requirements for material and workmanship, texture and finish, sizes and thicknesses, and samples; method of inspection and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-216; 1931. Paper; Detail-Drawing. Covers the highest grade, in three types—(I) white detail, (II) buff or cream detail, and (III) manila. Gives requirements for color, stock, weight, bursting strength, folding endurance, formation, and defects; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-226; 1932. Amendment 1; 1943. Paper; Drawing. Covers four types (I) white drawing (highest grade), (II) buff or cream drawing, (III) students' drawing (ordinary grade), and (IV) Whatman type papers (selected best). Gives requirements for finish, quality, stock, weights, mounting, watermarks, samples, and details for each type; methods of inspection and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-52; 1921. Paper; Sketching, 12 1/2 by 13 1/8 in.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

478.33 Safety Writing Paper

U. S. Gov., Gov. Printing Office. Writing Paper—Blue U.S.M.O Safety Writing, 1944. Gives requirements for stock, ash, weight, folding endurance, bursting strength, thickness, writing quality, color, finish, formation, cleanliness, safety properties, and watermark. Developed by Joint Committee of Congress on Printing.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1.

478.34 Sensitizing Paper

Optical Society of America. American Standards Assn., Z38.1.4-1942. Dimensions of Photographic Paper. For leaders for sensitized photographic paper rolls (where leaders are required). Refers to those commonly used for light protective purposes where the length of the leader has no particular bearing on the operation of an exposing machine. Covers geophysical recording roll leaders, photocopy roll leaders, and limit signals for geophysical recording rolls.

Optical Society of America. American Standards Assn., Z38.1.5-1943. Dimensions of Photographic Papers Inch Width Rolls). Gives requirements for width, length, allowance for splices, and method of measuring.

Optical Society of America. American Standards Assn., Z38.1.6-1943. Dimensions of Photographic Papers (Centimeter Size Sheets and Rolls). Gives requirements for nominal size, tolerance, and method of measuring cut sheets and for nominal width, tolerance, length of rolls, allowance for splices, and method of measuring rolls.

Optical Society of America. American Standards Assn., Z38.1.7-1943 to Z38.1.15-1943, inclusive. Dimensions for Amateur Roll Film, Backing Paper, and Film Spools. Gives diagrams and dimensions for amateur roll film and backing paper—numbers 1 to 9, inclusive.

Optical Society of America. American Standards Assn., Z38.2.3. Proposed American Standard Method of Processing for Sensitometry of Photographic Paper. Relates to the exposing and processing, for sensitometric purposes, of "metallic silver image" developing-out photographic paper intended for projection or contact printing of continuous-tone picture negatives. Covers condition of the sample before testing, exposure, processing, and measurement of density.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R98-43; 1943. Photographic Paper. This recommendation establishes a simplified schedule of cut and roll sizes of photographic paper.

U. S. Gov., Federal Specification UU-P-79b; 1943. Paper; Blueprint (Sensitized and Unsensitized). Covers two types—(I) sensitized and (II) unsensitized, and four grades—(1) 100 percent rag, (2) 50 percent rag, (3) 25 percent rag, and (4) wood fiber. Gives requirements for stock, size, weight, folding endurance, tearing strength, and wet tensile strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-141a; 1937. Paper; Brownprint (Sensitized, and Sensitized and Transparent). Covers one grade. Gives requirements for stock, weight, sizes, and opacity; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-416; 1932. Paper; Photographic, Black-Line. Suitable for making black-line prints which are subject to severe and frequent handling. Gives requirements for weight, tensile strength, and chemical properties (raw stock); methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-P-418; 1932. Paper; Photographic, Negative. Suitable for making clear, sharp, black negative prints. Gives requirements for weight, wet tensile strength, chemical properties, and stock; methods for sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-T-431; 1933. Tissue; Dry-Mounting, Photographic. Covers one grade, consisting of a thermoplastic adhesive coating applied to the front and back surfaces of a paper support. Gives requirements for support, coating, and thickness; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 19-67; 1944. Paper; Direct-Positive Sensitized (Dry Processing).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-385; 1944. Paper; Reflex-Copy Photographic.

U. S. Gov., U. S. Army, Signal Corps. Specification 46-3; 1937. Paper; Type PH-79, Oscillograph, Sensitized.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1; photographic blotting paper, *see* 471.1; litmus paper, *see* 839.9; blue print cloth, *see* 392.12.

478.35 Tracing Paper

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C63; 1917. Specification of the Transparency of Paper and Tracing Cloth. Describes a standard method of specifying the transparency, using principle of contrast ratio; description of apparatus and method of test, directions for making application test.

U. S. Gov., Federal Specification UU-P-561c; 1942. Paper; Tracing. Covers three types—(I) white, rag; (II) white, sulphite; and (III) white, transparentized;

and two classes—(1) smooth surface, (2) slightly grained surface. Gives requirements for weight, fiber composition, folding endurance before accelerated aging, retention of folding strength after aging, and opacity; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; definitions and classification, *see* 470.1; tracing cloth, *see* 392.12.

479. MISCELLANEOUS SPECIFICATIONS FOR PAPER

U. S. Gov., Federal Specification UU-L-56; 1941. Labels; Vial. Covers one type, one grade, and two sizes—large and small. Gives sizes and detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

479.1 TRANSFER PAPER

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-49; 1921. Paper; Transfer, Nontransparent, 17 by 22 In.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-53; 1921. Paper; Transfer, Transparent, 17 by 22 In.

References.—Definitions and classification, *see* 470.1.

479.2 GUMMED PAPER

American Hospital Assn., 55-43. Gummed Kraft Paper Tape. Covers three grades. Based on U. S. Gov. Federal Specifications UU-T-111 for Gummed Kraft Paper Tape and UU-P-31a for General Specifications for Paper.

U. S. Gov., Army Air Forces. Specification 17000D-4; 1944. Tape; Masking, Paper Backed.

U. S. Gov., Army Air Forces. Specification 17010(1); 1941. Paper; Gummed, White.

U. S. Gov., Army Air Forces. Specification 17016(1); 1944. Paper; Adhesive, Waterproof.

U. S. Gov., Army Air Forces. Specification 17019; 1943. Tape; Water Resistant Adhesive (Paper-Plastic).

U. S. Gov., Army-Navy Aeronautical Specification AN-T-12a; 1944. Tape; Adhesive Moisture Resistant.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R114-30; 1930. No. 1 Kraft Paper Sealing Tape. This recommendation establishes a standard schedule of stock varieties of sealing tape, with weight, bursting strength, length per roll, width, and packaging requirements for each variety. Initiated by Gummed Industries Assn.

U. S. Gov., Federal Specification UU-T-111a; 1944. Tape; Paper, Gummed (Kraft). Covers three grades—(A) light weight, for light packages; (B) medium weight, for medium-size packages; and (C) heavy weight, for heavy bulky packages. Gives requirements for stock, workmanship, adhesive, tearing resistance, tensile strength, rolls, weight, bursting strength, width and length; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-T-101b; 1942. Amendment 2; 1944. Tape, Gummed; Mending, Reinforcing, and Securing. Covers five types (water soluble gum and water-insoluble gum). Gives requirements for material and workmanship, construction, tensile strength, adhesion, opacity, blocking, aging quality, and sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Gov. Printing Office. Miscellaneous Paper—White Gummed, 1944. Gives requirements for stock, weight, curl, color, finish, and adhesive quality. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Joint Army-Navy Specification JAN-A-101; 1944. Adhesive; Water-Resistant, for Sealing Fiberboard Boxes.

U. S. Gov., Joint Army-Navy Specification JAN-P-128; 1944. Packaging and Packing for Overseas Shipment. Tape; Water Resistant, Gummed.

U. S. Gov., Marine Corps Specification. Adopted, 1939. Flypaper; Ribbon.

U. S. Gov., Marine Corps Specification. Adopted, 1942. Tape; Paper, Gummed, 3-In. (Emergency Alternate).

U. S. Gov., Navy Dept. Specification 53T6; 1939. Tape; Masking.

References.—Methods of testing, *see* 470.3.

479.3 PAPER FOR ABRASIVE PAPERS

References.—Standard sizes, methods of testing, *see* 470.2, 470.3.

479.4 MISCELLANEOUS PAPERS USED IN PRINTING PROCESS

U. S. Gov., Federal Specification G-L-41; 1940. Labels; Microslide. Covers one type, grade, and class. Gives detail requirements as to weight, gumming, color, size, writing quality, and assembly; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Gov. Printing Office. Miscellaneous Paper—High-Finish Red Sulphite, 1944. Gives requirements for stock, weight, bursting strength, writing quality, color, and finish. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Gov. Printing Office. Printing Paper—50 Percent Machine-Finish Lithograph, 1944. Gives requirements for stock, acidity, sizing, weight, bursting strength, thickness, surface and finish, color, formation, and cleanliness. Developed by Joint Committee of Congress on Printing.

U. S. Gov., Navy Dept. Specification 53P7c; 1938. Paper; Templet.

References.—Standard sizes, methods of testing, *see* 470.2, 470.3; stereotype tissue and molding paper, *see* 476.25; definitions and classification, *see* 470.1.

480-489 BOOKS AND OTHER PRINTED MATTER

481. BOOKS AND PAMPHLETS

Book Manufacturers Institute, Inc. Official Minimum Manufacturing Standards and Specifications for Textbooks, 1939. Covers class, definitions, paper, margins, general, signatures, end papers, reinforcements, inserts, stitching or sewing, tapes, rounding and backing, casing-in and drying, procedure for testing, binders board, pyroxylin impregnated fabrics, pyroxylin coated fabrics, standard grades of impregnaged fabrics, and standard grades of coated fabrics.

Paper Stationery and Tablet Manufacturers Assn. Simplification and Standardization of Sizes, 1939. Includes standard size recommendations for standard sizes for the principal categories of school paper and school blank books (wire-bound, sewed, glued, or the like) with a few commercial items.

Society of Automotive Engineers. Aeronautical Standard 79; 1942. Catalogs, Spare Parts, for Aircraft Engines. For the purpose of identification, procurement, and stocking of spare parts. Covers two types—(1) final (illustrated) and (2) preliminary (unillustrated). Gives general requirements for both types, symbols, binding, part numbers, and detail requirements for both types.

Society of Automotive Engineers. Aeronautical Standard 80; 1942. Catalogs, Overhaul Tools, for Aircraft Engines. For the purpose of identification, procurement, and stocking of tools. Covers two types—(1) final (illustrated) and (2) preliminary (unillustrated). Gives general requirements for both types, symbols, bindings, and detail requirements for both types.

Society of Automotive Engineers. Aeronautical Standard 164; 1943. Service Manuals for Aircraft Engines. For the purpose of supplying all necessary instructions to accomplish the proper operation and service maintenance of the particular aircraft engines for which the manual is written. Covers scope, general requirements, and detail requirements.

Society of Automotive Engineers. Aeronautical Standard 165; 1943. Overhaul Manuals for Aircraft Engines. For the purpose of supplying all necessary instructions to accomplish the complete overhaul of the aircraft engines for which the manual is written. Covers scope, general requirements, and detail requirements.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-9a; 1944. Bulletins; Contractor Service, for Airplanes, Engines, and Accessories.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-84-1; 1944. Catalogs; Tools.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-85-1; 1944. Catalogs; Parts, for Airplanes, Engines, and Accessories.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-100a; 1944. Catalogs; Radio and Radar Equipment Spare Parts.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-1a-1; 1943. Handbooks; Structural Repair (for Airplanes).

U. S. Gov., Army-Navy Aeronautical Specification AN-H-7a; 1944. Handbooks and Catalogs; Aircraft, Engines and Accessories (General Specification for Preparation of).

U. S. Gov., Army-Navy Aeronautical Specification AN-H-8a-1; 1945. Handbooks; Pilots Flight Operating Instruction.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-9-1; 1943. Handbooks; Service Instruction (for Aircraft Engines).

U. S. Gov., Army-Navy Aeronautical Specification AN-H-10; 1942. Handbooks; Overhaul Instruction (for Aircraft Engines)

U. S. Gov., Army-Navy Aeronautical Specification AN-H-11; 1942. Handbooks; Operation and Service Instruction (for Aircraft Accessories, Aircraft Engine Accessories and Related Equipment).

U. S. Gov., Army-Navy Aeronautical Specification AN-H-12; 1942. Handbooks; Overhaul Instruction (for Aircraft Accessories, Aircraft Engine Accessories and Related Equipment).

U. S. Gov., Army-Navy Aeronautical Specification AN-H-13-1; 1943. Handbooks; Erection and Maintenance Instructions (for Airplanes).

U. S. Gov., Army-Navy Aeronautical Specification AN-H-19a; 1944. Handbooks; Radio and Radar Equipment Operating.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-20a; 1944. Handbooks; Radio and Radar Equipment Maintenance.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-21a; 1944. Handbooks and Catalogs; Radio and Radar Equipment, (General Specification for Printing of).

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Book, Cook, Fire-Camp.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R84-28; 1928. Composition Books. This recommendation establishes a schedule of standard stock varieties covering two grades of ground wood paper, four grades of writing paper with writing-with-ink test, four grades or weights of cover stock, number of leaves for crown size and demy size.

U. S. Gov., Federal Specification G-D-331; 1942. Dictionaries; English. Covers three types—(I) office in two classes (A) 45,000 vocabulary terms and (B) 70,000 vocabulary terms; (II) general use, 100,000 vocabulary terms; and (III) unabridged in two classes (A) 400,000 vocabulary terms and (B) 550,000 vocabulary terms. Gives requirements for material and workmanship, method of indicating pronunciation, etymologies, type, illustrations, definitions, abbreviations, foreign work and phrases, proper names, thumb index, and general features; detail requirements for vocabulary and binding of each type and class; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification, JAN-B-42; 1944. Book; Song, and Service (for Army and Navy Chaplains) (Field Service and Sea Duty).

U. S. Gov., Joint Army-Navy Specification, JAN-H-37; 1944. Hymnals.

U. S. Gov., Navy Dept. Specification 18B7; 1944. Books; Instruction (Instruments, Electrical, for Navigational Purposes) (Shipboard Use).

U. S. Gov., U. S. Army, Medical Dept. Specification 19-11; 1939. Book; Prescription Filing.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-55; 1939. Book; Note, Manifolding, Binder.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-61; 1939. Book; Note, Manifolding, Filler.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-63; 1940. Book; Blank, Ledger.

References.—Standard paper sizes, methods of testing, *see* 470.2, 470.3.

482. MAPS, CHARTS, AND MUSIC

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Preparation of Maps and Profiles. Covers preparation of certain maps and profiles of the property and available methods of reproducing copies of the same. Gives details of maps and profiles required showing charts.

American Society of Mechanical Engineers. American Standards Assn., Z 15.1-1932. Engineering and Scientific Charts for Lantern Slides. A valuable set of rules for drawing the original charts and for their reproduction as lantern slides. Standard also specifies types and sizes of lettering, different line widths, and sizes of symbols commonly used in graphs. An appendix contains a table of commercial lettering templates and lettering pens with which charts may be easily reproduced in the manner recommended.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-102; 1943. Charts; Maintenance Instruction

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Alinement Charts for Duff Moisture.

References.—Chart and map paper, *see* 478.31; navigational and topographical symbols for map making, *see* 910.

483. LITHOGRAPHIC PRINTS

484. BOOKLETS

485. DRAWINGS AND BLUEPRINTS

U. S. Gov., Army-Navy Aeronautical Specification AN-D-11-1; 1944. Drawings and Data Lists; Reproducible and Other Copies of, for Aircraft, Engines, Accessories, Auxiliary Equipment and Special Tools.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-40033-H; 1944. Drawings and Drawing List (Originals).

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-40100B; 1943. Drawing and Data Lists, Preparation of, for Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-40103B; 1943. Drawing and Data Lists, Preparation of, for Aircraft Engines, Aircraft Accessories, and Other Auxiliary Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1588; 1944. Manufacturer's Drawings (for Signal Corps Equipment).

489. MISCELLANEOUS PRINTED MATTER

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Bridge and Building Records (Numbering of Buildings). Gives details and shows prints of various types of forms.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Cost-Keeping Methods, Statistical Records, and Forms for Analyzing Expenditures for Assistance in Controlling Expenditures. Gives details and shows prints of various types of forms.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Rail Record Forms. The following forms are considered essential and are recommended for keeping records of rail purchased and in track. Gives forms for reporting results of mill inspection and shipments, for reporting and recording failures in track, for reporting heat numbers of rail in track, for reporting and recording measurements of rail batter, and miscellaneous.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railroad Engineering, April 1943. Railway and Structures—Records and Reports. Gives details and shows prints of various types of forms.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for the Design, Arrangement, and Printing of Forms. For general records and reports. Gives details and shows prints of various types of forms.

American Standards Assn., Z 39.1-1943. Reference Data and Arrangement of Periodicals. Includes data for identification, contents, pagination, illustrations, errata, bibliographic information, title page, table of contents, index, policy changes and mergers, supplements, and society and institutional publications.

National Assn. of Purchasing Agents, Inc. Purchase Contract Clauses, 1934. Reference manual of typical clauses for purchase contracts.

National Assn. of Purchasing Agents, Inc. Purchase Order Forms, 1932. A survey and analysis of forms most commonly used.

National Assn. of Purchasing Agents, Inc. Purchase Requisition Forms, 1937. A survey and analysis of forms most commonly used.

Tag Manufacturers Institute. Manual of Standard Specifications. Pin Ticket Stocks and Styles of Pin Tickets, 1940. Gives TMI designation, composition, weight, thickness, strength, tolerances, and various styles of card pin tickets and folding pin tickets.

Tag Manufacturers Institute. Manual of Standard Specifications, 1938. Presents standard specifications of essential tag materials. Gives suggested standard procedure for testing of tag stocks, including sampling, conditioning, and physical tests; and conditions under which specifications are standardized including specifications for tag stocks (paper stocks and cloth stocks) and specifications for strings.

Tag Manufacturers Institute. Manual of Standard Specifications. Standard Sizes of Tags, 1939. Gives standard sizes, dimensions, and areas of shipping tags.

Tag Manufacturers Institute. Manual of Standard Specifications. Stock Pin Tickets, 1938. Gives TMJ designation, dimensions, ruling, diameter of wire, and length of pins, for card tickets and folding tickets.

Tag Manufacturers Institute. Manual of Standard Specifications. TMI Designations and Illustrations, 1939. Gives styles of card tickets and illustrations of various card pin tickets;styles and illustrations of detachable, nondetachable, and single pin folding tickets; and illustration of kimflex tickets.

Tag Manufacturers Institute. Sizes of Marking Tags and Jewelry Tags, 1939. Gives sizes and designs of marking tags, jewelry tags, and metal rim tags.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-9-1; 1944. Maintenance Parts Breakdown; Airplane.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-13; 1943. Marking and Tagging; Airframe, Engine, and Accessory Maintenance Parts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R34-24; 1924. Warehouse Forms. Simplified practice recommended and accepted by industry establishing standard forms, their dimensions, the arrangement and content of printed matter, for rate quotation form; over, short, and damage report; warehouse receipts, notice of order filled, bill of lading, account of stock, household goods form, packing ticket, etc. Sponsored by American Warehousemen's Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R37-38; 1938. Commercial Forms (Invoice, Purchase Order, and Inquiry). This recommendation establishes standard dimensions, arrangement and content of printed matter appearing on form, for simplified invoice form, inquiry form, and purchase order form. Sponsored by the National Assn. of Purchasing Agents.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R50-26; 1926. Bank Checks, Notes, Drafts, and Similar Instruments. This recommendation establishes standard sizes for bank checks, bank drafts, notes, trade acceptances, counter checks, customers' checks, pocket checks, deposit slips, with uniform arrangement of subject-matter on checks. Sponsored by American Bankers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R93-39; 1939. Paper Shipping Tags. This recommendation establishes standard sizes of paper shipping tags made from manila stocks, kraft and dyed stocks, coated stocks, and white-lined stocks. Requirements are also given relative to weight in pounds, thickness in inches, and tare testing. Initiated by Tag Manufacturers Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R113-30; 1930. Restaurant Guest Checks. This recommendation establishes a standard schedule of guest checks made of cardboard and paper, and covering weights and thicknesses, widths, numbering, and printing and tinting. Initiated by the American Hotel Assn. of the United States and Canada, and National Restaurant Assn.

U. S. Gov., Federal Specification G-L-51; 1941. Labels; Poison. Covers one type, one grade, and two sizes—large and small. Gives requirements for material, workmanship, weight, gumming, color, letters, dimensions, and assembly; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-C-101a; 1939. Calendar Pads and Stands. Covers three types—(I) ordinary folding, (II) bound daily memorandum, and (III) executive large size, folding. Gives requirements for material, workmanship, stand,rubber shoes, pad; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-GG-C-101a; 1943, changes requirements for material, binding wires, sample, and specifies protective shoes in lieu of rubber shoes.

U. S. Gov., Federal Specification UU-T-81b; 1937. Amendment 3; 1944. Tags; Shipping, and Stock. Covers three types—(A) cloth, (B) paper, and (C) stock, circular, metal-bound. Gives requirements for material and workmanship, curl, surfaces, stock, average thickness, bursting strength, stringing, design, sizes, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Placards on Cars. Includes requirements for Explosives, Dangerous, Poison Gas, Dangerous-Empty, Fireworks, and Tear Gas placards, commodity name on loads, and application. Published by American Trucking Assn., Inc., Tariff Bureau, and Assn. American Railroads, Bureau of Explosives.

U. S. Gov., Navy Dept. Specification 35D1a; 1943. Drawings; Instrument, (Electrical) (for Navigational Purposes).

490-499 MISCELLANEOUS PAPER PRODUCTS

491. CONTAINERS

Liquid Tight Paper Container Assn. Paper Liquid Tight Containers, 1942. For 1/4 pint, 1/2 pint, pint, quart, 2 quart, and 1 gallon containers. Gives description of container and requirements for paper, thickness of paper, sizes or capacities of containers, and diameters.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-374; 1944. Preserver; Paper Negative (Photographic).

References.—Paper bags and paper linings for containers, *see* 957.2; fiber barrels, *see* 951.11; fiber drums, *see* 951.31; fiber firkins, *see* 951.45; fiber pails, *see* 951.63; fiber kits, *see* 951.66; fiber tubs, *see* 951.73; fiberboard baskets, *see* 952.14; paper and fiberboard boxes, *see* 953.2; cartons, *see*

954.1; paper and fiber cases, *see* 954.22; paper wrappings and coverings, *see* 959.6; paper cups, *see* 954.5.

492. ELECTRICAL INSULATING PAPER

493. PAPER PULLEYS

494. ENVELOPES AND FILE FOLDERS

American Hospital Assn., 43-31. Paper Negative Preservers (Photographic). Covers one grade in thin and medium weights. Based on U. S. Gov. Federal Specification G-P-641 for Paper Negative Preservers (Photographic).

American Hospital Assn., 49-16. Pressboard File Folders. Covers two types. Based on U. S. Gov. Federal Specifications ~~UU-F~~-581b for Pressboard File Folders, UU-P-31a for General Specifications for Paper, and CCC-T-191a for General Specifications, Test Methods, Textiles.

American Hospital Assn., 49-19. Vertical File (Calendered) Folders. Covers three grades. Based on U. S. Gov. Federal Specifications UU-F-571b for Vertical File (Calendered) Folders and UU-P-31a for General Specifications for Paper.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R187-42; 1942. Food Trays, or Dishes (Waxed Paper, Molded Wood Pulp, and Wood Types). Covers food trays, used as containers by grocery and delicatessen stores, meat markets, etc., and was approved at a general conference of members of the food-tray industry with a view to standardizing the weights for the various sizes of trays and to conserve materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Technologic Paper, T343; 1927. Study of the Window of Window Envelopes for the Purpose of Developing Standard Specifications. Includes suggested specifications on permissible opacity, gloss, and impregnating material and required bursting strength for 1-piece envelopes and on opacity, gloss, bursting strength, and adhesion of windows in 2-piece envelopes. U. S. postal regulations relating to window envelopes as regards location of window, allowance of other printed matter on envelope, return address, etc.

U. S. Gov., Federal Specification G-P-641; 1931. Amendment 1; 1937. Preservers; Negative, Kraft Paper (Photographic). Covers one grade in thin and medium weights. Gives requirements for quality, sizes, manufacture, stock, weight, folding endurance, bursting strength, style, finish, and sizes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-F-571c; 1944. Folders; File (Calendered), Vertical. Covers three types—(1) 100 percent chemical pulp, extra durable; (2) 100 percent chemical pulp; and (3) not less than 70 percent chemical pulp. Gives requirements for construction, tabs, writing quality, color, sizes, expansion, bid samples, stock, acidity, weight, average thickness, and average tearing strength; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-F-581c; 1944. Folders; File, Pressboard. Gives types and weights, colors, sizes, material, texture and finish, grain, corners, bid sample, and detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 53F4d; 1942. Folders; Wallet-Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-56; 1933. Preserver; Negative, Open-End Envelope for Filing X-Ray Negatives.

References.—Methods of testing paper, *see* 470.3; paper for envelopes, *see* 478.19.

495. FIBER CONDUIT

References.—Fiber conduit for electrical wiring, *see* 715.11.

496. TUBING

References.—Cotton yarn, *see* 302.10.

497. PAPER DISHES

497.1 PAPER CUPS

American Hospital Assn., 55-16. Paper Cups. Covers three types—(A) flat bottom (one-piece), (B) flat bottom (two-piece), and (C) conical or wedge-shape. Gives requirements for material, capacity, weight, thickness, bursting strength, leakage, and construction.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R132-36; 1936. Ice Cream Cups and Cup Caps. This recommendation establishes a schedule of sizes of ice cream cups and cup caps. Sponsored by International Assn. of Ice Cream Manufacturers.

U. S. Gov., Federal Specification UU-C-806b; 1944. Cups; Paper. Covers four types—(I) flat bottom, one piece (class A, paraffined and class B, nonparaffined); (II) flat bottom, two piece (class A, paraffined and class B, nonparaffined); (III) conical or wedge-shaped; and (IV) flat (not nested) rectangular or tapered. Gives requirements for material, workmanship, dispensers, rigidity, capacity, weight, thickness, bursting strength, leakage, and construction; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 53C12; 1945. Cups; Paper, Ice-Cream, With Cover-Disks, and Cover-Dispensing-Carton.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-58; 1934. Cup; Paper, Collapsible.

499. PAPER PRODUCTS NOT ELSEWHERE CLASSIFIED

American Chemical Society, Specifications for Analytical Reagents, 1941. Litmus Paper. Gives requirements for ash, rosin acids, etc., sensitiveness, and tests.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 19-33A; 1937. Paper; Target.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 78-4; 1932. Nest; Collar.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 78-6; 1932. Board; Shirt.

500-599 NONMETALLIC MINERALS

500-509 COAL, PETROLEUM, ASPHALT, AND MINERAL WAX

500. GENERAL ITEMS

American Petroleum Institute, Div. of Production. Code 27; 1942. Standard Procedure for Determining Permeability of Porous Media. Gives an approved laboratory procedure for permeability measurements, including uniform notation and definition of units; a bibliography is included.

American Petroleum Institute, Div. of Production. Code 29; 1942. Recommended Practice on Standard Field Procedure for Testing Drilling Fluids (Tentative). Covers determination of density, viscosity, sand content, hydrogen-ion content, and shear strength.

American Society of Mechanical Engineers. Power Test Codes, Auxiliary Section. Part 9—Heat of Combustion, 1943. Treats of calorimetric apparatus for solid, liquid, and gaseous fuels.

American Society of Mechanical Engineers. Power Test Codes, Auxiliary Section. Part 20—Smoke Density Determinations, 1936. Describes methods of measurements, instruments used, and smoke scale. Includes samples of standard smoke charts.

American Society for Testing Materials, C 108-44 T; 1944. Tentative Symbols for Heat Transmission. Gives special practices relating to heat flow terms including terms ending in "ivity," "ance," and "ion"; transmission; and conduction. Also heat flow symbols including area, density, specific heat, temperature, time, weight, flow rate, thermal conductivity, thermal resistivity, thermal resistance, thermal conductance, heat transfer, radiant flux, and thermal diffusivity.

American Society for Testing Materials, D 407-44; 1944. Definitions of the Terms Gross Calorific Value and Net Calorific Value of Fuels. Defines values for solid and liquid fuels of low volatility.

American Society for Testing Materials, E 4-36; 1936. American Assn. of State Highway Officials, T 67-42. Methods of Verification of Testing Machines. Includes definitions; methods of verifying machines that measure load by standard weights, by proving levers, by elastic calibration device, and by comparison method; test specimen, procedure, permissible variations, interval between verifications and reports.

American Society for Testing Materials, E 6-36; 1936. Definitions of Terms Relating to Methods of Testing. Covers stress, strain, elastic limit, field strength, tensile strength, compressive strength, and modulus of elasticity.

American Society for Testing Materials, E 12-27; 1927. American Assn. of State Highway Officials, M 132-42. Definitions of Terms Relating to Specific Gravity. Defines absolute specific gravity of solids and liquids, specific gravity, apparent specific gravity of solids, and bulk specific gravity of solids.

American Society for Testing Materials, E 13-42; 1942. Definition of the Term Screen (Sieve). Includes plate, or sheet, or woven cloth type.

American Society for Testing Materials, E 20-33 T; 1933. Tentative Method of Test for Particle Size Distribution of Subsieve Size Particulate Substances. Covers the range of sizes between the 74-micron (No. 200) sieve and 0.2-micron. The method is applicable to homogeneous materials. Definitions, rough separation of sample into size groups, preparation of mount, procedure, measurement of diameter, scale limits for measurement, and expression of results.

American Society for Testing Materials, E 24-42; 1942. Definitions of Terms Relating to Rheological Properties of Matter. Defines consistency, plasticity, elasticity, liquid, simple liquid, plastic and elastic solids, etc.

American Society for Testing Materials, E 28-42 T; 1942. Tentative Method of Test for Softening Point (Ball and Shouldered Ring Apparatus). Applicable to asphalts, tars, pitches, rosins, and most resins—both natural and synthetic. Apparatus, preparation of sample, procedure, softening point, precautions, and reproducibility of results.

Calcium Chloride Assn. Bulletin 37. Dustproofing and Freezeproofing Coal With Calcium Chloride. Covers general mechanical advices on calcium chloride treatment, calcium chloride treating solution, dry application, spray application, manual application, mechanical application, and additional facts.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Fire-Hazard Properties of Flammable Liquids, Gases, and Volatile Solids. Gives tables showing flash point, ignition temperature, explosive limits, specific gravity, vapor density, boiling point, Underwriters' Laboratories classification, and extinguishing agents.

References.—Other specifications for sieves, *see* 645.31.

501. COAL AND COKE

501.0 GENERAL ITEMS

American Boiler Manufacturers Assn. and Affiliated Industries. Grindability of Coals. Tabulation of data from various sources as to properties of coals tested in accordance with A.S.T.M. tentative method D-409-37T covering anthracite, bituminous, and subbituminous coals of U.S. and Canada.

American Society of Mechanical Engineers. Power Test Code. Solid Fuels, 1931. Recommends standard methods for a determination of those ascertainable chemical and physical properties which serve as indicators of the value of extensively used solid fuels when burned in boiler, industrial and domestic furnaces. With auxiliary sections covering general considerations, temperature measurement, heat of combustion, flue and exhaust gas analyses, and measurement of time.

American Society for Testing Materials, D 21-40; 1940. American Standards Assn., K46-1940. Method of

Sampling Coal for Analysis. For necessity of securing representative sample, time of sampling, size increments, collection of gross sample, quantity represented, crushing, minimum size, hand preparation, mechanical preparation, and for separate collection of moisture sample or for use of standard sample for moisture determination.

American Society for Testing Materials, D 121-30; 1930. Definitions of Terms Relating to Coal and Coke. Defines proximate analysis, ultimate analysis, moisture, ash, volatile matter, fixed carbon, beehive coke, byproduct coke, coke breeze, and dry coke.

American Society for Testing Materials, D 197-30; 1930. Method of Sampling and Fineness Test of Powdered Coal. Requirements for sieve analysis using standard micron square hole sieves, sampling in multiple and unit systems, preparation of sample, fineness test, and procedure for determination by hand or rapid routine machine sieving.

American Society for Testing Materials, D 271-44; 1944. American Standards Assn., K 18.1-1944. Methods of Laboratory Sampling and Analysis of Coal and Coke. Requirements for preparation, apparatus, coal appearing wet or dry, determination of moisture, ash, volatile matter, fixed carbon, sulfur, phosphorus in ash, and fusibility of ash; and for ultimate analysis for carbon and hydrogen, nitrogen, and oxygen; calorific value; methods of calculation, reproducibility of results, and deterioration of coal samples.

American Society for Testing Materials, D 388-38; 1938. American Standards Assn., M20.1-1938. Classification of Coals by Rank. Based on degree of metamorphism, or progressive alteration, in the natural series from lignite to anthracite, using fixed carbon and calorific value calculated to the mineral-matter-free basis. Classification by rank, weathering index, agglomerating index, symbols for expressing classification, sampling, methods of analysis and tests using A.S.T.M. method D-271, and formulas for calculation to mineral-matter-free basis. Includes appendix on published analyses.

American Society for Testing Materials, D 389-37; 1937. American Standards Assn., M20.2-1937. Classification of Coals by Grade. Covers classification by quality, as determined by size designation, calorific value, ash, ash-softening temperature, and sulfur. Includes symbols for grading coal, size designation using A.S.T.M. method D-431, sampling method D-21, and analysis method D-271.

American Society for Testing Materials, D 408-37T; 1937. Tentative Method of Test for Grindability of Coal by the Ball-Mill Method. Energy necessary to pulverize coal in a ball mill and number of revolutions required to grind so that 80 percent of the sample passes a 74-micron sieve. Describes special small ball mill for test, preparation of sample, method of procedure, and rapid control modification, with table of conversion of values to the Hardgrove grindability index.

American Society for Testing Materials, D 409-37T; 1937. Tentative Method of Test for Grindability of Coal by the Hardgrove Machine Method. Determining ease of pulverizing in comparison with a coal chosen as 100 grindability, based on Rittinger's Law. Gives design of Hardgrove machine, requirements for standard sieves, preparation of sample, test procedure, and computation of the Hardgrove grindability index.

American Society for Testing Materials, D 410-38; 1938. Method of Test for Screen Analysis of Coal. For all coal except anthracite, powdered coal used in boiler plants, and crushed coal as charged into coke ovens. Requirements for standard screens and wire cloth sieves with square openings, time of sampling; collection of, weight of, and reduction of gross sample; drying sample, screen analysis, and report.

American Society for Testing Materials, D431-44; 1944. American Standards Assn., M20.3-1944. Method of Designating the Size of Coal From Its Screen Analysis. Covers natural continuous ranges of sizes as produced by mining, handling, crushing, screening, etc., but does not cover standardization of screens used in the commercial preparation of coal. Sampling using A.S.T.M. method D410, 8-in. to 3/8-in. round-hole screens, No.4 to No.200 wire cloth sieves with square openings, size designations, and condensed size designation.

American Society for Testing Materials, D 440-37T; 1937. Tentative Method of Drop Shatter Test for Coal. For determining the relative size stability and friability of lump coal, indicating ability of coal to withstand breakage in handling at the mine and during transit to the consumer. Method for testing 2 to 3-in. standard single size, and a supplementary test for other single sizes, and for mixed sizes of the same coal. Construction of shatter test machine, screens, routine of procedure, and report of screen analysis before and after testing.

American Society for Testing Materials, D 441-37T; 1937. Tentative Method of Tumbler Test for Coal. For relative friability of a particular size of lump coal, as a measure of liability to breakage in handling at the mine or subsequently. Describes porcelain jar tumbler and iron jar tumbler, sample preparation, test procedure, and sieve analysis.

American Society for Testing Materials, D 492-43T; 1943. Tentative Methods of Sampling Coals Classed According to Ash Content. Covers principles of sampling and precautions, commercial sampling procedure, special purpose sampling procedure, increments, reduction of gross samples, sampling for determination of total moisture, procedure for standard and for special moisture sample, handling of moisture samples in laboratory, and calculation.

American Society for Testing Materials, D 547-41; 1941. Method of Test for Index of Dustiness of Coal and Coke. For determination of a relative index of dust produced when handling. Apparatus, sample, method and preparation of sample, drying and testing procedures, and expression of index values.

American Society for Testing Materials, D 720-43T; 1943. Tentative Method of Test for Free-Swelling Index of Coal. A small-scale laboratory test and the results may be used as an indication of the coking characteristic of the coal when burned as a fuel. Gives requirements for apparatus, preparation of sample, calibration of burner, procedure, and report.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 12.80; 1942. Safe Storage of Bituminous Coal. Gives suggestions on the storage of bituminous coal including conditions which influence spontaneous heating, buying coal by specifications, method of storage, roll-packing coal piles, checking temperatures, and handling coal fires.

National Assn. of Purchasing Agents, Inc. Factors Recommended for Consideration in the Selection of Coal. Includes charts as a guide both to the consumer who wishes to know what coal characteristics should be considered in order to make the proper selection of coal for his particular needs, and to the coal producer who wishes to reach those markets for which his products are best suited. It is not claimed that the ratings on the charts are accurate in every detail, but they do represent in each instance the average present opinion of a number of fuel technologists. Space has not permitted the inclusion of every coal-selection factor. For example, ultimate analysis has not been included although it has had successful use for special coal-selection purposes and is also used in heat-balance calculations. Nor has it been possible to show the influence of the factors upon each other.

Technical Assn. of the Pulp and Paper Industry. Sampling and Analysis of Coal, Standard T 605 m-44; 1944. Covers sampling, preparation of laboratory sample, method of laboratory sampling, moisture, ash, volatile matter, fixed carbon, calorimetric determination (B.T.U.), and tolerances. This is essentially the same as A.S.T.M. standards D 21-40 and D 271-43.

501.1 ANTHRACITE COAL

American Society for Testing Materials, D 310-34; 1934. Method of Test for Size of Anthracite. Covers determination of percentage of undersize or oversize in any commercial size, dimensions and design of screens, screen openings, collection and preparation of sample using A.S.T.M. method D 21, and procedure.

Anthracite Institute. Standard Anthracite Specifications, 1944. Lists standard mesh through and over, tolerances, maximum percentage of slate, bone, and ash for broken; egg, stove, nut, pea, buck, rice, barley, No.4, and No.5 sizes of anthracite (hard coal).

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Coal; Anthracite. Covers definition, constants, chemical composition, derivation, grades, marketing, uses, and substitutes.

References.—Definitions, methods of sampling and and of testing, *see* 500., 501.0.

501.2 BITUMINOUS COAL

American Society for Testing Materials, D 166-24; 1924. Gas and Coking Coals. Gives limits within which gas and coking coals usually fall; method of sampling, analysis, mine moisture limits, fusion point of ash, volatile matter, ash, sulfur, quality of coke, and for coke, phosphorus, and shrinkage.

American Society for Testing Materials, D 291-29; 1929. American Standards Assn., K20.1-1936. Method of Test for Cubic Foot Weight of Crushed Bituminous Coal. For coarsely crushed coal, less than 1 1/2 in. in size, such as charged into coke ovens, but not applicable to powdered coal as used in boiler plants. Requirements for measuring box, sampling using A.S.T.M. method D-21, and test procedure.

American Society for Testing Materials, D 311-30; 1930. Method of Test for Sieve Analysis of Crushed Bituminous Coal. For coarsely crushed bituminous coal, less than 1 1/2 in. in size, such as charged into coke ovens; not applicable to testing of powdered coal as used in boiler plants. Requirements as to ratio of sieve openings for successive sieves, sampling according to A.S.T.M. method D 21, and for test procedure.

American Society for Testing Materials, D493-39; 1939. American Standards Assn., M20.4-1939. Definitions for Commercial Varieties of Bituminous and Sub-Bituminous Coals. Defines common banded coal, splint coal, cannel coal, and boghead coal.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Coal; Bituminous. Covers definition, derivation, uses, and grades.

References.—Definitions, methods of sampling and of testing, *see* 500., 501.0.

501.3 SEMIBITUMINOUS COAL

501.4 COAL-TAR PRODUCTS

References.—Coal-tar chemical products, *see* 800-809.

501.5 COKE

American Society for Testing Materials, D 141-23; 1923. American Standards Assn., K20.4-1936. Method of Drop Shatter Test for Coke. For resistance to breakage in handling and in transit; requirements as to dimensions and design of shatter test machine, sampling of beehive and byproduct coke at source and at delivery, and test procedure.

American Society for Testing Materials, D 167-24; 1924. American Standards Assn., K20.5-1936. Method of Test for Volume of Cell Space of Lump Coke. Formula for volume of cell space, description of apparatus required, unit for sampling, sampling at source and at delivery, and outline of procedure for apparent specific gravity and true specific gravity.

American Society for Testing Materials, D 292-29; 1929. American Standards Assn., K20.2-1936. Method of Test for Cubic Foot Weight of Coke. For coke passing 5-in. square-mesh sieve; requirements for measuring box, sampling, and test procedure.

American Society for Testing Materials, D 293-29; 1929. Method of Test for Sieve Analysis of Coke. Covers requirements for range of sizes of standard square-hole sieves, method of sampling, procedure for test, and average of analyses.

American Society for Testing Materials, D 294-29; 1929. American Standards Assn., K20.3-1936. Method of Tumbler Test for Coke. For measure of resistance to degradation by abrasion; description of tumbler machine, sieve sizes, preparation of sample, and requirements for test.

American Society for Testing Materials, D 346-35; 1935. Method of Sampling Coke for Analysis. Covers procedures for collection and preparation of samples for laboratory analysis; requirements for sample for all determinations except total moisture, place of sampling, size of increments, minimum weight of gross sample, crushing sample, reduction of sample, and sample for determining total moisture.

U. S. Gov., Federal Specification Q-C-571a; 1935. Coke; Foundry. Covers three grades—(A) cupola; (B) general foundry, large, and (C) general foundry, small. Gives requirements for chemical analysis, size, foundry, and shatter test; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 7C2b; 1942. Coke; Foundry and Shop.

References.—Definitions, methods of sampling and of testing, *see* 500., 501.0.

501.6 CHARCOAL

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U.S., 1941. Animal Charcoal and Vegetable Charcoal. Natural order, synonyms, description, habitat, history, parts used, and preparation for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Purified Animal Charcoal. Gives description, solubility, loss on drying, reaction, impurities soluble in hydrochloric acid, absorptive power, storage, and average dose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Charcoal; Wood. Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Activated Charcoal. Description, volatile substances, ash, reaction, chloride, sulfate, sulfide, cyanogen compounds, acid-soluble substances, heavy metals, uncarbonized constituents, absorptive power, and storage.

U. S. Gov., Federal Specification LLL-C-251; 1933. Charcoal. Covers one grade in lump and briquet form by charring hard or soft wood. Gives requirements for contamination, size, ash, moisture, and volatile matter; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2692; 1939. Charcoal; Block.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-42B; 1938. Charcoal; for Black Powder.

501.9 MISCELLANEOUS PRODUCTS

U. S. Gov., Navy Dept. Specification 51C14; 1925. Compounds; Carburizing.

502. PETROLEUM

502.0 GENERAL ITEMS

American Leather Chemists Assn. Methods of Sampling and Analysis. Cloud and Pour Points of Oil, 1938. The cloud point of a petroleum oil is the temperature at which paraffin wax or other solid substances begin to crystallize out or separate from solution when the oil is chilled under definite prescribed conditions. The pour point of a petroleum oil is the lowest temperature at which the oil will pour or flow when it is chilled without disturbance under definite prescribed conditions. Gives requirements for apparatus, procedure, and special procedure for black oils and cylinder stocks.

American Petroleum Institute, Div. of Production. Code. 25; 1940, and Supplement 3; 1943. Code for Measuring, Sampling, and Testing Crude Oil. Covers tank measurement and calibration, gaging, sampling, and testing crude oil—general; tank measurement and calibration, gaging, sampling, and testing crude oil—marine; and accounting forms and methods.

American Society for Testing Materials, D 88-44; 1944. American Petroleum Institute Standard, 518-44. American Assn. of State Highway Officials, T72-44. American Standards Assn., Z11.2-1944. Method of Test for Viscosity by Means of the Saybolt Viscosimeter. Covers use of Saybolt Universal viscosimeter for general use, and of Saybolt Furol viscosimeter for fuel and road oils, dimensions and design of apparatus, temperatures of tests, and outline of procedure.

American Society for Testing Materials, D 287-39; 1939. American Petroleum Institute Standard, 526-39. American Standards Assn., Z11.31-1939. Method of Test for Gravity of Petroleum and Petroleum Products by Means of the Hydrometer. Covers the determination of the specific gravity and the A.P.I. gravity of crude petroleum and petroleum products normally handled as liquids. The determination of the gravity of mixtures of petroleum products with other substances is treated as a special case, owing to the fact that the coefficients of expansion of such mixtures may not be the same as those of petroleum or its products. The determination of the specific gravity of road oils, road tars, asphalt cements, and soft tar pitches is covered by the Standard Method of Test D 70 of the American Society for Testing Materials, and the testing of these products is, therefore, specifically excluded from the scope of this method.

American Society for Testing Materials, D 288-39; 1939. American Petroleum Institute Standard, 535-39. American Standards Assn., Z11.28-1939. Definitions of Terms Relating to Petroleum. Defines benzine, crude petroleum, crude shale oil, end point, engine distillate, fuel oil, gasoline, kerosene, oil-shale, petroleum grease, petroleum naphtha, petroleum spirits, pitch, tar, topped crude petroleum, tops, and weathered crude petroleum.

American Society for Testing Materials, D 446-39; 1939. American Petroleum Institute Standard, 534-39. American Standards Assn., Z11.46-1941. Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity. Includes table of values and equation for converting kinematic viscosity in centistokes at any temperature to Saybolt viscosity in seconds at the same temperature.

American Society for Testing Materials, D 482-43T; 1943. Tentative Method of Test for Ash Content of Petroleum Oils. Intended for use in the determination of the ash content of fuel oils and other petroleum oils. Gives requirements for procedure, reporting results, and reproducibility of results.

American Society for Testing Materials, D664-44T; 1944. Tentative Method of Test for Acid and Base Numbers of Petroleum Products by Electrometric Titration. Designed to indicate in petroleum products and lubricants and compounded products the presence of organic constituents having acid or basic characteristics. Gives definitions, outline of method, apparatus, preparation of electrode system, procedure, calculation, and report.

American Wood-Preservers' Assn., 40c; 1940. Standard Abridged Volume Correction Tables for Petroleum Oils. Gives abridged tables containing factors for reducing oil volumes on the basis of 60° F. (Table 1), and 100° F. (Table 2), for observed temperatures from 30° F. to 220° F. Based on the National Bureau of Standards Circular C410. Only group 0 and group 1 oils considered. Group 0 with gravity ranges up to 14.9 degrees A.P.I. and group 1 with gravity range 15.0 to 34.9 degrees A.P.I.

National Assn. of Dyers and Cleaners of the U.S. and Canada. The Dry Cleaning Department, 1940. Includes methods of practical tests of petroleum solvents for water alkali, sulfuric acid, soaps, and fatty acid or determination of acid number.

National Assn. of Dyers and Cleaners of the U.S. and Canada. The Dry Cleaning Department, 1940. Includes petroleum solvents and soaps used in them for dry cleaning purposes, and methods for clarifying solvents.

502.1 CRUDE PETROLEUM

American Society for Testing Materials, D270-33; 1933. American Petroleum Institute Standard, 528-33. American Standards Assn., Z11.33-1935. Methods of Sampling Petroleum and Petroleum Products. Includes all petroleum products except gases. Requirements for experienced personnel, and description of apparatus; for bottle or beaker sampling of tank cars and trucks; and shore, ship, or barge tanks; continuous sampling of pipe lines, dipper sampling of streams; thief sampling of cans, drums, and tank cars; borings sampling of wax, soft solids in cases, cakes, bags, or barrels; and grab sampling of lumpy material in bins, bunkers, sacks, and barrels.

American Society for Testing Materials, D285-41; 1941. American Petroleum Institute Standard, 525-41. American Standards Assn., Z11.32-1941. Method of Test for Distillation of Crude Petroleum. For determining the percentages and distillation range of the naphtha in any refinable crude but does not define quality of naphtha. Description of Hempel distillation flask, fractioning column, condenser, heater, and 300-ml. pipette; preparation of apparatus and distillation procedure for naphtha distillation A.S.T.M. method D 86 and correction for barometric pressure.

References.—Definitions and methods of testing, *see* 502.0, 502.2; road oils, *see* 505.2; fuel and gas oils, *see* 503.4.

502.2 PETROLEUM PRODUCTS

American Assn. of State Highway Officials, T79-42. Standard Method of Test for Flash Point With Tagliabue Open Cup. For use with material having a flash point of less than 175° F. Gives details for this method of test.

American Society for Testing Materials, D 92-33; 1933. American Petroleum Institute Standard, 511-33. American Assn. of State Highway Officials, T48-42. American Standards Assn., Z11.6-1933. Method of Test for Flash and Fire Points by Means of Open Cup. For all petroleum products except fuel oils and those having an open cup flash below 175°F. Includes description of Cleveland open cup, heating plate, and procedure for flash and fire points.

American Society for Testing Materials, D 95-40; 1940. American Petroleum Institute Standard, 519-40. American Assn. of State Highway Officials, T 55-42. American Standards Assn., Z 11.9-1940. Method of Test for Water in Petroleum Products and Other Bituminous Materials. Especially applicable to petroleum, fuel oil, road oil, coal tar, water-gas tar, coke oven tar, etc. Determination of water by distilling sample with volatile solvent, dimensions and design of still, distillation requirements of solvent, test procedure.

American Society for Testing Materials, D 96-40; 1940. American Petroleum Institute Standard, 520-40. American Standards Assn., Z11.8-1940. Method of Test for Water and Sediment in Petroleum Products by Means of Centrifuge. May be used for crude mineral oils and fuel oils; a more accurate method is given in A.S.T.M. method D 95. Structural requirements and speed of centrifuge, capacity and graduation for centrifuge tubes, and test procedure.

American Society for Testing Materials, D 97-39; 1939. American Petroleum Institute Standard, 506-39. American Standards Assn., Z11.5-1939. Method of Test for Cloud and Pour Points. Cloud point test limited to transparent oil, for determining temperature at which paraffin wax or other solids begin to separate when oil is chilled, and pour point test for lowest temperature at which oil will flow under prescribed conditions. Description of apparatus, and methods of procedure, with special procedures for black oils, cylinder stocks, and non-distillate fuel oils. A.S.T.M. Emergency Alternate Provision, EA-D 97, 1944, affected section 5, Procedure for Pour Point.

American Society for Testing Materials, D 286-30; 1930. American Petroleum Institute Standard, 522-30. American Standards Assn., Z 11.23-1932. Method of Test for Autogenous Ignition Temperatures of Petroleum Products. For liquid and semiliquid petroleum products, determination of minimum ignition temperature of fuel admitted to flask immersed in a solder bath, description of apparatus, and test procedure.

American Society for Testing Materials, D323-43; 1943. American Petroleum Institute Standard, 539-43. American Standards Assn., Z11.44-1943. Method of Test for Vapor Pressure of Petroleum Products (Reid Method). Intended for the determination of the vapor pressure of volatile, nonviscous petroleum products. Gives apparatus, sampling, procedure, calculation, and reproducibility of results.

American Society for Testing Materials, D 341-43; 1943. American Petroleum Institute Standard, 533-43. American Standards Assn., Z 11.39-1943. Viscosity-Temperature Charts for Liquid Petroleum Products. Means for ascertaining the viscosity of a petroleum oil at any temperature within a limited range, provided viscosities at two temperatures are known. Includes three charts for Saybolt and kinematic viscosity, and covers precaution, description, procedure, and extrapolation.

American Society for Testing Materials, D445-42T; 1942. Tentative Method of Test for Kinematic Viscosity, Intended for determining the kinematic viscosity of any petroleum product or lubricant which is a true viscous liquid at the temperature of the test. Gives apparatus, procedure, calibration, and reporting results.

American Society for Testing Materials, D 447-41; 1941. American Petroleum Institute Standard, 538-41.

American Standards Assn., Z11.43-1941. Method of Test for Distillation of Plant Spray Oils. Apparatus and procedure.

American Society for Testing Materials, D483-40; 1940. American Petroleum Institute Standard, 536-40. American Standards Assn., Z11.41-1940. Method of Test for Unsulfonated Residue of Plant Spray Oils. Requirements for special solutions, apparatus, and outline of procedure for determinations.

American Society for Testing Materials, D567-41; 1941. American Petroleum Institute Standard, 540-41. American Standards Assn., Z11.45-1941. Method for Calculating Viscosity Index. Provides a means for calculating the viscosity index of a petroleum product or lubricant from its viscosity at 100° and 210° F. Gives definition, formulas and tables, calculation, reproducibility, and tables showing values.

American Society for Testing Materials, D611-44T; 1944. Tentative Method of Test for Aniline Point and Mixed Aniline Point of Petroleum Products. Intended for determining the aniline point of petroleum products not darker than No. 8, A.S.T.M. color, provided the aniline point lies between the initial boiling point and the solidification point of the aniline-sample mixture. Gives definitions, apparatus, reagents, preparation of sample, procedure, report, and reproducibility of results.

American Society for Testing Materials, D663-44T; 1944. Tentative Method of Test for Acid and Base Numbers of Petroleum Products by Color-Indicator Titration. Designed to indicate in petroleum products and lubricants and compounded products the presence of organic constituents having acid or basic characteristics. Gives definitions, outline of method, apparatus, reagents, procedure, and calculation and report.

American Society for Testing Materials, E 12-27; 1927. American Assn. of State Highway Officials, M 132-42. Definitions of Terms Relating to Specific Gravity. Defines absolute specific gravity of solids and liquids, specific gravity, apparent specific gravity of solids, and bulk specific gravity of solids.

American Wood-Preservers' Assn., 49c; 1943. Standard Specification for Petroleum for Blending With Creosote. Gives requirements for specific gravity, permissible water and sediment, flash point, and viscosity tolerance, using tests in accordance with A.S.T.M. methods.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Flash Point Test-Tag Closed Tester. For determining the flash point of mobile liquids flashing below 175° F. and lacquer solvents or diluents of low flash points. Covers apparatus, procedure, repeat tests, average value of flash point, and correction for barometric pressure.

Society of Automotive Engineers. Aeronautical Material Specification 3070A; 1943. Oil; Corrosion-Preventive (Carburetor Slushing). Material shall be refined petroleum oil without the admixture of other additive compounds not naturally occurring in petroleum and suitable for protecting the interior of carburetors from corrosion during shipment and storage. Covers physical requirements, tests, reports, identification, approval, and rejection. Similar to Army-Navy Aeronautical Specification AN-VV-O-446, Grade 1065.

Toilet Goods Assn., Inc. Mineral Oil (Non-Paraffin Base), 1940. Gives requirements for color, odor, taste, solubility, viscosity, specific gravity, saponification, free acids, free alkalis, sulfur compounds, carbonizable substances and unsaturated hydrocarbons. ash, arsenic, and lead.

Toilet Goods Assn., Inc. Mineral Oil (Paraffin Base), 1940. Gives requirements for color, odor, taste, solubility, viscosity, specific gravity, saponification value, free acids, free alkalis, sulfur compounds, carbonizable substances and unsaturated hydrocarbons, ash, arsenic, and lead.

Toilet Goods Assn., Inc. Specification 1A; 1941. Mineral Oil. Gives requirements for color, cloud point, odor, taste, solubility, viscosity, specific gravity, free acids and alkalis, saponification value, sulfur and sulfides, carbonizable substances and unsaturated hydrocarbons, ash, arsenic, and lead.

U. S. Gov., Army Air Forces. Specification 3580-D (1); 1944. Fluid; Hydraulic (Petroleum Base).

U. S. Gov., Navy Dept. Specification 52C16; 1943. Compound; Metal-Conditioning.

U. S. Gov., Navy Dept. Specification 52P14a; 1941. Petroleum-Residuum; Blown.

References.—Definitions and methods of testing, *see* 502.0; fuel and illuminating oils, *see* 503; lubricating oils and greases, *see* 504; oil asphalt, *see* 505.14; miscellaneous oils, *see* 509.

503. FUEL AND ILLUMINATING OILS

503.0 GENERAL ITEMS

American Oil Chemists' Society. Standard Methods for the Sampling and Analysis of Commercial Fats and Oils, 1943. Applies to fats and fatty oils used in the soap, candle, and tanning industries, to edible fats and oils, to fats and fatty oils intended for lubricating and burning purposes, and to the raw oils used in the varnish and paint industry, but not intended for waxes. Covers sampling; analysis for moisture and volatile matter, insoluble impurities, soluble mineral matter, fatty acids combined as mineral soap, free fatty acids, titer, unsaponifiable matter, iodine number, saponification number, melting point, softening point, slipping point, flow test, cloud test, bleach test, Halphen test (for cottonseed oil), modified Vallavecchia test, Reichert-Meissl and Polenske numbers, Kirschner value, index of refraction, specific gravity, acetyl and hydroxyl value; smoke, flash, and fire points, F.A.C. standard colors, modified Wiley melting point method, thiocyanogen method, and Twitchell method.

American Society of Mechanical Engineers. Power Test Code. Liquid Fuels, 1930. Specifies standard methods for the determination of those ascertainable chemical and physical properties which serve as indicators of the value of those liquid fuels which are extensively used in generation of heat and power.

American Society for Testing Materials, D 6-39 T; 1939. American Assn. of State Highway Officials, T 47-42. Tentative Method of Test for Loss on Heating of Oil and Asphaltic Compounds. Covers test of water-free material for loss of volatile matter when heated under specified temperature in specially described electric oven for definite period.

American Society for Testing Materials, D 56-36; 1936. American Petroleum Institute Standard, 509-36. American Standards Assn., Z11.24-1936. Method of Test for Flash Point by Means of the Tag Closed Tester. For all mobile liquids flashing below 175° F., except for fuel oil which is preferably tested with the Pensky-Martens closed tester. Dimensions of tag closed tester, requirements for thermometers, procedure for average value of flash point, and variation for lacquer solvents or diluents of low flash point.

American Society for Testing Materials, D 86-40, 1940. American Petroleum Institute Standard, 507-40. American Assn. of State Highway Officials, T 115-42. American Standards Assn., Z11.10-1940. Methods of Test for Distillation of Gasoline, Naphtha, Kerosene, and Similar Petroleum Products. Dimensions and design of flask, condenser, support, and thermometers; test procedure, corrections for barometric pressure.

American Society for Testing Materials, D 88-44; 1944. American Petroleum Institute Standard, 518-44. American Assn. of State Highway Officials, T 72-44. American Standards Assn., Z11.2-1944. Method of Test for Viscosity by Means of the Saybolt Viscosimeter. Covers use of Saybolt Universal viscosimeter for general use, and of Saybolt Furol viscosimeter for fuel and road oils, dimensions and design of apparatus, temperatures of tests, and outline of procedure.

American Society for Testing Materials, D 90-41 T; 1941. Tentative Method of Test for Sulfur in Petroleum Oils by Lamp Method. For determination of sulfur in gasoline, kerosene, petroleum naphtha, and other petroleum oils that can be burned completely in a wick lamp. This method may be applied to mixtures of petroleum oils with other volatile organic liquids, provided the only acidic compounds produced are those derived from sulfur. Apparatus, reagents, procedure, calculation, check determination, and reproducibility of results.

American Society for Testing Materials, D93-42; 1942. American Petroleum Institute Standard, 510-42. American Assn. of State Highway Officials, T73-42. American Standards Assn., Z11.7-1942. Method of Test for Flash Point by Means of the Pensky-Martens Closed Tester. For fuel oils, dimensions and design of tester cup, stirring device, air bath, thermometer, and test procedure.

American Society for Testing Materials, D 95-40; 1940. American Petroleum Institute Standard, 519-40. American Assn. of State Highway Officials, T 55-42. American Standards Assn., Z11.9-1940. Method of Test for Water in Petroleum Products and Other Bituminous Materials. Especially applicable to petroleum, fuel oil, road oil, coal tar, water-gas tar, coke oven tar, etc. Determination of water by distilling sample with volatile solvent, dimensions and design of still, distillation requirements for solvent, test procedure.

American Society for Testing Materials, D 96-40; 1940. American Petroleum Institute Standard, 520-40. American Standards Assn., Z11.8-1940. Method of Test for Water and Sediment in Petroleum Products by Means of Centrifuge. May be used for crude mineral oils and fuel oils; a more accurate method is given in A.S.T.M. method D 95. Structural requirements and speed of centrifuge, capacity and graduation of centrifuge tube, and test procedure.

American Society for Testing Materials, D129-44; 1944. American Petroleum Institute Standard, 516-44. American Standards Assn., Z11.13-1944. Method of Test for Sulfur in Petroleum Oils by Bomb Method. For oils which cannot be burned completely in a wick lamp. Gives apparatus, special solutions required, procedure, calculation, and reproducibility. Emergency Alternate Provision EA-D129 affected section 1, Scope; section 3, Special Solutions; section 4, Procedure, and section 6, Reproducibility.

American Society for Testing Materials, D 156-38; 1938. American Petroleum Institute Standard, 530-38. American Standards Assn. Z11.35-1938. Method of Test for Color of Refined Petroleum Oil by Means of Saybolt Chromometer. For color of naphthas, kerosene, etc. Description of Saybolt chromometer, and procedure for comparing color of oil with standard color disks.

American Society for Testing Materials, D 158-41; 1941. American Petroleum Institute Standard, 512-41. American Standards Assn., Z11.26-1941. Method of Test for Distillation of Gas Oil and Similar Distillate Fuel Oils. For distillates having viscosities intermediate between kerosene and lubricating oil. Description of Saybolt distilling flask, condenser, heater, and graduates, preparation of apparatus, and outline of procedure.

American Society for Testing Materials, D 189-41; 1941. American Petroleum Institute Standard, 505-41. American Standards Assn., Z11.25-1941. Method of Test for Carbon Residue of Petroleum Products (Conradson Carbon Residue). For the relative carbon-forming propensity of lubricants for internal-combustion engines, domestic oil fuels, and oils used in the manufacture of gas. Describes evaporating apparatus, insulator and burner, with standard procedure, and special procedures for high and for low carbon residues.

American Society for Testing Materials, D 206-36; 1936. American Petroleum Institute, 500-36. American Standards Assn., Z11.1-1936. Prepared by the National Bureau of Standards. Abridged Volume Correction Table for Petroleum Oils. Table for reducing oil volumes to the basis of 60° F., when extreme accuracy is not required. Includes eight groups covering coefficients of expansion, gravity (degrees API), and gravity ranges.

American Society for Testing Materials, D 240-39; 1939. American Petroleum Institute Standard, 517-39. American Standards Assn., Z11.14-1939. Method of Test for Thermal Value of Fuel Oil. Covers suitable makes of calorimeters, requirements for capacity and jacketing of calorimeter bomb, determination of water equivalent of bomb by the combustion of standard samples obtained from the National Bureau of Standards, radiation equivalent, and procedure for test.

American Society for Testing Materials, D 270-33; 1933. American Petroleum Institute Standard, 528-33. American Standards Assn., Z11.33-1935. Methods of

Sampling Petroleum and Petroleum Products. Includes all petroleum products except gases. Requirements for experienced personnel and description of apparatus; for bottle or beaker sampling of tank cars and trucks; and shore, ship, or barge tanks; continuous sampling of pipe lines, dipper sampling of streams; thief sampling of cans, drums, and tank cars; borings sampling of wax, soft solids in cases, cakes, bags, or barrels; and grab sampling of lumpy material in bins, bunkers, sacks, and barrels.

American Society for Testing Materials, D 286-30; 1930. American Petroleum Institute Standard, 522-30. American Standards Assn., Z11.23-1932. Method of Test for Autogenous Ignition Temperatures of Petroleum Products. For liquid and semiliquid petroleum products, determination of minimum ignition temperature of fuel admitted to flask immersed in a solder bath, description of apparatus, and test procedure.

American Society for Testing Materials, D287-39; 1939. American Petroleum Institute Standard, 526-39. American Standards Assn., Z11.31-1939. Method of Test for gravity of Petroleum and Petroleum Products by Means of the Hydrometer. Covers the determination of the specific gravity and the A.P.I. gravity of crude petroleum and petroleum products normally handled as liquids. The determination of the gravity of mixtures of petroleum products with other substances is treated as a special case, owing to the fact that the coefficient of expansion of such mixtures may not be the same as those of petroleum or its products. The determination of the specific gravity of road oils, road tars, asphalt cements, and soft tar pitches is covered by the Standard method of test D 70 of the American Society for Testing Materials, and the testing of these products is, therefore, specifically excluded from the scope of this method.

American Society for Testing Materials, D288-39; 1939. American Petroleum Institute Standard, 535-39. American Standards Assn., Z11.28-1939. Definitions of Terms Relating to Petroleum. Defines benzine, crude petroleum, crude shale oil, and point, engine distillate, fuel oil, gasoline, kerosene, oil-shale, petroleum grease, petroleum naphtha, petroleum spirits, pitch, tar, topped crude petroleum, tops, and weathered crude petroleum.

American Society for Testing Materials, D357-44; 1944. American Petroleum Institute Standard, 532-44. American Standards Assn., Z11.37-1944. Method of Test for Knock Characteristics of Motor Fuels. For determining knock characteristics, in terms of an arbitrary scale of octane numbers, of fuels for use in spark-ignition engines other than engines for aircraft. Gives requirements for A.S.T.M. motor octane number, apparatus, reference fuels, standard engine and operating conditions, outline of test, starting and stopping the engine, obtaining standard knock intensity, adjusting bouncing pin, checking test conditions, adjusting compression ratio and carburetor, bracketing the test fuel, test fuel rating, reproducibility of results, and appendices.

American Society for Testing Materials, D446-39; 1939. American Petroleum Institute Standard, 534-39. American Standards Assn., Z11.46-1941. Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity. Includes table of values and equation for converting kinematic viscosity in centistokes at any temperature to Saybolt viscosity in seconds at the same temperature.

American Society for Testing Materials, D524-42; 1942. American Petroleum Institute Standard, 541-42. American Standards Assn., Z11.47-1942. Method of Test for Carbon Residue of Petroleum Products (Ramsbottom Carbon Residue). Test for relative carbon-forming propensities of oils but in general not numerically equal to the Conradson carbon residue values. Design and dimensions of coking bulb, other apparatus requirements, and outline of test procedures. Emergency Alternate Provisions, EA-D524; 1942, affected section 2, Apparatus; and section 3, Procedure.

American Society for Testing Materials, D567-41; 1941. American Petroleum Institute Standard, 540-41. American Standards Assn., Z11.45-1941. Method for Calculating Viscosity Index. Provides a means for calculating the viscosity index of a petroleum product or lubricant from its viscosity at 100° and 210° F. Gives definition, formulas and tables, calculation, reproducibility, and tables showing values.

American Society for Testing Materials, D 613; 43T-1943. Tentative Method of Test for Ignition Quality of Diesel Fuels. Intended for determining the ignition quality of Diesel fuels in terms of an arbitrary scale of A.S.T.M. cetane numbers. Gives requirements for A.S.T.M. cetane number, apparatus, reference fuels, standard engine and operating conditions, starting and stopping the engine, injection indicator contact setting, basic combustion indicator contact setting, final combustion indicator contact setting, bracketing the test fuel, calculation and report, and appendices.

American Society for Testing Materials, D614-44T; 1944. Tentative Method of Test for Knock Characteristics of Aviation Fuels. Intended for determining the knock characteristics of fuels for use in aircraft engines of the spark-ignition type. Gives requirements for A.S.T.M. aviation octane number, apparatus, reference fuels, standard engine and operating conditions, starting and stopping the engine, adjusting compression ratio and carburetor, bracketing the test fuel, test fuel rating, procedure, A.S.T.M. aviation knock value, reproducibility, and appendices.

American Society for Testing Materials, ES-32; 1943. Emergency Method of Test for Color of U.S. Army Motor Fuel (All-Purpose) by Means of an A.S.T.M. Color Standard. Covers the procedure for rapidly determining whether the color of a motor fuel conforms to the requirements by visual comparison with color standard. Gives requirements for A.S.T.M. color standard, procedure, and precautions.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 13.20; 1940. Flammable Liquid Safeguards; General Principles for Safe Industrial Installations. Discusses the seven safeguards for flammable liquids which are—isolate the hazard, confine the liquid, ventilate to prevent explosive mixtures, install explosive vents where needed, eliminate ignition sources, educate employees on hazards and safeguards, and provide adequate fire protection.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Flammable Liquids Ordinance. Suggested ordinance Regulating the Use, Handling, Storage, and Sale of Flammable Liquids and the Products Thereof. Includes new and existing installations for three classes of liquids with flash point below 200° F. closed cup tester, definitions, general requirements, capacity and location of storage tanks, piping and appurtenances, petroleum products, paints, varnishes, etc. Appendix on safeguards for tanks in flooded regions.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Flash Point Test-Pensky-Martens Closed Cup Tester. For determining the flash point of fuel oils, cut-back asphalts, and other viscous materials and suspensions of solids. Describes apparatus, procedure, flash point, barometric pressure, and reproducibility of results.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Gasoline and Kerosene on the Farms. Covers the safe use and storage of gasoline and kerosene; including starting fires, oil lamps, heaters, stoves, incubators, brooders, and lanterns; cleaning hazards, spraying disinfectants, paints and lacquers, lighting and cooking systems, automobiles, trucks, tractors, and stationary engines; transferring to another container, fuel-oil burners, proper storage, and extinguishing of gasoline and kerosene fires.

Natural Gasoline Assn. of America. Standard Factors for Volume Correction and Specific Gravity Conversion of Liquefied Petroleum Gases and Volatile Gasolines.

Natural Gasoline Assn. of America. Standard Method for Determining the Specific Gravity of Volatile Hydrocarbon Products by Means of the Hydrometer.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. Includes SAE Recommended Practice Method of Rating Fuels for Detonation. Revised, 1936.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C19; 1924. Standard Density and Volumetric Tables. Includes comparison table of degrees Baumé, degrees A.P.I., pounds per gallon, and specific gravity, also tables for graduation of various types of hydrometers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C410; 1936. National Standard Petroleum Oil Tables. Approved by the American Petroleum Institute, American Society for Testing Materials, and the U. S. Bureau of Mines. The tables contained in this circular are based largely on an investigation of American petroleum oils, both crude and refined; A.P.I. scale chosen as standard for density measurement. Tables converting observed degrees A.P.I. volume and specific gravity to corresponding values at 60° F., and tables converting degrees A.P.I. to specific gravity, pound per gallon, and degrees Baumé.

U. S. Gov., Federal Specification VV-L-791b; 1942. Lubricants and Liquid Fuels; General Specifications (Methods for Sampling and Testing). Gives a detailed description of the various methods of test for lubricants and liquid fuels, apparatus, and drawings.

503.1 BENZINE AND PETROLEUM ETHER

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A. Twelfth Revision, 1942. Purified Benzin (Petroleum Ether, Purified Petroleum Benzin). Description, solubility, specific gravity, distillation range, nonvolatile residue, sulfur compounds, sulfur compounds or silver-reducing substances, benzene, and storage.

U. S. Gov., Federal Specification 0-E-751; 1931. Ether; Petroleum. Covers two grades, A and B. Gives requirements for color, moisture and sediment, boiling point range, limit of residue, spot test, acidity, and benzene hydrocarbons; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions, methods of sampling and testing, *see* 503.0.

503.2 DISTILLATES OF PETROLEUM

American Society for Testing Materials, D 86-40; 1940. American Assn. of State Highway Officials, T 115-42. American Petroleum Institute Standard, 507-40. American Standards Assn., Z11.10-1940. Method of Test for Distillation of Gasoline, Naphtha, Kerosene, and Similar Petroleum Products. Includes specifications for low-distillation and for high-distillation thermometers, graduated in centigrade or Fahrenheit, dimensions, graduation, construction, standardization, accuracy, test for permanency of range, for ranges of 0° to 300° C. and of 0° to 400° C.

American Society for Testing Materials, D 235-39; 1939. American Assn. of State Highway Officials, M 128-42. Petroleum Spirits (Mineral Spirits). Apply only to petroleum distillates. Requirements for appearance, color, flash point, blackening, distillation, dry point, and acidity of distillation residue, using tests by A.S.T.M. methods.

American Society for Testing Materials, D 484-40; 1940. American Petroleum Institute Standard, 537-40. American Standards Assn., Z11.42-1940. Stoddard Solvent. For a petroleum distillate of low flammability used in dry cleaning. Requirements and methods of testing for color, corrosive properties, doctor test, sulfuric acid absorption, flash point, distillation, acidity, and cleansing of containers.

National Assn. of Dyers and Cleaners of the U. S. and Canada. Fatty Acids in Dry-Cleaning Solvents, T-70; 1939. The main impurities which accumulate in dry-cleaning solvent and which may cause trouble are fatty acids. Gives method of testing for dry cleaners to determine when fatty acids have accumulated to such an extent that odor troubles may result.

National Assn. of Dyers and Cleaners of the U. S. and Canada. Laboratory Tests on Solvent, T-62; 1938. For new and used solvents both petroleum solvents and synthetic solvents. Tests on new solvent include appearance, color, odor, flash point, corrosion, distillation range, acidity, doctor test, and sulphuric acid absorption test; and tests on used solvent include acid number, residue, distillation range, flash point, rancidity, moisture, and color.

National Assn. of Dyers and Cleaners of the U. S. and Canada. Solvent Tests for the Dry-Cleaning Room, T-59; 1938. Cleaning room tests for soap, alkali, and moisture. Covers acid number, materials necessary, procedure, moisture, and soap.

Society of Automatic Engineers. Aeronautical Material Specification 3160; 1943. Solvent Petroleum. A carefully refined straight-run distillate from crude petroleum without the admixture of benzol, ether, alcohol, chlorinated hydrocarbons, and other compounds not occurring naturally in crude petroleum. Requirements, quality, reports, identification, approval, and rejection. Similar to Federal Specification P-S-661.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-37-1; 1944. Trichlorethylene; Stabilized.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS3-40; 1940. Stoddard Solvent. This commercial standard covers physical and chemical properties, methods of testing, and certification of a grade of petroleum distillate of low flammability used in dry cleaning. Covers general requirements relative to material, color, odor, flash point, distillation, etc.; also methods of sampling, inspection, and testing. Initiated by the National Assn. of Dyers and Cleaners of the U. S. and Canada.

U. S. Gov., Federal Specification P-S-661a; 1938. Amendment 1; 1940. Solvent; Dry-Cleaning. Covers a petroleum distillate known as "Stoddard Solvent." Gives requirements for appearance, color, odor, corrosive properties, flash point; methods of inspection, sampling, and tests; and requirements for packaging, packing, and marking for shipment. (Conforms to requirements of Stoddard Solvent Commercial Standard CS3-40 issued by the U. S. Gov., National Bureau of Standards.)

U. S. Gov., Navy Dept. Specification 7F1; 1945. Fluid (Oil); Fog, No. 1.

U. S. Gov., Treasury Dept., Procurement Div., No. 721; 1945. Door-Check Liquid. Covers one type and one grade and shall be a well-refined petroleum oil. Gives requirements for appearance, viscosity, pour point, acidity, corrosion test, and flash point; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-133; 1941. Trichlorethylene; Technical.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0; petroleum thinners for paint, *see* 848.7; benzine, petroleum ether, *see* 503.1; gasoline and naphtha, *see* 503.3; kerosene, *see* 503.5; mineral seal oil, *see* 503.6; long time burning oil, *see* 503.7; lubricating oils, *see* 504; transformer oils, *see* 504.8.

503.3 GASOLINE AND NAPHTHA

American Assn. of State Highway Officials, M83-42. Standard Specifications for Liquefier. Covers liquefier to be used in preparation of bituminous mastic bedding for brick pavement. Gives general requirements, distillation, methods of sampling and testing, and table showing initial boiling point, fifty percent over, and end point for light and heavy grade.

American Gas Assn. and Natural Gasoline Assn. of America. Standard Compression and Charcoal Tests for Determining the Natural Gasoline Content of Natural Gas, Testing Code 101-43; 1943. Gives a general discussion of the purpose and general facts concerning the problem of testing natural gas for gasoline content; standard compression test including apparatus, diagrams, procedure of test, and computation of yield; standard charcoal test including adsorption apparatus and materials, diagrams, adsorption procedure, distillation apparatus and materials, distillation procedure, and computation of results; and appendices.

American Petroleum Institute, Div. of Production. Code 50-A; 1942. Code for Measuring, Sampling, and Testing Natural Gas (Tentative). Contains sections on measuring natural gas (with appendixes on pressure bases and special extension tables), on sampling, determination of specific gravity, fractional analysis, determination of hydrogen sulfide, carbon dioxide, water vapor, free oxygen, heating value, and gasoline content.

American Petroleum Institute, Div. of Production. Code 50-B; 1942. Code for Measuring, Sampling, and Testing Natural Gasoline. Includes sections on storage and measurement, sampling, determination of gravity, color, doctor test, corrosion, vapor pressure, and distillation selected from standards now in use.

American Society for Testing Materials, D 130-30; 1930. American Petroleum Institute Standard, 521-30. American Standards Assn., Z11.21-1930. Method of Test for Detection of Free Sulfur and Corrosive Sulfur Compounds in Gasoline. Test procedure using discoloration of mechanically polished copper strip method.

American Society for Testing Materials, D 156-38; 1938. American Petroleum Institute Standard, 530-38. American Standards Assn., Z11.35-1938. Method of Test for Color of Refined Petroleum Oil by Means of Saybolt Chromometer. For color of naphthas, kerosene, etc. Description of Saybolt chromometer and procedure for comparing color of oil with standard color disks.

American Society for Testing Materials, D 216-40; 1940. American Petroleum Institute Standard, 508-40. American Standards Assn., Z11.11-1940. Method of Test for Distillation of Natural Gasoline. Dimensions of Engler flask, and apparatus for distillation test, collection of sample, and outline of procedure, with correction for barometric pressure.

American Society for Testing Materials, D 381-44; 1944. American Petroleum Institute Standard, 529-44. American Standards Assn., Z11.36-1944. Method of Test for Gum Content of Gasoline. For comparative indication of amount of gum deposition which may take place in service, but not for gum stability in storage; includes description and assembly of apparatus and outline of procedure.

American Society for Testing Materials, D 439-40 T; 1940. Tentative Specifications for Gasoline. For use of purchasing agencies in formulating specifications for purchase of gasoline under contract. Does not include all types of motor fuel as some trucks and busses may require lower vapor pressures and higher distillation temperatures. Includes types for normal, high volatility, and relatively nonvolatile fuel; provides for automatic variation by seller to meet seasonal changes and locality by providing three vapor pressures and four geographic sections by States with schedules of specified variations; and methods of testing.

American Society for Testing Materials, D481-39; 1939. American Petroleum Institute Standard, A.P.I., 531-39. Method of Test for Acid Heat of Gasoline. For acid heat of aviation and motor gasolines with Reid vapor presures under 15 lb., roughly indicative of the amount of unsaturated hydrocarbons in the gasoline that are reactive with sulfuric acid. Description of apparatus, reagent necessary, test sample, and method of procedure.

American Society for Testing Materials, D525-42T; 1942. Tentative Method of Test for Oxidation Stability of Gasoline. For an accelerated oxidation test by means of which the induction period is determined as an indication of the tendency to form gum in storage. Requirements for apparatus, details of bomb, and test procedure.

American Society for Testing Materials, D526-42; 1942. American Petroleum Institute Standard, 542-42. American Standards Assn., Z11.48-1942. Method of Test for Tetraethyl Lead in Gasoline. For ethyl gasoline and other volatile distillates, conversion of tetraethyl lead to lead chloride by refluxing with hydrochloric acid and the lead determined volumetrically by titration with ammonium molybdate or gravimetrically as the chromate or sulfate. Dimensions of extractor, reagents required, and method of procedure.

American Society for Testing Materials, ES-45; 1943. Emergency Method of Test for Olefins, Aromatics, Parafins, and Naphthenes in Aviation Gasoline (Without Distillation Into Fractions). Gives scope, principle of method, determination of olefins, determination of aromatics, determination of paraffins and naphthenes, and appendices.

American Society for Testing Materials, ES-46; 1943. Emergency Method of Test for Benzene, Toluene, and Higher-Boiling Aromatics in Aviation Gasoline. Gives scope, outline of method, apparatus, procedure, calculation and report, and reproducibility and accuracy.

American Transit Assn. Recommended Rules of Regulations for Handling of Gasoline, E133-33; 1933. Recommends certain precautionary measures in connection with the handling of gasoline at filling stations where inflammable liquids are transferred from storage tanks to the tanks of buses, trucks, airplanes, rail motor coaches, and internal-combustion locomotives.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Naphtha. Covers definition, types, general properties, uses, sources, and shipping regulations.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Gasoline (Automotive Fuel). Covers definition, properties, lubricating properties, derivation, grades, purity, substitutes, marketing method, shipping regulations, and uses.

Natural Gasoline Assn. of American. Liquefied Petroleum Gas Specifications and Test Methods, Tentative Standards. Revised, July 1940. Includes definitions for commercial propane, commercial butane, and butane-propane mixtures; mercury-freezing test for determination of the nature and extent of contamination of commercial propane with heavier hydrocarbon materials; method for determination of vapor pressures of liquefied petroleum gas products; open cylinder weathering test for determination of the nature and extent of contamination of commercial butanes with heavier hydrocarbon materials; cobalt bromide test for qualitative determination of the water content of commercial propane; specific gravity method for the determination of the specific gravity of volatile hydrocarbon liquids; and total sulphur method for the determination of total sulphur in liquefied petroleum gas products.

Natural Gasoline Assn. of America. Official Specifications and Methods of Sampling and Testing for Natural Gasoline, effective Jan. 1, 1938. Includes definitions, sampling methods and containers, tests, and abridged volume correction table. Sampling methods and containers same as American Petroleum Institute Code 50-B; Reid vapor pressure test, corrosion test, color test, and distillation test, same as American Society for Testing Materials Specifications D 323-41, D 130-30, D 156-38, and D 216-40, respectively.

Technical Assn. of the Pulp and Paper Industry. Analysis of Gasoline Standard, T 601 m-35; 1935. For use in automobiles and similar engines, requirements on freedom from water and suspended matter, corrosion test, distillation range, allowable sulphur, vapor pressure, and methods of test according to A.S.T.M. and Federal Specification VV-G-101.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-22; 1943. Fuel; Aircraft-Engine, Grade 62.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-23-1; 1943. Fuel; Grade 73 Aircraft-Engine.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-24-2; 1943. Fuel; Grade 80 Aircraft-Engine.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-25-3; 1943. Fuel; Grade 87 Aircraft-Engine.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-26-2; 1943. Fuel; Aircraft-Engine Grade 91.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-3; 1942. Naphtha; Petroleum Aliphatic.

U.S.Gov., Army-Navy Aeronautical Specification AN-VV-F-746-1; 1940. Fuel; Aircraft-Engine, General Specification (Method for Knock-Test).

U.S. Gov., Army-Navy Aeronautical Specification AN-VV-N-96-3; 1944. Naphtha; Petroleum, Aromatic.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-150-S. Gas; Liquid, for Torches.

U. S. Gov., Federal Specification VV-G-101a; 1936. Amend 1; 1944. Gasoline; Motor, U. S. Government. Covers one grade. Gives requirements for sampling, inspection, and test, distillation, vapor pressure, sulphur, and corrosion; and packing and marking.

U. S. Gov., Federal Specification VV-M-564; 1943. Motor Fuel R. Shall be one type with automatic provisions for locality and climatic conditions. Gives detail requirements as to sampling, inspection, and test.

U.S. Gov., Federal Specification VV-M-567; 1943. Motor-Fuel S. Shall be of one type only with automatic provisions for locality and climatic conditions. Covers a hydrocarbon fuel, free from tetraethyl lead or other octane improvers, water, and suspended matter. Gives requirements for distillation test, residue, vapor pressure, octane number, gum, sulfur, corrosion, and modifications for seasons and altitude; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification VV-M-571b; 1941. Motor Fuel V. Covers one grade— suitable for use as fuel in internal combustion engines, with modifications for altitude and type of equipment. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 7M1b; 1943. Motor-Fuel V.

U. S. Gov., Navy Dept. Specification 52N1b; 1941. Naphtha; Coal-Tar.

U. S. Gov., U. S. Army, Army Air Forces. Specification 4-1040; 1931. Naphtha; Lacquer Diluent.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-103B; 1943. Motor Fuel (All Purpose).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-114; 1942. Motor Fuel; 72 Octane.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-116; 1943. Gasoline (Unleaded and Undyed).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-180; 1943. Thinner; Naphtha, Low-boiling.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0; rating of gasoline for detonation, *see* 503.0; solvent naphtha (xylene), *see* 801.8.

503.4 FUEL AND GAS OILS

American Hospital Assn., 31-1. Fuel Oils. Covers 5 grades. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Commercial Standard 12-40 for Fuel Oils and American Society for Testing Materials D 482-38T, Tentative Method of Test for Ash Content of Petroleum Oils.

American Society of Mechanical Engineers. Power Test Code. Liquid Fuels, 1930. Specifies standard methods for a determination of those ascertainable chemical and physical properties which serve as indicators of the value of those liquid fuels which are extensively used in the generation of heat and power. With auxiliary sections on general considerations, temperature measurement, heat of combustion, flue and exhaust gas analysis, measurement of time, density determinations, and determination of viscosity of liquids.

American Society for Testing Materials, D158-41; 1941. American Petroleum Institute Standard, 512-41. American Standards Assn., Z11.26-1941. Method of Test for Distillation of Gas Oil and Similar Distillate Fuel Oils. For distillates having viscosities intermediate between kerosene and lubricating oil. Description of Saybolt distilling flask, condenser, heater, and graduates, preparation of apparatus, and outline of procedure.

American Society for Testing Materials, D 396-39 T; 1939. Tentative Specifications for Fuel Oils. Covers five grades of fuel oil for various types of fuel-oil-burning equipment, general requirements, and table of detailed requirements of various grades.

American Society for Testing Materials, D 473-38 T; 1938. Tentative Method of Test for Sediment in Fuel Oil by Extraction. Determination of sediment by extraction with 90 percent benzol, design of apparatus, and method of procedure.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Fuel Oil. Covers definition, source, grades, chemical composition, properties, impurities, shipping regulations, uses, ordering instructions, oil measurement, and industry standards and tests; also definition, characteristics, derivation, general specifications, and invoicing for Oil, Bunker "C."

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Liquefied Petroleum Gases. Standards for the design, installation, and construction of containers and pertinent equipment for the storage and handling of liquefied petroleum gases. Covers application of rules, basic rules, systems utilizing I.C.C. containers, systems utilizing containers other than I.C.C., tank trucks for liquefied petroleum gases, liquefied petroleum gas as a motor fuel, storage of containers not installed for use at final utilization point, and required sizes of safety valves for containers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS12-40; 1940. Fuel Oils. This commercial standard covers five grades of fuel oil for various types of fuel oil burning equipment. The standard includes detail requirements covering description of each grade of fuel oil, flash point, pour point, carbon percentage of carbon residue, distillation temperatures, and viscosity in seconds. Initiated by American Oil Burner Assn., now the Oil Burner Institute.

U. S. Gov., Federal Specification VV-O-326; 1943. Oil; Fuel (for Oil Burners). Covers five grades. Shall be a hydrocarbon oil, free from grit, dirt, and fibrous material. Gives detail requirements as to methods of sampling, inspection, and tests.

U. S. Gov., Navy Dept. Specification 7-O-1f; 1944. Oil; Fuel, Boiler.

U. S. Gov., Navy Dept. Specification 7-O-2d; 1943. Oil; Fuel, Diesel.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-102B; 1941. Oil; Fuel, Diesel for High Speed, Automotive Type, Diesel Engines.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0; gasoline and naphtha, *see* 503.3; kerosene, *see* 503.5.

503.5 KEROSENE AND SIMILAR ILLUMINATING OILS

American Society for Testing Materials, D 187-39; 1939. American Petroleum Institute Standard, 502-39. American Standards Assn., Z11.17-1939. Method of Test for Burning Quality of Kerosene Oils. For burning quality of ordinary kerosene used for illuminating purposes, description of standard brass Saybolt test lamp, Miller No. 2 burner, MacBeth-Evans No. 514 pearl top chimney, detailed dimensions of burner, wick, balance and sight gage, and test procedure.

U. S. Gov., Federal Specification VV-K-211a; 1941. Kerosene. Covers one grade—suitable for ordinary use as an illuminating oil. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0; mineral seal oil, *see*

503.6; long-time burning oil, *see* 503.7; gasoline and naphtha, *see* 503.3.

503.6 MINERAL SEAL OIL

American Society for Testing Materials, D239-30; 1930. American Petroleum Institute Standard, 504-30. American Standards Assn., Z11.18-1930. Method of Test for Burning Quality of Mineral Seal Oil. For burning quality of special illuminating oil known as mineral seal oil, 300 oil, or mineral colza oil, used in railway coach lamps. Using Dressel standard No.520 side lamp; dimensions of font, burner, chimney, and wick; sight gage and outline of procedure.

U. S. Gov., Federal Specification VV-O-391; 1933. Oil; Illuminating (300° Mineral-Seal). Covers one grade, suitable for use where a high-flash illuminating oil is required. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 1408c; 1934. Oil; Mineral, Light-Colored (for Cordage Oils).

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0.

503.7 LONG-TIME BURNING (SIGNAL) OIL

American Society for Testing Materials, D219-36; 1936. American Petroleum Institute Standard, 503-36. American Standards Assn., Z11.19-1936. Method of Test for Burning Quality of Long-Time Burning Oil for Railway Use. For special kerosene oil used in railway semaphore signal lamps; includes standard semaphore lamp; dimensions of burner; gray round felt wick and chimney; sight gage and test procedure.

U. S. Gov., Federal Specification VV-O-381; 1933. Oil; Illuminating, Long-Time Burning. Covers one grade, suitable for use where a long-time burning oil is required. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0.

504. LUBRICATING OILS, INSULATING OILS, AND GREASES (INCLUDES PARAFFIN OIL)

References.—Animal oils and greases, *see* 040-043; vegetable oils, *see* 142.

504.0 GENERAL ITEMS

American Assn. of State Highway Officials, T79-42. Standard Method of Test for Flash Point With Tagliabue Open Cup. For use with material having a flash point of less than 175° F. Gives details for this method of test.

American Gear Manufactures Assn. Standard 254.01; 1944. Data Sheet—Basic Information on Lubricating Oils. To give elementary data on the properties of oils used in enclosed and open gearing. Covers viscosity, flash point, pour point, carbon residue, neutralization number, specific gravity, viscosity index, paraffin base oils, compounded oil, deterioration of oils, extreme pressure, and liquid lubricants.

American Gear Manufactures Assn. Standard 250.01; 1944. Lubrication of Enclosed and Open Gearing, Tentative. Covers the method of lubricating and the type and grade of oil to be used in enclosed gear drives and open gearing. Applicable to helical, herringbone, straight bevel, spiral bevel, worm, hypoid, and spur types of gearing. Gives limitations, lubrication of gear teeth, temperature, type of oil, viscosity, methods of lubrication, lubrication recommendations, and maintenance.

American Gear Manufactures Assn. Standard 254.04; 1944. Data Sheet—Data on Extreme Pressure Lubricants. Gives a detailed discussion concerning where gear teeth are subjected to very heavy loads that may cause scuffing or excessive wear and abrasion, gears that run hot due to an overload, and extreme pressure lubricants necessary for such gears.

American Gear Manufacturers Assn. Standard 254.05; 1944. Data Sheet—Lubrication of Nonmetallic Gearing. Discusses gears made of phenolic compounds such as bakelite, also vulcanized fiber and other nonmetallic materials, and pinions made from these materials used in contact with steel or cast iron gears. Gives requirements for lubrication of these nonmetallic gears and pinions.

American Leather Chemists Assn. Methods of Sampling and Analysis. Mineral Oil, 1942. Gives requirements for evaporation loss.

American Oil Chemists' Society. Standard Methods for the Sampling and Analysis of Commercial Fats and Oils, 1943. Applies to fats and fatty oils used in the soap, candle, and tanning industries, to edible fats and oils, to fats and fatty oils intended for lubricating and burning purposes, and to the raw oils used in the varnish and paint industry, but not intended for waxes. Covers sampling; analysis for moisture and volatile matter, insoluble impurities, soluble mineral matter, fatty acids combined as mineral soap, free fatty acids, titer, unsaponifiable matter, iodine number, saponification number, melting point, softening point, slipping point, flowtest, cloud test, bleach test, Halphen test (for cottonseed oil), modified Vallavecchia test, Reichert-Meissl and Polenske numbers, Kirschner value, index of refraction, specific gravity, acetyl and hydroxyl value; smoke, flash, and fire points; F.A.C. standard colors, modified Wiley melting point method, thiocyanogen method, and Twitchell method.

American Society of Mechanical Engineers. General Discussion on Lubrication, 1938. The information was arranged with the cooperation of 51 engineering societies and covers the whole field of the practice and theory of lubrication. Covers journal and thrust bearings, engine lubrication for internal combustion and reciprocating steam engines, industrial applications, and properties and testing.

American Society of Mechanical Engineers. Power Test Codes, Auxiliary Section. Part 17—Determination of the Viscosity of Liquids, 1931. Outlines procedure to follow and precautions to be observed in taking readings. Describes types of viscometers.

American Society for Testing Materials, D 88-44; 1944. American Petroleum Institute Standard, 518-44. American Assn. of State Highway Officials, T 72-44. American Standards Assn., Z11.2-1944. Method of Test for Viscosity by Means of the Saybolt Viscosimeter. Covers use of Saybolt Universal viscosimeter for general use, and of Saybolt Furol viscosimeter for fuel and road oils, dimensions and design of apparatus, temperatures of tests, and outline of procedure.

American Society for Testing Materials, D 91-40; 1940. American Petroleum Institute Standard, 527-40. American Standards Assn., Z11.30-1940. Method of Test for Precipitation Number of Lubricating Oils. For steam cylinder stocks and black oils and may be used for other lubricating oils. Definition, centrifuge, centrifuge tubes, petroleum naphtha diluent, and method of procedure for determinations.

American Society for Testing Materials, D 92-33; 1933. American Assn. of State Highway Officials, T 48-42. American Petroleum Institute Standard, 511-33. American Standards Assn., Z11.6-1933. Method of Test for Flash and Fire Points by Means of Open Cup. For all petroleum products except fuel oils and those having an open cup flash below 175° F. Includes description of Cleveland open cup, heating plate, and procedure for flash and fire points.

American Society for Testing Materials, D 97-39; 1939. American Petroleum Institute Standard, 506-39. American Standards Assn., Z11.5-1939. Method of Test for Cloud and Pour Points. Cloud point test limited to transparent oil for determining temperature at which paraffin wax or other solids begin to separate when oil is chilled, and pour point test for lowest temperature at which oil will flow under prescribed conditions. Description of apparatus and methods of procedure, with special procedures for black oils, cylinder stocks, and non-distillate fuel oils. A.S.T.M. Emergency Alternate Provision, EA-D 97; 1944, affected section 5, Procedure for Pour Point.

American Society for Testing Materials, D128-40; 1940. American Petroleum Institute Standard, 501-40. American Standards Assn., Z11.16-1940. Methods of Analysis of Grease. Methods for determination of fillers, ash, soap bases, soap, fat, water, excess alkali or acid, petroleum products, and unsaponifiable matter; qualitative tests for glycerine and preparation of solvents.

American Society for Testing Materials, D 155-39 T; 1939. Tentative Method of Test for Color of Lubricating Oil and Petrolatum by Means of A.S.T.M. Union Colorimeter.--Gives description of special colorimeter, lists glass color standards, and procedures for light and for dark lubricating oils and petrolatum.

American Society for Testing Materials, D 157-36; 1936. American Petroleum Institute Standard, 515-36. American Standards Assn., Z11.15-1936. Method of Test for Steam Emulsion of Lubricating Oils. Covers turbine oils, and where emulsion, demulsibility, or emulsification test is required for any oil. Steam emulsification number, by time in seconds for oil to separate when emulsified under specified conditions, description of apparatus, and test procedure.

American Society for Testing Materials, D189-41; 1941. American Petroleum Institute Standard, 505-41. American Standards Assn., Z11.25-1941. Method of Test for Carbon Residue of Petroleum Products (Conradson Carbon Residue). For the relative carbon-forming propensity of lubricants for internal-combustion engines, domestic oil fuels, and oils used in the manufacture of gas. Describes evaporating apparatus insulator and burner, with standard procedure, and special procedures for high and for low carbon residues.

American Society for Testing Materials, D217-44; 1944. Tentative Method of Test for Consistency of Lubricating Greases and Petrolatum. For measuring with a penetrometer the unworked or the worked consistency of lubricating greases and the original consistency of petrolatum. Gives apparatus, procedure, and number of tests required for lubricating grease and for petrolatum.

American Society for Testing Materials, D 270-33; 1933. American Petroleum Institute Standard, 528-33. American Standards Assn., Z11.33-1935. Methods of Sampling Petroleum and Petroleum Products. Includes all petroleum products except gases. Requirements for experienced personnel and description of apparatus; for bottle or beaker sampling of tank cars and trucks; and shore, ship, or barge tanks; continuous sampling of pipe lines, dipper sampling of streams; thief sampling of cans, drums, and tank cars; borings sampling of wax, soft solids in cases, cakes, bags, or barrels; and grab sampling of lumpy material in bins, bunkers, sacks, and barrels.

American Society for Testing Materials, D 287-39; 1939. American Petroleum Institute Standard, 526-39. American Standards Assn., Z11.31-1939. Method of Test for Gravity of Petroleum and Petroleum Products by Means of the Hydrometer. Covers the determination of the specific gravity and the A.P.I. gravity of crude petroleum and petroleum products normally handled as liquids. The determination of the gravity of mixtures of petroleum products with other substances is treated as a special case, owing to the fact that the coefficient of expansion of such mixtures may not be the same as those of petroleum or its products. The determination of the specific gravity of road oils, road tars, asphalt cements, and soft tar pitches is covered by the Standard Method of Test D 70 of the American Society for Testing Materials, and the testing of these products is, therefore, specifically excluded from the scope of this method.

American Society for Testing Materials, D 322-35; 1935. American Petroleum Institute Standard, 524-35. American Standards Assn., Z11.29-1935. Method of Test for Dilution of Crankcase Oils. Gives amount of dilution when gasoline has been used as fuel. Description of dilution trap, test apparatus, and method of procedure.

American Society for Testing Materials, D 445-42 T; 1942. Tentative Method of Test for Kinematic Viscosity. Intended for determining the Kinematic viscosity of any petroleum product or lubricant which is a true viscous liquid at the temperature of the test. Gives apparatus, procedure, calibration, and reporting results.

American Society for Testing Materials, D 446-39; 1939. American Petroleum Institute Standard, 534-39. American Standards Assn., Z11.46-1941. Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity. Includes table of values and equation for converting kinematic viscosity in centistokes at any temperature to Saybolt viscosity in seconds at the same temperature.

American Society for Testing Materials, D524-42; 1942. American Petroleum Institute Standard 541-42. American Standards Assn., Z11.47-1942. Method of Test for Carbon Residue of Petroleum Products

(Ramsbottom Carbon Residue). Test for relative carbon-forming propensities of oils but in general not numerically equal to the Conradson carbon residue values. Design and dimensions of coking bulb, other apparatus requirements, and outline of test procedures. Emergency Alternate Provisions EA-D524; 1942, affected section 2, Apparatus; and section 3, Procedure.

American Society for Testing Materials, D567-41; 1941. American Petroleum Institute Standard, 540-41. American Standards Assn., Z11.45-1941. Method for Calculating Viscosity Index. Provides a means for calculating the viscosity index of a petroleum product or lubricant from its viscosity at 100° and 210° F. Gives definitions, formulas and tables, calculation, reproducibility, and tables showing values.

American Society for Testing Materials, D663-44T; 1944. Tentative Method of Test for Acid and Base Numbers of Petroleum Products by Color-Indicator Titration. Designed to indicate in petroleum products and lubricants and compounded products the presence of organic constituents having acid or basic characteristics. Gives definitions, outline of method, apparatus, reagents, procedure, and calculation and report.

American Society for Testing Materials, D664-44T; 1944. Tentative Method of Test for Acid and Base Numbers of Petroleum Products by Electrometric Titration. Designed to indicate in petroleum products and lubricants and compounded products the presence of organic constituents having acid or basic characteristics. Gives definitions, outline of method, apparatus, preparation of electrode system, procedure, calculation, and report.

American Society for Testing Materials, D808-44T; 1944. Tentative Method of Test for Chlorine in Lubricating Oils by Bomb Method. Gives scope, outline of method, apparatus, reagents, procedure, volumetric determination of chlorine, and gravimetric determination of chlorine.

American Society for Testing Materials, D809-44T; 1944. Tentative Method of Chemical Analysis for Phosphorus in Lubricating Oils. Gives scope, outline of method, apparatus, reagents, procedure, and reproducibility.

American Society for Testing Materials, D 810-44T; 1944. Tentative Chemical Analysis for Lead. Copper and Iron in Lubricating Oils. Gives scope, outline of method, preparation of sample, preliminary separations, apparatus, reagents, and procedure for determining lead, copper, and iron.

American Society for Testing Materials, D 811-44T; 1944. Tentative Chemical Analysis for Metals in Lubricating Oils. Gives scope, outline of method, preparation of sample, preliminary separations, apparatus, reagents, and procedure for determining tin, silica, barium, zinc, aluminum, calcium, magnesium, sodium, and potassium.

American Society for Testing Materials, ES-42; 1944. Emergency Method of Test for Isopentane and Benzene Insolubles in Used Lubricating Oils. Gives scope, definitions, outline of method, apparatus, reagents and solvents, preparation of sample, procedure, calculation and reporting, and precision.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Oils; Lubricating. Covers definition, description, derivation, grades, production, specification factors, tests, packing, specifications, and marketing.

National Lubricating Grease Institute. Tentative N.L.G.I. Classification of Semi-Fluid Greases. Covers grade numbers—0, 1, 2, 3, 4, 5, and 6. This classification is based on consistency only and is not intended to evaluate factors of apparent viscosity, type of soap, mineral oil constituent, or quality. Method of test is identical with A.S.T.M. D 217-38T with designated modifications.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. Recommended Practice for Engine Tests for Evaluating Crankcase Oils. Revised, 1944. Covers measuring bearing corrosion, determining the oxidization resistance, and measuring other properties of oil such as detergency, ring sticking, and piston scuffing.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE General Information for Corresponding Ranges in Kinematic, Redwood and Engler Viscosities. Adopted, 1940. Gives tables covering crankcase oils and covering transmission and axle lubricants.

U. S. Gov., Army Air Forces. Specification 3601; 1943. Oil; Petroleum (for Thinning Lubricants).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Oil Samples, Sample No. 387d; Report of Absolute Viscosity, sample No. 387a; Report of Kinematic Viscosity, Sample No. 387b; and Report of Saybolt Viscosity, Sample No. 387c. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis, for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Federal Specification VV-L-791b; 1942. Lubricants and Liquid Fuels; General Specifications (Methods for Sampling and Testing). Gives a detailed description of the various methods of test for lubricants and liquid fuels, apparatus, and drawings.

504.1 SPECIAL LUBRICATING OILS

504.11 Heavy Asphaltic Lubricating Oils

504.12 Lubricating Oils for Car Axle Generators

504.13 Journal Box Lubricating Oils

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Renovated Car Oil, M-904-40; 1940. Specifications for oil acceptable for use in journal box packing for freight and passenger cars, includes field samples, laboratory samples, properties and tests, and methods of analysis.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual Standard and Recommended Practice, 1944. New Car Oil. Specifications M-906-39; 1939. For saturating waste in journal box packing, free oiling, or as specified. Gives properties and tests, and test for tarry matter and insoluble impurities (dirt).

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0.

504.14 Mineral Lubricating Oils

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0; journal box oil, *see* 504.13; misc. lubricating oils, *see* 504.19; cylinder and engine oils, *see* 504.2; machine lubricating oils, *see* 504.3; paraffin oil, *see* 504.53; transformer and switch oils, *see* 504.8.

504.19 Miscellaneous Lubricating Oils

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 102-40; 1941. Zero Fahrenheit Lubricating Oil; Summer Grade. For use in lubricating signal mechanism, not relays or dash pots, down to 0° F. Details for flash point, viscosity, pour, moisture, sulphur, and acid tests, and for labeling.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 103-40; 1941. 45 Degrees Below Zero Fahrenheit Lubricating Oil, Winter Grade. For low-temperature use in lubrication of signal mechanism; not to be used in oil dash pots. Oil to be free from animal or vegetable oils and fats; flash point, fire, viscosity, pour, acid, sulphur, and moisture test requirements.

U. S. Gov., Army Air Forces. Specification 3582A-2; 1944. Oil; Lubricating and Preservative.

U. S. Gov., Army Air Forces. Specification 3606; 1945. Oil; Low-Temperature Lubricating.

U. S. Gov., Army-Navy Aeronautical Specification AN-0-3—3; 1944. Oil; Low-Temperature Lubricating Gear.

U. S. Gov., Army-Navy Aeronautical Specification AN-0-4; 1943. Oil; Gyro Instrument Lubricating.

U. S. Gov., Army-Navy Aeronautical Specification AN-0-6a-2; 1945. Oil; General Purpose, Low-Temperature Lubricating.

U. S. Gov., Federal Specification VV-0-471; 1945. Oil; Lubricating, Car and Locomotive-Engine. Covers one grade. Gives general requirements, flash point, viscosity, pour point, water, neutralization number, and precipitation number; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification VV-0-526; 1943. Oil; Lubricating, Machine. Covers four grades designated by the numbers 8, 10, 20, and 30, and shall be a refined petroleum oil suitable for general lubrication of machinery. Gives requirements for viscosity, flash point, pour point, carbon residue, neutralization number, and corrosion; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 14 L 9; 1943. Lubricant; General-Purpose, No.1.

U. S. Gov., Navy Dept. Specification 14 L 10; 1943. Lubricant; General-Purpose, No.2.

U. S. Gov., Navy Dept. Specification 14 L 11; 1943. Lubricant; Water-pump, No.4.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-60D; 1943. Oil; Lubricating, Car and Locomotive Engine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-120; 1944. Oil; Lubricating Preservative, Special.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0.

504.2 CYLINDER OILS

504.21 Compressor Oils, for Air and for Ammonia Compressors

U. S. Gov., Federal Specification VV-0-581; 1934. Oil; Lubricating, Refrigerating-Machine. Suitable for the lubrication of the cylinders of refrigerating machines. Covers five grades—8, 10, 20, 30, and 40. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0.

504.22 Engine Oils, for Steam Engine Cylinders and for Turbines

U. S. Gov., Federal Specification VV-0-541; 1935. Oil; Lubricating, Marine Engine, Compounded. Covers one grade, suitable for the lubrication of reciprocating steam engines in marine service. Gives detail requirements; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification VV-0-551; 1935. Oil; Lubricating, Marine Engine, Mineral. Covers one grade, suitable for the lubrication of reciprocating steam engines in marine service. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing and marking for shipment.

U. S. Gov., Federal Specification VV-0-601; 1935. Oil; Lubricating, Steam-Cylinder, Compounded. Suitable for the lubrication of steam cylinders of noncondensing engines and pumps. Covers three grades—1, 2, and 3. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification VV-0-611; 1935. Oil; Lubricating, Steam-Cylinder, Mineral. Suitable for the lubrication of noncondensing steam engine cylinders. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification VV-0-661; 1934. Oil; Lubricating, Turbine, Dynamo, and High-Speed Steam Engine. Suitable for the lubrication of turbines, dynamos, and high-speed steam engines. Covers five grades—8, 10, 20, 25, and 30. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0.

504.23 Cylinder Oils, for Internal Combustion Engines

U. S. Gov., Army Air Forces. Specification 3583; 1937. Oil Text (Lubricating)— Multi-Cylinder Engine, General Specification for.

U. S. Gov., Army Air Forces. Specification 3594; 1940. Oil; Lubricating, Class D (for Internal-Combustion Engines Other Than Aircraft and Diesel).

U. S. Gov., Army-Navy Aeronautical Specification AN-VV-0-446a; 1943. Oil; Lubricating, Aircraft-Engine.

U. S. Gov., Federal Specification VV-0-496; 1931. Oil; Lubricating, Class D (for Internal-Combustion Engines and Other Than Aircraft and Diesel). Covers six grades designated by their S.A.E. (Society of Automotive Engineers) viscosity numbers from 20 to 70. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification VV-O-511; 1934. Oil; Lubricating, Diesel Engine. Covers five grades, designated by numbers 20, 30, 40, 50, and 55. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 14-O-13a; 1944. Oil; Lubricating, Diesel-Engine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-104B; 1943. Oil; Engine.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0; auto engine crank-case oil, *see* 504.34.

504.24 Valve Oils

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-912-41; 1941. Triple Valve Oil. Covers oil for lubricating triple valves, service and emergency portion pistons, and all other pistons in the air brake equipment having bronze packing rings. Gives properties and tests, apparatus, procedure, packing, marking, rejection, and rehearing.

504.3 MACHINE OILS

504.31 Oils for Dynamos, Spindles, Pumps, Etc.

U. S. Gov., Federal Specification VV-O-581; 1934. Oil; Lubricating, Refrigerating-Machine. Suitable for the lubrication of the cylinders of refrigerating machines. Covers five grades—8, 10, 20, 30, and 40. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0.

504.32 Machine-Gun Oil

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-27E; 1941. Oil; Lubricating, for Aircraft Instruments and Machine Guns.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0.

504.33 Recoil and Recuperator Oils for Guns

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-36D; 1941. Oil; Recoil.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-77; 1930. Recoil Oil for Aircraft Machine Guns.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-96A; 1941. Oil; Recoil, Heavy.

References.—Definitions, methods of sampling, and of testing, *see* 502.2, 503.0, 504.0; recuperator grease, *see* 504.49.

504.34 Transmission and Crankcase Oil for Automobiles

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE Recommended Practice Crankcase Oil Classification. Revised, 1941. Covers viscosity number, viscosity range, general information, viscosity temperature charts, method for estimating viscosity, and temperatures for recommending crankcase oils.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE Recommended Practice Transmission and Axle Lubricant Classification. Revised, 1940. Covers viscosity number, viscosity range, consistency, general information, viscosity, channeling, stability and oxidization resistance, solid matter, foaming, chemical activity, and corrosion and wear.

References.— Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0; engine oil for internal combustion engines, *see* 504.23.

504.35 Typewriter, Sewing Machine, and Clock Oils

National Assn. of Hosiery Manufacturers. Standard Stainless Lubricant for Knitting Machine, Mar. 1931. Specification for a stainless mineral oil for lubricating knitting and other machines used for the manufacturing of hosiery.

U. S. Gov., Federal Specification VV-O-836; 1942. Oil; Typewriter. Covers one grade of a well-refined, straight-run petroleum distillate. Suitable for lubrication of typewriters and similar mechanical devices and machines. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-47A; 1944. Oil; Clock and Watch.

504.36 Oil for Door Closers and Door Checks

References.— Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0.

504.37 Hydraulic Oil

U. S. Gov., Army Air Forces. Specification 3586C; 1942. Fluid; Hydraulic (Castor Oil Base)

U. S. Gov., Army-Navy Aeronautical Specification AN-VV-O-366b-2; 1944. Oil; Hydraulic, Petroleum Base.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-79A; 1941. Oil; Hydraulic.

504.4 LUBRICATING GREASES

504.40 General Items

American Leather Chemists Assn. Methods of Sampling and Analysis. Hard Greases, 1938. Gives requirements for melting point, titer test, unsaponifiable, free fatty acids.

American Society for Testing Materials, D 128-40; 1940. American Petroleum Institute Standard, 501-40. American Standards Assn., Z11.16-1940. Methods of Analysis of Grease. For the determination of fillers, ash, soap bases, soap, fat, water, excess alkali or acid, petroleum products, and unsaponifiable matter. Method of sampling, reagents, two methods of procedure, apparatus, calculations, and report.

American Society for Testing Materials, D 566-42; 1942. American Petroleum Institute Standard, 543-42. American Standards Assn., Z 11.51-1943. Method of Test for Dropping Point of Lubricating Grease. Gives definition, requirements for apparatus, procedure, and reproducibility of results.

American Society for Testing Materials, D 666-44; 1944. American Petroleum Institute Standard, 548-44. American Standards Assn., Z11.53; 1944. Method for Conversion of Kinematic Viscosity to Saybolt Furol Viscosity. Provides a means for converting kinematic viscosity in centistokes at 122° F. to Saybolt Furol viscosity in seconds at 122° F.

Anti-Friction Bearing Manufacturers Assn., Inc. Recommended by Annular Bearing Engineers Committee and National Lubricating Grease Instutute. (1) Tentative method for determination of low temperature torque characteristics of greases in antifriction bearings, (2) S.O.D. pressure-viscosimeter, (3) S.O.D. pressure-viscosimeter for low temperatures, (4) the measurement of low temperatures by thermal electric procedures.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Grease; Mineral, Lubricating. Covers definition, manufacture and types of greases, uses, properties, packing, and specifications.

National Lubricating Grease Institute. Revised Norma—Hoffmann Oxidation Test for Greases, 1944. This method of test describes a procedure for determining the resistance to oxidation of lubricating greases when stored under static conditions for long periods of time; for example, when coated in thin films on antifriction bearings, on motor parts, or the like. Gives apparatus, describes procedure, and appendix covers precautions and oxidation storage test.

National Lubricating Grease Institute. Tentative Method for Determination of Performance Characteristics of Lubricating Grease in Anti-Friction Bearings at Elevated Temperatures, 1944. Covers the procedure to be used for evaluating the performance characteristics of lubricating grease in antifriction bearings intended for use at temperatures above 175° F. Gives apparatus, preparation of test bearing, assembly of bearings in test spindle, procedure A, procedure B, spindle disassembly, examination of bearings after disassembly, report form, significance and limitations of the high temperature performance test, and drawings.

504.41 Cup Greases

U. S. Gov., Federal Specification VV-G-681; 1934. Grease; Lubricating, Mineral. Suitable for lubrication of such parts of motor equipment and other machinery as are lubricated by means of compression cups and for use in roller and ball bearings. Covers three grades—soft, medium, and hard. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 504.0.

504.42 Cylinder Greases

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-914-42; 1942. Brake Cylinder Lubricant. Covers grease suitable for lubricating brake cylinder packing cups. Gives requirements for general properties and tests, physical properties and tests, packing and marking, rejection, and rehearing.

504.43 Gear, Chain, and Wire Rope Greases

American Mining Congress, Sponsor. Approved by American Standards Assn. as M11-1927. Wire Ropes for Mines. Includes lubrication and lubricant for wire ropes, recommendations as to general quality of lubricant.

U. S. Gov., Federal Specification VV-L-751; 1934. Lubricant; Chain and Wire-Rope. Covers one grade—suitable for the lubrication and protection of all heavy equipment. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 14L4; 1936. Lubricant; Gear.

U. S. Gov., U. S. Army, Army Air Forces. Specification 2-98; 1937. Lubricant; Gear, Retractable Landing Gear Mechanism.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-105A; 1944. Lubricant; Gear, Universal, Hypoid and Other Types.

References.— Definitions, methods of sampling and of testing, *see* 504.0; liquid lubricant for gear, chain, and wire rope, *see* 504.19.

504.44 Graphite Greases

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-913-41; 1941. Triple Valve Graphite. Covers graphite suitable for lubricating slide valves and graduating valves of triple valves and other air brake valves. Gives graphitic carbon, ash, free iron, fineness, determination of ash, free iron and fineness, packing, marking, rejection, and rehearing.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-6—2; 1944. Grease; Lubricating, Graphite.

U. S. Gov., Federal Specification VV-G-671a; 1934. Amendment 1; 1942. Grease; Lubricating, Graphite. Covers three grades—soft, medium, and hard. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 476; 1941. Graphite; Lubricating, Amorphous. Shall be of the natural or artificial variety, free from flake graphite, powdered coal, lampblack, carbon black, grit, oil, grease, or other deleterious material. Gives requirements for graphitic carbon, volatile carbon, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.— Definitions, methods of sampling and of testing, *see* 504.0.

504.46 Crank-Pin, Driving-Journal, and Rod-Cup Greases

U. S. Gov., Federal Specification VV-G-651; 1934. Grease; Lubricating, Crank-Pin and Rod-Cup. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification VV-G-661; 1934. Grease; Lubricating, Driving-Journal. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 504.0.

504.49 Miscellaneous Lubricating Greases

U. S. Gov., Army Air Forces. Specification 3560-F; 1945. Grease; High-Melting Point (Medium Grade).

U. S. Gov., Army-Navy Aeronautical Specification AN-G-3a-2; 1944. Grease; Low-Temperature, Lubricating.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-4-3; 1944. Grease; Aluminum Soap.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-5a; 1944. Grease; High-Temperature, Lubricating.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-10-2; 1944. Grease; Extreme Pressure, Low-Temperature, Lubricating.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-14; 1943. Grease; Gasoline and Oil-Resistant.

U. S. Gov., Navy Dept. Specification 14G7; 1944. Grease; Wool, Rope-Lubricant.

U. S. Gov., Navy Dept. Specification 14G11; 1942. Grease; Lubricating, Mineral.

U. S. Gov., Navy Dept. Specification 14L3b; 1936. Lubricant; Ball-and Roller-Bearing.

U. S. Gov., Navy Dept. Specification 14L5; 1936. Lubricant; Waterproof.

U. S. Gov., Navy Dept. Specification 14L6; 1939. Lubricant for Plug-Type Scupper Valves.

U. S. Gov., U. S. Army, Medical Dept. Specification 2-101; 1939. Grease; Lubricating, for Engine Handpieces, Dental.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-39C; 1924. Grease for Recoil Mechanisms.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-106; 1942. Grease; General Purpose, No. 0.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-107; 1942. Grease; General Purpose, No. 1.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-108; 1942. Grease; General Purpose, No. 2.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-109; 1942. Grease; Water Pump.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-110; 1942. Grease; Wheel-Bearing, Heavy Duty.

References.—Definitions, methods of sampling and of testing, *see* 504.0.

504.5 PARAFFIN, PARAFFIN OIL, AND PARAFFIN WAX

504.50 General Items

American Society for Testing Materials, D721-44; 1944. American Petroleum Institute Standard, 546-44. American Standards Assn., Z11.52-1944. Method of Test for Oil Content of Paraffin Wax. For the determination of the percentage of oil in paraffin wax having a melting point of 105° F. or higher and containing not more than 15 percent by weight of oil. Gives requirements for nature of test, apparatus, solvent, procedure, calculation, and reproducibility of results.

Natural Gasoline Assn. of America. Standard Table of Physical Constants for Paraffin Hydrocarbons.

504.51 Candles

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-77-S. Candle; Smoke Chaser's Lantern (Plumber).

U. S. Gov., Federal Specification C-C-91; 1933. Candles. Covers two types—(I) stearic acid and (II) stearic acid and paraffin; and three classes for the latter type—(A) five per pound, (B) six per pound, and (C) ten per pound. Gives general and detailed requirements, properties and dimensions for both types; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

504.52 Illuminating Wax

504.53 Paraffin Oils

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Chlorinated Paraffin (Chlorocosane). Gives chemical composition, description, miscibility, specific gravity, identification, ash, acids or alkalies, free chlorine, chloride, completeness of chlorination, and storage.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-127A; 1940. Paraffin; Chlorinated.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1114A; 1944. Paraffin; Refined for Histological, Pharmaceutical, and Dental Use.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0; petrolatum, *see* 504.6.

504.54 Paraffin Wax

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Paraffin. Gives chemical composition, description, solubility, identifications, melting point, carbonizable substances, reaction, and storage.

American Society for Testing Materials, D 87-42; 1942. American Petroleum Institute Standard, 513-42. American Standards Assn., Z11.4-1942. Method of Test for Melting Point of Paraffin Wax. Definition of A. S.T.M. paraffin wax melting point, dimensions and design of test apparatus, and outline of test.

American Society for Testing Materials, D 612-43; 1943. American Petroleum Institute Standard, 544-43. American Standards Assn., Z 11.50-1943. Method of Test for Carbonizable Substances in Paraffin Wax. Applicable to paraffin wax to ascertain whether it conforms to the standard of quality required for pharmaceutical use. Gives requirements for apparatus, reagents, procedure, and interpretation of results.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Paraffin Wax. Covers definition, derivation, constants, solubility, grades, uses, containers and shipping, and substitutes.

New York Produce Exchange. Vegetable Oils, Waxes, and Fats, 1924. Paraffin Wax. White crude wax sold on basis of 2 percent oil and moisture content; yellow crude wax sold on basis of 4 percent oil and moisture content; and refined paraffin wax sold on basis of melting point.

Toilet Goods Assn., Inc. Specification No. 7; 1941. Petroleum Wax; Crystalline. Gives requirements for color, odor, fracture, solubility, melting point, melting range, carbonizable impurities, free acids and alkalis, sulfur and sulfides, ash, arsenic, and lead.

Toilet Goods Assn., Inc. Specification No.8; 1941. Petroleum Wax; Amorphous. Gives requirements for color, odor, fracture, solubility, melting point, melting range, free acids and alkalis, sulfur and sulfides, ash, arsenic, and lead.

U. S. Gov., Federal Specification VV-P-121; 1942. Wax; Paraffin. Covers three types—(I) fully refined, (II) semirefined, and (III) white crude scale. Gives requirements for melting point, color, odor, taste, oil, and moisture; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-W-141; 1942. Wax; Carnauba. Covers two grades—(1) yellow-green and (2) commercial "No.3 North Country." Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-127B; 1943. Paraffin; Chlorinated.

References.—Definitions, methods of sampling and of testing, *see* 504.0.

504.6 PETROLATUM

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Liquid Petrolatum with Phenolphthalein. Gives chemical composition, storage, alcohol content, preparation, and average dose.

American Society for Testing Materials, D 127-30; 1930. American Petroleum Institute Standard, 523-30. American Standards Assn., Z11.22-1932. Method of Test for Melting Point of Petrolatum. Describes apparatus and test procedure for determination of the melting point temperature at which petrolatum is sufficiently fluid to drop from the thermometer under prescribed conditions.

American Society for Testing Materials, D 155-39 T; 1939. Tentative Method of Test for Color of Lubricating Oil and Petrolatum by Means of A.S.T.M. Union Colorimeter. Gives description of special colorimeter, lists glass color standards and procedures for light and for dark lubricating oils and petrolatum.

American Society for Testing Materials, D565-43; 1943. American Petroleum Institute Standard, 545-43. American Standards Assn., Z11.49-1943. Method of Test for Carbonizable Substances in White Mineral Oil (Liquid Petrolatum). Test for conformity to standard of quality required for pharmaceutical use. Gives apparatus, reagents, procedure, and interpretation of results.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 77-41; 1942. Insulating Compound for Use in Impedance Bonds. Includes requirements for material and workmanship, physical characteristics, inspection, tests, packing, marking, and warranty.

Toilet Goods Assn., Inc. Specification No. 6; 1941. Petrolatum. Gives requirements for color, odor, taste, solubility, viscosity, melting point, specific gravity, ash, saponifiable matter, free acids and alkalis, sulfur and sulfides, arsenic, and lead.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Light Liquid Petrolatum (Light Liquid Paraffin, Light White Mineral Oil). Viscosity, specific gravity and other tests, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Liquid Petrolatum (Liquid Paraffin, White Mineral Oil, Heavy Liquid Petrolatum). Description, solubility, specific gravity, viscosity, carbonizable substances, reaction, solid paraffin, sulfur compounds, and storage. U.S. P. product of liquid petrolatum-Emulsum Petrolati Liquidi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Petrolatum (Petroleum Jelly). Description, solubility, specific gravity, melting point, ash, organic acids, alkali, mineral acids, fixed oils, fats or rosin, consistency, color, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. White Petrolatum (White Petroleum Jelly). Description, color, other tests, and storage.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-51-1; 1944. Petrolatum.

U. S. Gov., Navy Dept. Specification 14P1c; 1934. Petrolatum.

U. S. Gov., Treasury Dept., Procurement Div., 479A; 1943. Petrolatum; Technical Grade. Shall be in one type and in one grade. Gives requirements for melting point, flash point, penetration, evaporation loss, neutralization number, precipitation number, odor, corrosion, reaction, and abrasion; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-67A; 1940. Petrolatum (for Lubrication of Ordnance Materiel).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-34A; 1938. Petroleum Jelly, for Use in Smokeless Powder.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-37A; 1938. Grease; Shell.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0; liquid petrolatum, *see* 504.53.

504.7 CUTTING OILS

U. S. Gov., Federal Specification VV-O-251; 1934. Oil; Cutting, Mineral-Lard. Covers two grades—1 and 2; suitable as a cutting oil and coolant for machine cutting tools. Gives Detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification VV-O-261; 1934. Amendment 1; 1934. Oil; Cutting, Soluble. Covers one grade, suitable for use as a coolant and lubricant for cutting and threading tools. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 14011a; 1939. Oil; Cutting, Mineral-Lard, Sulfur-Treated.

U. S. Gov., Treasury Dept., Procurement Div., No. 469; 1941. Oil; Cutting, Mineral-Lard, Sulfur-Treated. Covers a clean and homogeneous solution of well refined oil; shall not deposit gum on machinery or parts with use, nor shall separation of fatty or mineral oils occur at working temperatures. Gives requirements for color, specific gravity, water, flash point, pour point, viscosity, saponifiable oil content, neutralization number, and sulfur; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Definitions, methods of sampling and of testing for lubricating oils, *see* 504.0; definitions, methods of sampling and of testing for animal oils and fats, *see* 040; other lard oils, *see* 041.3.

504.8 TRANSFORMER AND SWITCH INSULATING OILS

American Society for Testing Materials, D 94-44; 1944. American Petroleum Institute Standard, 547-44. American Standards Assn., Z11.20-1944. Method of Test for Saponification Number of Petroleum Products by Color-Indicator Titration. The method is applicable to new and used petroleum oils including electrical insulating oils and to mixtures of fats and mineral oils. Gives definition, principle of method, apparatus, reagents, blank determinations, sample, procedure, calculation, identification of fat, and reproducibility of results.

American Society for Testing Materials, D117-43; 1943. American Standards Assn., C 59.2-1944. Methods of Testing Electrical Insulating Oils. Apply to oils for use in transformers, oil circuit-breakers, and similar apparatus as an insulating or cooling medium. Gives requirements for sampling, specific gravity, color, viscosity, flash point, pour point, neutralization number, saponification number, sludge, mineral acids, free and corrosive sulfur, steam emulsification test, dielectric strength, and report.

American Society for Testing Materials, D 670-42 T; 1942. Tentative Methods of Test for Sludge Formation in Mineral Transformer Oil. Applicable in the evaluation of the sludge forming tendency in new mineral transformer oils.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 46-41; 1942. Transformer Oil. Includes requirements for color, flash, fire, pour point, viscosity, acidity, alkali, water, free sulphur and chlorides, dielectric strength, inspection, tests according to current methods of American Society for Testing Materials, packing, marking, and warranty.

U. S. Gov., Federal Specification VV-O-401; 1942. Oil; Insulating (for Transformers, Switches, and Circuit Breakers). Covers one grade. Gives requirements for physical and chemical characteristics; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 14-O-12b; 1943. Oil; Transformer.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 503.0, 504.0.

504.9 MISCELLANEOUS OILS

American Society for Testing Materials, D 665-44 T; 1944. Tentative Method of Test for Rust-Preventing Characteristics of Steam-Turbine Oil in the Presence of Water. Intended to indicate the ability of steam-turbine oils, including those used for steam-turbine gears, to aid in preventing the rusting of ferrous parts should water become admixed with the oil.

National Assn. of Wool Manufacturers. Specification P-1; 1941. Refined Mineral Oil. Gives requirements for flash point, viscosity at 100° F., pour, color, neutralization number, saponification number, evaporation loss, and light stability.

Society of Automotive Engineers. Aeronautical Material Specification No. 3070; 1942. Oil Corrosion Preventive (Carburetor Slushing). A refined petroleum oil suitable for protecting the interior of carburetors from corrosion during shipment and storage. Includes requirements for quality, physical properties, tests, reports, identification, approval, and rejections. Similar to U. S. Gov., Navy Dept., Bureau of Aeronautics Specification AN-VV-O-446, grade 1065A.

U. S. Gov., Army Air Forces. Specification 3604; 1944. Oil; Corrosion-Preventive, Soluble.

U. S. Gov., Army Air Forces. Specification 3605; 1944. Oil; Preservative, for Hydraulic Equipment.

U. S. Gov., Federal Specification P-O-361; 1938. Oil; Floor, Mineral. Covers one type and one grade. Gives requirements for viscosity, flash point, color, pour point, and saponification number; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Castor oil for medicinal purposes, *see* 813.1; cottonseed oil, *see* 142.4.

505. ASPHALT AND OTHER BITUMINOUS MATERIALS

505.0 GENERAL ITEMS

American Assn. of State Highway Officials, T41-35. Standard Method of Sampling Bituminous Mixtures. In selecting samples of bituminous paving mixtures the most applicable method should be used. Gives details for sampling at place of manufacture and for sampling at point of delivery.

American Assn. of State Highway Officials, T43-35. Standard Method of Test for Specific Gravity of Bituminous Materials. The specific gravity of bituminous materials shall be expressed preferably at the ratio of the weight of a given volume of the material at 25° C. (77° F.) Gives details for hydrometer method used for thin fluid bitumens, pycnometer method used for viscous fluid and semisolid bitumens and emulsions, displacement method used for semisolids, and displacement method used for hard, solid bitumens.

American Assn. of State Highway Officials, T44-42. Standard Method of Test for Determination of Bitumen. Gives scope, apparatus, preparation of sample, preparation of crucible, and procedure for method No. 1 and method No. 2.

American Assn. of State Highway Officials, T46-35. Standard Method of Test for Percentage of Bitumen Insoluble in Paraffin Naphtha. Gives details for method of procedure.

American Assn. of State Highway Officials, T54-35. Standard Method of Test for Specific Viscosity (Engler). The viscosity of fluid bituminous road materials may be determined at any suitable temperature by means of the Engler viscosimeter. Gives details for this process.

American Assn. of State Highway Officials, T58-37. Standard Methods of the Determination of the Percentage of Bitumen in Bituminous Mixtures. Gives detailed procedure for centrifugal method and for method for examination of bituminous mortars and sheet asphalt.

American Assn. of State Highway Officials, T77-38. Standard Method of Sampling and Testing Premolded Asphalt Plank. Gives sampling, inspection, absorption test, brittleness test, indentation test, and mineral surfacing test.

American Assn. of State Highway Officials, T101-42. Standard Methods of Determining Swell Characteristics of Aggregates When Mixed With Bituminous Materials. These methods provide for the determination of the swell characteristics of dense-graded bituminous mixtures and aggregates used in such mixtures. Gives apparatus, bituminous binder, procedure, measuring, immersion, calculation of results, and report.

American Assn. of State Highway Officials, T102-42. Standard Method of Spot Test of Asphaltic Materials. This method is applicable only to asphaltic products derived from petroleum and should not be applied to natural asphalts containing nonbituminous matter insoluble in xylene. Gives materials, apparatus, samples, procedure, procedure in disputed cases, and xylene equivalents.

American Assn. of State Highway Officials, T109-42. Standard Method of Test for Settlement Ratio of Mineral Matter in Bituminous Filler. This method of test is used as a measure of the rate at which mineral matter in mixtures of asphalt and mineral matter will settle when maintained without agitation at a temperature of 325° F. Gives apparatus, sample, procedure, and results.

American Assn. of State Highway Officials, T110-42. Standard Method for Determination of Moisture or Volatile Distillates in Bituminous Mixtures. This method may be used for determination by direct measurement of moisture or volatile fractions of the bitumen in bituminous mixtures. Gives apparatus, samples, and procedure.

American Assn. of State Highway Officials, T111-42. Standard Method of Test for Inorganic Matter or Ash. Intended for the determination of mineral matter in solid, semisolid, or liquid bitumens. Gives apparatus, preparation of sample, procedure, and calculations.

American Society for Testing Materials, D4-42; 1942. American Standards Assn., A 37.3-1943. Method of Test for Determination of Bitumen. Intended for the determination of bitumen in materials containing at least 25 percent bitumen. Covers apparatus, preparation of sample, preparation of Gooch crucible, methods of procedure, calculation, and report.

American Society for Testing Materials, D 5-25; 1925. American Assn. of State Highway Officials, T 49-42. American Standards Assn., A37.1-1930. Method of Test for Penetration of Bituminous Materials. Dimensions and construction of container and needle, water bath standard temperature, preparation of sample, test procedure.

American Society for Testing Materials, D 6-39 T; 1939. American Assn. of State Highway Officials, T 47-42. Tentative Method of Test for Loss on Heating of Oil and Asphaltic Compounds. For loss of weight (exclusive of water) when heated in special apparatus described, preparation of sample, and method of procedure.

American Society for Testing Materials, D 8-33; 1933. Definitions of Terms Relating to Materials for Roads and Pavements. Covers bituminous materials such as emulsion, cut-back, asphalts, coal tar and pitch, terms relating to tests, nonbituminous materials, etc.

American Society for Testing Materials, D 36-26; 1926. American Standards Assn., A 37.10-1943. American Assn. of State Highway Officials, T 53-42. Method of Test for Softening Point of Bituminous Materials (Ring-and-Ball Method). Gives dimensions and design of ring, steel ball, container, and thermometer; method of preparing sample, rate of heating, permissible variations, modifications for hard materials, and precautions to be observed.

American Society for Testing Materials, D 61-38; 1938. Method of Test for Softening point of Tar Products (Cube-in-Water Method). For arbitrary method applicable to pitches softening under 176° F., including hard and soft pitches, description of apparatus, preparation of sample, and test methods.

American Soceity for Testing Materials, D 70-27; 1927. Method of Test for Specific Gravity of Road Oils, Road Tars, Asphalt Cements, and Soft Tar Pitches. Requirements for pycnometer or weighing bottle, size and weight, and ratio of weight of fluid to that of distilled water, with precautions to be observed.

American Society for Testing Materials, D 71-27; 1927. Method of Test for Specific Gravity of Asphalts and Tar Pitches Sufficiently Solid To Be Handled in Fragments. For determination by use of an analytical balance equipped with a pan straddle or other stationary support. Preparation of test specimen and method of procedure.

American Society for Testing Materials, D 92-33; 1933. American Assn. of State Highway Officials, T 48-42. American Petroleum Institute Standard, API 511-33. American Standards Assn., Z11.6-1933. Method of Test for Flash and Fire Points by Means of Open Cup. For all petroleum products except fuel oils and those having an open cup flash below 175° F. Includes description of Cleveland open cup, heating plate, and procedure for flash and fire points.

American Society for Testing Materials, D 95-40; 1940. American Petroleum Institute Standard, 519-40. American Assn. of State Highway Officials, T 55-42. American Standards Assn., Z11.9-1940. Method of Test for Water in Petroleum Products and Other Bituminous Materials. Especially applicable to petroleum, fuel oil, road oil, coal tar, water-gas and coke oven tars, etc. Determination of water by distilling sample with volatile solvent, dimensions and design of still, distillation requirements for solvents, test procedure.

American Society for Testing Materials, D 113-44; 1944. American Assn. of State Highway Officials, T 51-44. American Standards Assn., A 37.11; 1944. Method of Test for Ductility of Bituminous Materials. For measurement of elongation before rupture at standard temperature and specified speed; gives requirements for apparatus, molding test specimen, and tensile test method.

American Society for Testing Materials, D139-27; 1927. American Assn. of State Highway Officials, T 50-42. American Standards Assn., A37.2-1930. Method of Float Test for Bituminous Materials. Weight and dimensions of aluminum float and brass collar, assembly of apparatus, design and graduation of thermometer, preparation of sample, and test procedure for asphalt products and for tar products.

American Society for Testing Materials, D 140-41T; 1941. American Assn. of State Highway Officials, T 40-42. Tentative Methods of Sampling Bituminous Materials. Samples may be taken either (a) to represent as nearly as possible an average of the bulk of the material sampled or (b) to ascertain the maximum variation in characteristics which the material may possess. Protection and preservation, time and place, sizes of samples, containers; sampling under pressure, under gravity flow, from tank cars, barrels, drums, and cakes for solid, semisolid, and liquid materials, and for crushed fragments.

American Society for Testing Materials, D 147-41; 1941. Methods of Testing Bituminous Mastics, Grouts, and Like Mixtures. Definitions of bituminous grout, asphalt mastic, and asphalt mastic cake; preparation of samples, description of extraction apparatus for small and for large samples, test procedures for analysis of 10 to 30 gm. and 50 to 500 gm. samples, recovery and examination of extract bitumen, and solubility of aggregate in hydrochloric acid. A.S.T.M. Emergency Alternate Provision, EA-D 147; 1941, affected section 3, apparatus.

American Society for Testing Materials, D165-42; 1942. American Assn. of State Highway Officials, T 45-42. American Standards Assn., A 37.12; 1943. Method of Test for Proportion of Bitumen Soluble in Carbon Tetrachloride. Covers apparatus required, preparation of sample, outline of procedure, and calculation of percentage.

American Society for Testing Materials, D243-36; 1936. American Assn. of State Highway Officials, T 56-42. American Standards Assn., A 37.13-1943. Method of Test for Residue of Specified Penetration. Applies to specified penetration of residue obtained by heating road oil or semisolid asphalt at 249° to 260° C. Describes apparatus necessary, sample, procedure, precautions, and reproducibility of results.

American Society for Testing Materials, D 244-42; 1942. American Assn. of State Highway Officials, T 59-42. Methods of Testing Emulsified Asphalt. For examination of emulsions composed principally of a semisolid or liquid asphaltic base, water, and emulsifying agent. Requirements for determination of viscosity, distillation test, determination of water, settlement, demulsibility, sieve test, coating test, freezing test, penetration of residue, solubility of residue, ductility of residue, specific gravity, and ash in residue.

American Society for Testing Materials, D 255-28; 1928. Method of Test for Steam Distillation of Bituminous Protective Coatings. General method for the separation and recovery of the solvent and base in bituminous mixtures, description and assembly of apparatus, and outline of procedure.

American Society for Testing Materials, D 270-33; 1933. American Petroleum Institute Standard, 528-33. American Standards Assn., Z11.33-1935. Methods of Sampling Petroleum and Petroleum Products. Includes all petroleum products except gases. Requirements for experienced personnel and description of apparatus; for bottle or beaker sampling of tank cars and trucks; and shore, ship, or barge tanks; continuous sampling of pipe lines, dipper sampling of streams; thief sampling of cans, drums, and tank cars; borings sampling of wax, soft solids in cases, cakes, bags, or barrels; and grab sampling of lumpy material in bins, bunkers, sacks, and barrels.

American Society for Testing Materials, D 313-41; 1941. Method of Test for Coarse Particles in Mixtures of Asphalt and Mineral Matter. Covers the procedure for determining the amount of particles of mineral or other insoluble matter in asphaltic mixtures that are retained upon a No. 200 (74-micron) sieve. Sampling, preparation of sample, apparatus, procedure, and calculation.

American Society for Testing Materials, D 446-39; 1939. American Petroleum Institute Standard, 534-39. American Standards Assn., Z11.46-1941. Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity. Includes table of values and equation for converting kinematic viscosity in centistokes at any temperature to Saybolt viscosity in seconds at the same temperature.

American Society for Testing Materials, D 529-39T; 1939. Tentative Recommended Practice for Accelerated Weathering Test of Bituminous Materials. For simulating extreme outdoor exposure, description of apparatus, intensity of light, temperature control, refrigeration temperature, test specimen, cycles for cold, water, light exposure, and determination of extent of weathering.

American Society for Testing Materials, D 567-41; 1941. American Petroleum Institute Standard, 540-41. American Standards Assn., Z11.45-1941. Method for Calculating Viscosity Index. Provides a means for calculating the viscosity index of a petroleum product or lubricant from its viscosity at 100° and 210° F. Gives definition, formulas and tables, calculation, reproducibility, and tables showing values.

American Society for Testing Materials, D 762-44 T; 1944. Tentative Method of Test for Hot Extraction of Asphaltic Materials and Recovery of Bitumen by the Modified Abson Procedure. Covers the procedure for the extraction of benzol soluble bitumen from asphaltic mixtures, the removal of mineral matter from the solution, and the recovery of the bitumen from solution in sufficient quantity for further testing. Gives apparatus, reagents, sample, and procedure.

American Society for Testing Materials, E 28-42 T; 942. Tentative Method of Test for Softening Point Ball and Shouldered Ring Apparatus). Applicable to asphalts, tars, pitches, rosins, and most resins, both natural and synthetic. Apparatus, preparation of sample, procedure, softening point, precautions, and reproducibility of results.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Flash Point Test-Pensky-Martens Closed Cup Tester. For determining the flash point of fuel oils, cut-back asphalts, and other viscous materials, and suspensions of solids. Describes apparatus, procedure, flash point, barometric pressure, and reproducibility of results.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R4-36; 1936. Asphalt. This recommendation establishes grades of asphalt for paving purposes as determined by penetration limits. It defines the range of asphalt used in the construction of sheet asphalt, asphaltic concrete, asphalt-macadam pavements, surface treatment, and for joint filler or for preparation of joint filler for various types of construction. Initiated by the Asphalt Institute.

505.1 ASPHALTS

505.10 General Items

505.11 Native Asphalt

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Gilsonite. Covers definition, constants, solubility, derivation, grades, uses, substitutes, and shipping.

U. S. Gov., Federal Specification SS-A-706a; 1940. Asphalt(for Use in) Road and Pavement Construction. Covers 24 grades and types. Gives requirements for physical and chemical properties; methods for sampling and testing; and requirements for packing and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-74; 1939. Asphaltum, Gilsonite.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0.

505.12 Asphalt, Pavement

References.—Asphalt pavements, *see* 518.37.

505.13 Asphalt Cement

American Assn. of State Highway Officials, M20-42. Standard Specifications for Asphalt Cement (prepared from petroleum). For penetration grades 30-40, 40-50, 50-60, 60-70, 70-85, 85-100, 100-120, 120-150, 150-200. Gives scope, general requirements, properties and tests, and methods of sampling and testing.

American Assn. of State Highway Officials, M22-42. Standard Specifications for Asphalt Cement (prepared from Trinidad Lake asphalt). For penetration grades 30-40, 40-50, 50-60, 60-70, 70-85, 85-100, 100-120, 120-150, 150-200. Gives scope, general requirements, properties and tests, methods of sampling and testing, and table showing physical properties of various grades.

American Public Works Assn. Specification for Pavement Foundation of Asphaltic Concrete, B-5; 1936. Includes asphalt cement requirements for homogenous, water-free, nonfoaming mixture; specific gravity, flash point, penetration, ductility, loss on heating, bitumen soluble in carbon tetrachloride, sampling, and tests using A.S.T.M. methods.

American Public Works Assn. Specification for Sheet Asphalt Pavement, G1-36; 1936. Includes asphalt cement requirements; for homogeneous, water free, nonfoaming mixture; penetration, ductility, loss on heating, flash point, and bitumen soluble in carbon tetrachloride, with tests in accordance with A.S.T.M. methods.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Asphalt Mastic Floors and Asphalt Block Floors. Gives requirements for asphaltic cement.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Sheet Asphalt Pavements; Asphalt Block Pavements; and Asphalt Macadam Pavements. Gives requirements for asphaltic cement.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Membrane Waterproofing. Gives requirements for plastic cement.

Asphalt Institute. Construction Series 64; 1942. Asphalt Cements. Shall be prepared by the refining of petroleum, and no mineral filler other than that naturally contained in the asphalt shall be present. Includes flash point, penetration of original sample, loss on heating, penetration after loss on heating, ductility, and solubility in carbon tetrachloride.

U. S. Gov., Federal Specification SS-C-153; 1933. Cement; Bituminous, Plastic. Covers two types—(I) asphaltic base and (II) coal-tar base. Composed of an inorganic filler, a solvent, and a nonvolatile bituminous binder. Gives requirements for material and physical properties; methods of sampling and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.276; 1938. Cement; Bituminous, Plastic, Special-Asphaltic-Base (for Vertical Surfaces). Shall be one type and grade, composed of a suitable inorganic filler, a suitable solvent, and a nonvolatile bituminous binder. The binder shall be mainly asphaltic. Gives requirements for nonvolatile matter, inorganic filler, workability, heat and cold test, joint test, and strain test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 278; 1938. Cement; Bituminous, Plastic Vegetable-Oil-Pitch-Base. Covers one type and one grade. Cement shall be composed of a suitable inorganic filler, suitable solvent, and a nonvolatile bituminous binder. The binder shall be mainly a vegetable-oil-pitch. Intended for use in repairs of roofs, walls, and foundations and as an expansion joint and caulking material. Gives requirements for nonvolatile matter, inorganic filler, workability, heat and cold test, joint test, strain test, and bleeding test; methods of sampling, inspection, and tests; and packaging and marking.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0.

505.14 Oil Asphalt

American Assn. of State Highway Officials, M81-42. Standard Specifications for Cut-Back Asphalt. Covers liquid petroleum products, produced by flushing an asphaltic base with suitable light volatile solvent, to be used in the treatment of road surfaces. Gives general requirements, properties and tests, methods of sampling and testing, and table showing physical requirements for various grades.

American Assn. of State Highway Officials, M82-42. Standard Specifications for Cut-Back Asphalt. Covers liquid petroleum products, produced by flushing an asphaltic base with suitable distillates, to be used in the treatment of road surfaces. Gives general requirements, properties and tests, methods of sampling and testing, and table showing physical requirements for various grades.

American Public Works Assn. Specification for Modified Asphalt Macadam Pavement, G7-36; 1936. Cutback asphalt requirements as to Furol viscosity, distillation range, ductility of residue, penetration, bitumen soluble in carbon disulfide; using A.S.T.M. methods of test.

American Society for Testing Materials, D41-41; 1941. American Assn. of State Highway Officials, M116-42. Primer for Use With Asphalt in Dampproofing and Waterproofing. Cover asphaltic primer for application to concrete or masonry surfaces, for use with asphalt in dampproofing and waterproofing. Viscosity, distillation, residue penetration ranges, directions for sampling, and methods of testing.

American Society for Testing Materials, D 402-36; 1936. American Assn. of State Highway Officials, T 78-42. Method of Test for Distillation of Cut-Back Asphaltic Products. For separation of volatile and nonvolatile portions of cut-back asphalt; requirements for apparatus with details as to design and assembly, preparation of sample and dehydration, and outline of procedure.

American Society for Testing Materials, D 597-40T; 1940. Tentative Specifications for Cut-Back Asphalt (Rapid Curing Type). Covers liquid petroleum products, produced by fluxing asphalt base with volatile solvent for treatment of road surfaces. Requirements for six grades including uses, flash point, viscosity, distillation range, penetration, ductility, and gives methods of testing.

American Society for Testing Materials, D 598-40T; 1940. Tentative Specifications for Cut-Back Asphalt (Medium Curing Type). Covers liquid petroleum products, produced by fluxing an asphalt base with suitable distillates for treatment of road surfaces. Includes requirements for six grades based on uses, viscosity, flash point, distillation range, penetration, ductility, and gives tests.

U. S. Gov., Federal Specification SS-A-701; 1933. Asphalt-Primer; (for) Roofing and Waterproofing. Covers one type, of an asphaltic base thinned to suitable brushing consistency with a volatile solvent. Gives requirements for asphaltic base and solvent; methods of sampling and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-A-706b; 1943. Asphalt (for Use in) Road and Pavement Construction. Shall be asphalts prepared by the distillation of asphaltic petroleum or by the fluxing of hard native Trinidad asphalt with a suitable petroleum flux. Covers nine types of petroleum asphalt and nine types of fluxed Trinidad asphalt. Gives details for each type including specific gravity, flash point, softening point, penetration at 25° C., ductility at 25° C., loss at 163° C., bitumen (soluble in carbon disulphide), and uniformity; methods of sampling and testing; and packing and marking for shipment.

References.— Definitions, methods of sampling and of testing, *see* 502.2, 505.0; asphalt emulsion, *see* 505.19.

505.15 Asphalt and Other Bituminous Fillers

American Assn. of State Highway Officials, M18-42. Standard Specifications for Oil Asphalt Filler. Gives scope, general requirements, properties and tests, methods of sampling and testing, and table showing physical properties of grades A and B.

American Assn. of State Highway Officials, M33-42. Standard Specifications for Preformed Expansion Joint Filler for Concrete (Bituminous Type). Gives scope, general requirements, dimensions, sampling, and methods of testing.

American Assn. of State Highway Officials, M59-42. Standard Specifications for Preformed Expansion Joint Filler for Concrete (Bituminous Fiber Type). Gives scope, general requirements, dimensions, properties, sampling, and methods of testing.

American Assn. of State Highway Officials, M89-42. Standard Specifications for Mixed Asphalt and Mineral Filler. Gives scope, general requirements, mineral filler, fineness of mineral filler, properties of mixture, and methods of sampling and testing.

American Assn. of State Highway Officials, T42-42. Standard Method of Test for Preformed Expansion Joint Filler for Concrete. Gives scope, absorption, brittleness, distortion, preparation of test specimens, expansion in boiling water, recovery and compression, extrusion, boiling in hydrochloric acid, accelerated weathering tests, and weight per cubic foot.

American Public Works Assn. Specification for Vitrified Brick Pavement, D1-36. Includes requirements for asphalt filler as to specific gravity, water, foaming, flash point, melt point, penetration ductility, loss on heating, bitumen soluble in carbon disulfide and in carbon tetrachloride, tests in accordance with A.S.T.M. methods. Also includes requirements for tar or cut-back asphalt bituminous material used in preparation of mastic cushion. Adopted by National Paving Brick Assn.

American Public Works Assn. Specification for Portland Cement Concrete Pavement, F1-39; 1939. Gives requirements for premolded joint fillers consisting of cane or other fiber and asphalt, tolerances, asphalt properties, weight, absorption, brittleness, distortion, deflection, and extrusion; poured-in-place joint fillers, properties of asphalt, mastic type filler, etc.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Brick Pavements and

Floors. Gives requirements for bituminous mastic cushion and applying asphalt filler.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Creosoted Wood Block Pavements and Wood Block Floors. Gives requirements for bituminous paint coat and bituminous mastic cushion for laying blocks.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Construction of Monolithic Concrete Crossings. Gives requirements for rail fillers,— premoulded bituminous fillers and poured bituminous fillers.

American Society for Testing Materials, D 112-30; 1930. Coal-Tar Pitch for Stone Block Filler. Gives requirements for allowable water, softening point, distillation test, specific gravity, ductility, total bitumen, and applicable A.S.T.M. methods of testing.

American Society for Testing Materials, D 170-41; 1941. Bituminous Grout for Use in Waterproofing Above Ground Level. For use in protective covering of membrane waterproofing, or for bedding brick, or filling joints, or flooding surfaces of brick protective covering; also suitable for waterproofing railroad bridges, culverts, subways, etc. Properties, bituminous binder, mineral aggregate, and methods of testing.

American Society for Testing Materials, D 171-41; 1941. Bituminous Grout for Use in Waterproofing Below Ground Level. Suitable for protective covering of membrane waterproofing, or for bedding brick, or filling joints, or flooding of surface of brick protective covering; also for use in waterproofing tunnels, subways, etc. Properties, bituminous binder, mineral aggregate, and methods of testing.

American Society for Testing Materials, D 241-43; 1943. Asphalt Filler for Brick Pavements. Includes two grades based on foaming temperatures—(A) 350° F. and (B) 446° F. Gives requirements for softening point, flash point, penetration, ductility, loss on heating, bitumen soluble in carbon disulfide, and bitumen soluble in carbon tetrachloride.

American Society for Testing Materials, D 544-41; 1941. Preformed Expansion Joint Fillers for Concrete (Nonextruding and Resilient Types). Includes cork, self-expanding cork, sponge rubber, and cork rubber. Manufacture, character of strips, properties, dimensions and permissible variations, packing, sampling, and methods of testing.

American Society for Testing Materials, D 545-41; 1941. Methods of Testing Preformed Expansion Joint Fillers for Concrete (Nonextruding and Resilient Types). Procedures covering tests for expansion in boiler water, recovery, compression, extrusion, boiling in hydrochloric acid, and weathering.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R4-36; 1936. Asphalt. This recommendation establishes grades of asphalt for paving purposes as determined by penetration limits. Defines range of asphalt used in construction of sheet asphalt, asphaltic concrete, and asphalt macadam pavements, surface treatment, and for joint filler, or for preparation of joint filler for various types of construction. Initiated by the Asphalt Institute.

U. S. Gov., Federal Specification R-T-111; 1933. Tar; (for) Joint-Filler. Covers three grades—TPF-1-Y (intended use— mixed with sand as a mastic filler for joints of stone-block pavements), TPF-2-Y (intended use—filler for joints of brick and stone-block pavements), and TPF-3-Y (intended use—filler for joints of wood-block pavements). Gives requirements for composition, specific gravity, softening point, total distillate, softening point of residue, and bitumen; methods of testing for specific gravity, softening point, distillation test, and bitumen (soluble in carbon disulphide) in accordance respectively with American Society for Testing Materials Standard Methods D70-27, D36-26, D20-20, and D4-27; and requirements for packing and marking.

U. S. Gov., Federal Specification SS-A-696; 1931. Amendment 1; 1937. Asphalt; Petroleum, Type PAF-1-25 (for) Joint Filler (Squeegee or Pouring Method). Covers one grade—prepared from asphaltic petroleum. Gives requirements for chemical composition and physical properties; methods of tests; and requirements for packing and marking.

U. S. Gov., Federal Specification SS-C-153; 1933. Cement; Bituminous, Plastic. Covers two types—(I) asphaltic base and (II) coal-tar base. Composed of an inorganic filler, a solvent, and a nonvolatile bituminous binder. Gives requirements for material and physical properties; methods of sampling and testing; and requirements for packaging, packing and marking.

U. S. Gov., Federal Specification SS-F-336; 1942. Filler; Joint-Sealing, Hot-Poured Type (for Concrete). Covers one grade. Gives requirements for material and methods of testing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 4Yd; 1939. Construction of Portland Cement Concrete Pavements. Includes requirements for premolded joint material.

U. S. Gov., Treasury Dept., Procurement Div., No. 278; 1938. Cement; Bituminous, Plastic Vegetable-Oil-Pitch-Base. Covers one type and one grade. Cement shall be composed of a suitable inorganic filler, suitable solvent, and a nonvolatile bituminous binder. The binder shall be mainly a vegetable-oil-pitch. Intended for use in repairs of roofs, walls, and foundations and as an expansion joint and caulking material. Gives requirements for nonvolatile matter, inorganic filler, workability, heat and cold test, joint test, strain test, and bleeding test; methods of sampling, inspection, and tests; and packaging and marking.

References.—Definitions, methods of sampling and of testing; *see* 502.2, 505.0, 505.30; nonbituminous fillers, *see* 512.16.

505.16 Asphalt and Asphalt Felt for Roofing and Waterproofing

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for waterproofing and for dampproofing—requirements for material, fabric and joint filler (to conform with American Society for Testing Materials specification); storage of fabric, preparation of surface; application; damage patching; protection course; and measurement and payment.

American Assn. of State Highway Officials, M115-42. Standard Specifications for Asphalt for Dampproofing and Waterproofing. Gives scope, primer, types, properties, methods of sampling and testing, and table showing requirements for types A and B.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Built-Up Roofing. Gives requirements for materials (pitch, asphalt, asphalt primer, roofing felt, ready or prepared asphalt roofings, flashings, gravel, and slag); tarred rag felt, pitch and gravel (or slag) over wood or pre-cast units (type A-1), and over homogeneous roofs cast in place (type A-2); tarred rag felt, steep roofing pitch and slag, for use over wood or pre-cast concrete or gypsum units (type A-3), and over homogeneous roofs cast in place (type A-4); asphalt rag felt, asphalt and gravel (or slag) over wood or pre-cast units (type B-1), and over homogeneous roofs cast in place (type B-2); asphalt impregnated asbestos felt and asphalt (smooth surface) over wood or pre-cast units (type C-1—classes 1, 2, and 3), and over homogeneous roofs cast in place (type C-2—classes 1, 2, and 3); and asphalt rag felt and asphalt (smooth surface) over wood or precast units (type D-1), and over homogeneous roofs cast in place (type D-2).

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Slate Roofing. Gives requirements for roofing felt.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Membrane Waterproofing. Gives requirements for asphaltic primer.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Membrane Waterproofing. Gives requirements for bitumen, asphalt for mopping above ground, asphalt for mopping below ground, coal-tar pitch for saturant and mopping, creosote primer, untreated and treated fabrics, felt, insulating paper, plastic cement, asphalt mastic, premoulded asphalt blocks, materials for concrete, and application. Emergency Provisions adopted Dec. 14, 1942, waives requirements for ductility at 770° F. for the duration.

American Society for Testing Materials, D 146-44 T; 1944. Tentative Methods of Testing Felted and Woven Fabrics Saturated With Bituminous Substances for Use in Waterproofing and Roofing. Covers fabrics saturated (but not coated) with asphalt or coal-tar products for use in membrane waterproofing. Sampling, requirements of finished fabric as to area, weight, loose surfacing, moisture, strength, pliability, water absorption, loss on heating, and distillation of coal-tar saturated felt, and for desaturated fabric, weight, carbonaceous matter, total comminuted surfacing, saturant, and ash.

American Society for Testing Materials, D 170-41; 1941. Bituminous Grout for Use in Waterproofing Above Ground level. For use in protective covering of membrane waterproofing, for bedding brick, or filling joints, or flooding surfaces of brick protective covering; also suitable for waterproofing railroad bridges, culverts, subways, etc. Properties, bituminous binder, mineral aggregate, and methods of testing.

American Society for Testing Materials, D 171-41; 1941. Bituminous Grout for Use in Waterproofing Below Ground Level. Suitable for protective covering of membrane waterproofing, or for bedding brick, or filling joints, or flooding of surface of brick protective covering; also for use in waterproofing tunnels, subways, etc. Properties, bituminous binder, mineral aggregate, and methods of testing.

American Society for Testing Materials, D 173-44, 1944. American Assn. of State Highway Officials, M 117. Woven Cotton Fabrics Saturated With Bituminous Substances for Use in Waterproofing. For use in membrane system of waterproofing. Gives requirements for manufacture, properties of treated and untreated fabric, saturation, sizes, weight, strength, pliability, surface finish, sampling, and testing.

American Society for Testing Materials, D 224-44 T; 1944. Tentative Specifications for Asphalt Roofing Surfaced With Powdered Talc or Mica. Cover asphalt roofing in sheet form surfaced with finely powdered mineral matter, either 36 or 32 in. in width, composed of roofing felt saturated and coated on both sides with asphalt. Manufacture, character of felt, saturant, and coatings; physical properties, freedom from defects, pliability and stickiness, packing, nails and lap-cement, sampling and methods of testing, inspection, and basis of rejection. A.S.T.M. Emergency Alternate Provision, EA-D 224b, 1944, omits requirements for protective coating on nails, section 12a, item 2.

American Society for Testing Materials, D 225-44T; 1944. Tentative Specifications for Asphalt Shingles Surfaced With Coarse Mineral Granules. Cover asphalt roofing in shingle form surfaced with colored mineral granules, composed of roofing felt saturated and coated on both sides with asphalt and surfaced on the weather side with granulated slate or equivalent mineral material (of solid or mixed colors as may be agreed upon by the purchaser and the seller) and on the reverse side with powdered talc or mica. Intended to be used with a "headlap" of not less than 2 in. Individual (American Method), Square Tab Strip, and Hexagonal Tab Strip. Manufacture, character of felt, saturant, and coatings; physical properties, surface finish, saturation, freedom from defects, stickiness, packing, sampling and methods of testing, inspection, and basis of rejection.

American Society for Testing Materials, D 226-44; 1944. Asphalt-Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs. Covers two types—15-lb. and 30-lb. Gives requirements for mopping materials, manufacture, character of felt, character of saturant, surface finish, physical properties, pliability and stickiness, packing, marking, sampling and testing, and inspection.

American Society for Testing Materials, D 228-44 T; 1944. Tentative Methods of Testing Asphalt Roll Roofing, Cap Sheets, and Shingles. Includes roll roofing coated with powder, surfaced with granules on weather side and coated on exposed half of the weather side with mineral granules; requirements for sampling, methods of physical testing for roll and cap sheets and for shingles; and for analysis of roofing composition, saturant in dry felt, weight of weather side coating and reverse side coating soluble in carbon disulfide; ash, weight of dry saturated felt, and weight of mineral matter.

American Society for Testing Materials, D 249-44T; 1944. Tentative Specifications for Asphalt Roofing Surfaced With Coarse Mineral Granules. Covers asphalt roofing in sheet form surfaced with colored mineral granules, either 36 or 32 in. in width, composed of roofing-felt saturated and coated on both sides with asphalt and surfaced on the weather side with granulated slate or equivalent mineral material (of solid or mixed colors as may be agreed upon by the purchaser and the seller) and on the reverse side with powdered talc or mica. Manufacture, Character of felt, saturant, and coatings; physical properties, surface finish, gage, saturation, packing, nails and lap-cement, sampling and testing, inspection, and basis of rejection. A.S.T.M. Emergency Alternate Provision EA-D 249b; 1944, affected section 6 Surface Finish, table I Physical Requirements of Asphalt Roofing, section 10 Packing, and section 12 Nails and Lap-Cement.

American Society for Testing Materials, D 250-44T; 1944. Tentative Specifications for Asphalt-Saturated Asbestos Felt for Use in Waterproofing and in Constructing Built-Up Roofs. Covers quality of felt containing 85 percent asbestos, saturant, character or felt after saturation, surfacing, physical properties, stickiness, sampling, and testing.

American Society for Testing Materials, D 312-44; 1944. Asphalt for Use in Constructing Built-Up Roof Coverings. Covers asphalt intended for use as hot-cement and mopping coat in the construction of built-up roof coverings for roofs surfaced in various manners, laid either over boards or concrete on various inclines, in connection with the Tentative Specifications for Asphalt-Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs (A.S.T.M. Designation D 226) or the Standard Specifications for Asphalt-Saturated Asbestos Felt for Use in Constructing Built-Up Roofs (A.S.T.M. Designation D 250) of the American Society for Testing Materials. Types, properties, and sampling and methods of testing.

American Society for Testing Materials, D 313-41; 1941. Method of Test for Coarse Particles in Mixtures of Asphalt and Mineral Matter. Covers the procedure for determining the amount of particles of mineral or other insoluble matter in asphaltic mixtures that are retained upon a No. 200 (74-micron) sieve. Sampling, preparation of sample, apparatus, procedure, and calculation.

American Society for Testing Materials, D 371-44; 1944. Wide Selvage Asphalt Roofing Surfaced With Coarse Mineral Granules. Covers asphalt roofing in sheet form, either 36 or 32 in. in width, composed of asphalt-saturated roofing felt coated on approximately one-half of the width of the weather side with asphalt, and surfaced on the coated portion with mineral granules. This roofing is used as a cap sheet in the construction of built-up roofs. Manufacture, character of felt, saturant and coatings, properties, surface finish, freedom from defects, pliability and stickiness, packing, sampling and methods of testing, and basis of rejection.

American Society for Testing Materials, D 449-42 T; 1942. Tentative Specifications for Asphalt for Dampproofing and Waterproofing. For use as mopping coat in dampproofing, or as plying or mopping cement in construction of membrane system of waterproofing. Requires that primer meet D 41, asphalt felt D 226, asbestos felt D 250, and cotton fabrics D 173 of A.S.T.M. Includes soft, adhesive, self-healing asphalt for use below ground, and a less susceptible asphalt for use above ground, physical properties, and tests using A.S.T.M. methods.

American Society for Testing Materials, D 451-40; 1940. Method of Test for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing and Shingles. For Crushed slate, stone, etc., used on the weather surface of prepared asphalt roofing and shingles. Covers a set of consecutive sieves conforming to A.S.T.M. specification E 11, sieve shaker, preparation of sample, method of analysis, and form of report.

American Society for Testing Materials, D 452-40; 1940. Method of Test for Sieve Analysis of Nongranular Mineral Surfacing for Asphalt Roofing and Shingles. For mica, talc, and other powdered or flaky minerals used on the weather surface of prepared asphalt roofing and on the nonweather-exposed surface of asphalt shingles. Covers a set of sieves conforming to A.S.T.M. specification E 11, sieve shaker, preparation of sample, method of analysis, and form of report.

American Society for Testing Materials, D 491-41; 1941. Asphalt Mastic for Use in Waterproofing (Asphalt Cement, Mineral Filler, Mineral Aggregate). For waterproofing the floors of buildings and bridges; for reservoirs, waterways, subways, and similar structures; but not for use as a pavement for either foot or vehicular traffic. Character of mastic, properties of asphalt cement and of asphalt mastic, and methods of testing.

American Society for Testing Materials, D 655-44 T; 1944. Tentative Specifications for Asphalt-Saturated and Coated Asbestos Felts for Use in Constructing Built-Up Roofs. Cover asphalt-saturated and asphalt-coated asbestos felts in sheet form for use in the construction of built-up roofs.

American Society for Testing Materials, D 699-44; 1944. Asphalt Siding Surfaced With Coarse Mineral Granules. Cover asphalt siding in strip or individual form surfaced with colored mineral granules, and composed of roofing felt saturated and coated on both sides with asphalt and surfaced on the weather side with granulated slate or equivalent mineral material, and surfaced on the reverse side with suitable material to prevent sticking in the package.

Underwriters' Laboratories, Inc. Standard for Class "C" Asphalt Rag-Felt Sheet Roofing and Shingles, 1941. For installation as prepared roof coverings in accordance with direction sheets for application packed with the products. Description, felt, saturant, and coating, surfacing materials, felt after saturation, finished product, dimensions, weight, lap-cement, nails for sheet roofing, packing, instructions for application, apparatus and instructions of procedure for tests, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Rag-Felt Roof Covering Materials for Use in Construction of Built-Up Roof Coverings, 1941. Covers asphalt, asphalt-saturated rag-felt, coal tar and coal-tar saturated rag-felt for installation as built-up roof coverings in accordance with the descriptive matter contained in the List of Inspected Fire Protection Equipment and Materials published periodically by Underwriters' Laboratories, Inc. Covers asphalt; asphalt-saturated rag-felt; coal tar; coal-tar saturated rag-felt; apparatus and methods of procedure for tests of roof-covering materials; and inspection of listed product.

United Roofing Contractors Assn. Recommended Roof Standardization, 1942. It is recommended that only 29 types of asphalt-prepared roofing and siding be produced as regular stock types. Gives table showing size, square feet per roll, headlap, exposure, total area of roofing per square, weight of dry felt, nominal weight per 100 sq.ft., maximum number of colors or finishes, and shipping weight for these 29 types which include strip shingles, individual shingles, siding, mineral-surfaced roll roofings, smooth-surfaced roll roofings, and saturated felts for built-up roofing.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS6; 1938. Survey of Roofing Materials in the Southeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Southeastern States is described. Detailed studies of roofing materials in Greensboro, N. C.; Columbia, S. C.; Savannah and Atlanta, Ga.; Jacksonville and Orlando, Fla.; Birmingham, Ala.; Knoxville, Tenn.; and Charleston, W. Va., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 2,500 miles of highway, is included. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS29; 1939. Survey of Roofing Materials in the Northeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Northeastern States is described, with numerous comparative references to a similar survey in the Southeastern States. Detailed studies of roofing materials in Wilmington, Del.; Philadelphia, Pa.; New Haven, Conn.; Boston, Mass.; Manchester, N. H.; Portland, Maine; Rutland, Vt.; and Albany and Syracuse, N. Y., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 1,800 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 21,000 rural and small-town dwellings along 4,000 miles of highway in 20 Eastern States. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS70; 1941. Asphalt-Prepared Roll Roofings and Shingles. Asphalt-prepared roofings are defined, their development is sketched briefly, and recent statistics of production are presented. Factors which influence the choice of roofing materials generally are discussed. Materials used in the manufacture of asphalt-prepared roofings and the processes of manufacture are described. Analyses of typical roofings are shown. Factors which should be considered in purchasing asphalt-prepared roll roofings and shingles are discussed and illustrated graphically for types of shingles that are used most generally. Methods of application and maintenance are described, and the weathering of asphalt-prepared roofings is discussed.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS75; 1941. Survey of Roofing Materials in the North Central States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the North Central States is described, with numerous references to similar surveys made previously in the Southeastern and Northeastern States. Detailed studies of roofing materials in Pittsburgh, Pa.; Cincinnati and Toledo, Ohio; Grand Rapids and Lansing, Mich.; Chicago, Ill.; Milwaukee, Wis.; St. Paul, Minn.; Bismarch, N. Dak.; Sioux Falls, S. Dak.; Omaha, Nebr.; Kansas City, Moberly, and St. Louis, Mo.; and Indianapolis, Ind., are reported. A tabulation, by states, of the kinds of roofing materials, used on more than 8,000 rural and small-town dwellings, along approximately 3,000 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 28,000 rural and small-town dwellings along 7,000 miles of highway in the 32 states covered by the three surveys. Forty-eight photographs, illustrating type of weathering of roofing materials, and features of design and construction of roofs, are shown.

U. S. Gov., Federal Specification HH-F-191a; 1942. Felt; Asphalt-Saturated, (for) Flashings, Roofing, and Waterproofing. Covers two types—(I) for mineral-surfaced built-up roofing and for membrane waterproofing and (II) for flashings. Gives requirements for material, appearance, physical characteristics, and chemical requirements; methods of inspection, determination of weight and width, sampling, and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-A-666; 1933. Asphalt; (for) Built-Up Roofing, Waterproofing, and Dampproofing. Covers three types—(I) for surfaced, built-up roofing; (II) for unsurfaced, built-up roofing; and (III) for waterproofing and dampproofing. Gives requirements for chemical and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-R-451; 1933. Roof-Coating; Asphalt, Brushing-Consistency. Covers one type. Gives requirements for condition in container, consistency, nonvolatile matter, mineral filler, and behavior at 60° C. and 0° C; methods of sampling and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-R-501; 1933. Roofing; Asphalt-Prepared, Smooth-Surfaced. Covers two grades—(A) heavy weight and (B) medium weight. Gives requirements for appearance, chemical and physical properties, and lap-cement; methods of inspection, determination of weight and width, sampling, and testing; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-SS-R-501; 1941, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for grades, material, appearance, physical characteristics, chemical composition, and lap-cement.

U. S. Gov., Federal Specification SS-R-511; 1933. Roofing; Asphalt and Asbestos-Prepared, Mineral-Surfaced. Covers one type. Gives requirements for color and appearance, chemical and physical properties, and lap-cement; methods of inspection, determination of weight and width, sampling and testing; requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-R-521; 1933. Roofing and Shingles; Asphalt-Prepared, Mineral-Surfaced. Covers two types—(I) roofing (II) shingles. Gives requirements for color and appearance, physical and chemical properties, and lap-cement; methods of inspection, determination of weight and width, sampling and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Waterproofing.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Dampproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 7Yg; 1934. Roofing, Siding, and Sheet Metal Work; Dampproofing and Membrane Waterproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 15Yb; 1934. Standard Methods for Inspection of Materials for Roofing, Siding, Sheet Metal Work, Dampproofing, and Waterproofing.

U. S. Gov., Treasury Dept., Procurement Div., 438A; 1942. Priming-Material, Bituminous (Nonbleeding), Brushing and Spraying Consistency (for Concrete, Masonry, and Other Mineral Surfaces). Shall consist of a suitable bituminous base dissolved in a suitable volatile organic solvent. Gives requirements for color, consistency, nonvolatile matter, ash content, heat and cold test, and paint bleeding test; methods of sampling, inspection, and tests.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0; granular slate for roofings, *see* 511.52; roofing felts, *see* 365.98, 473.2; roofing nails, *see* 608.11; tar roofing and waterproofing, *see* 505.36; roof construction, *see* 518.57; cotton fabric for waterproofing, *see* 392.4.

505.17 Asphaltic Mastic Flooring

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Asphalt Mastic Floors and Asphalt Block Floors. Gives requirements for sub-grade and foundation, mastic slabs, asphaltic cement, aggregate, and construction.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Membrane Waterproofing. Gives requirements for asphalt mastic.

American Society for Testing Materials, D 491-41; 1941. Asphalt Mastic for Use in Waterproofing (Asphalt Cement, Mineral Filler, Mineral Aggregate). For waterproofing the floors of buildings and bridges, for reservoirs, waterways, subways, and similar structures but not for use as a pavement for either foot or vehicular traffic. Character of mastic, properties of asphalt cement and of asphalt mastic, and methods of testing.

American Society for Testing Materials, D 517-40; 1940. Asphalt Plank. For use in bridge floors, plain and mineral-surfaced asphalt plank; requirements for manufacture, mineral surfacing, asphalt cement, fibrous material, mineral filler, absorption, brittleness, indentation, sampling, and methods of testing.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 4.20; 1938. Watertight Floors. Covers methods for improving construction where floor leakage is a serious defect. Includes description of common methods of waterproofing (hot asphalt mastic flooring, emulsified asphalt flooring, magnesite composition flooring, and light weight special surfacing); recent developments in waterproofing; and general precautions.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS14; 1939. Indentation and Recovery of Low-Cost Floor Coverings. Indentation and recovery determinations for loads ranging from 25 lb. to 200 lb. on a flat-ended pin 1/4 in. in diameter were made on 23 floor coverings at a relative humidity of 65 percent and temperature of 72° F. Indentation readings were taken for each load at intervals of time up to 30 min. and then recovery readings at intervals of time up to 120 min. Various types of floor coverings were tested, such as asphalt tile, pressed fiber board, linoleums, felt-base floor coverings having various wearing surfaces, rubber, and wood. A description of the apparatus and the procedure used are given. The results are presented in graphic form to show the relative merits of the various floor coverings with respect to initial and 30-min. indentation under various loads and the recovery after removal of the load.

U. S. Gov., Dept. of Commerce. National Bureau of Standards. Building Materials and Structures Report BMS43; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 2. In the second series, 40 installations were subjected to a performance test in the floor-testing chamber of the National Bureau of Standards. Included in the tests were battleship linoleum, rubber in sheet and tile form, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of asphalt tiles. The bonding agents used included lignin pastes, resinous cements, latex adhesives, rubber cements, cut-back asphalt, and asphalt emulsions. Installations were made on both concrete and wood subfloors. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries showing the performance of the test panels are given, and the appearance of the different floor coverings after 48,000 cycles of the testing equipment is shown by representative photographs.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, stripwood, and plywood subfloors. Installations on stripwood subfloors were made with underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given, and photographs of the test panels after 48,000 cycles of the testing equipment are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS73; 1941. Indentation Characteristics of Floor Coverings. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65 percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevated temperature of 90° F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedures are briefly described. Summaries of the results are present to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 26 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were cork tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given, and their appearance at the end of the test, is shown by photographs. A few generalized comments and conclusions are made.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Mineral-Surfaced Asphalt Plank.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0; asphalt for bituminous carpets, *see* 505.19.

505.19 Miscellaneous Specifications for Asphalt

American Assn. of State Highway Officials, M46-38. Standard Specifications for Premolded Asphalt Plank. Gives scope, manufacture, mineral surfacing, workmanship, asphalt cement, fiber, mineral filler, dimensions, absorption, brittleness, indentation, and sampling and testing.

American Assn. of State Highway Officials, M47-42. Standard Specifications for Emulsified Asphalt. Covers emulsified asphalt for open-graded coarse aggregate plant mixtures. Gives general requirements, properties and tests, basis of purchase, methods of sampling, and methods of testing.

American Assn. of State Highway Officials, M48-42. Standard Specifications for Emulsified Asphalt. Covers emulsified asphalt for open-graded coarse aggregate mixed-in-place construction. Gives general requirements, properties and tests, basis of purchase, methods of sampling, and methods of testing.

American Assn. of State Highway Officials, M49-42. Standard Specifications for Emulsified Asphalt. Covers emulsified asphalt for summer use in bituminous concrete mixtures for repair work. Gives general requirements, properties and tests, basis of purchase, methods of sampling, and methods of testing.

American Assn. of State Highway Officials, M50-42. Standard Specifications for Emulsified Asphalt. Covers emulsified asphalt which does not separate as the result of freezing. Gives general requirements, properties and tests, basis of purchase, methods of sampling, and methods of testing.

American Assn. of State Highway Officials, M51-42. Standard Specifications for Emulsified Asphalt. Covers emulsified asphalt for penetration macadam construction. Gives general requirements, properties and tests, basis of purchase, methods of sampling, and methods of testing.

American Assn. of State Highway Officials, M88-42. Standard Specifications for Emulsified Asphalt. Covers emulsified asphalt for the surface treatment of roads. Gives general requirements, properties and tests, basis of purchase, methods of sampling, and methods of testing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Bituminous Emulsions for Dampproofing. Covers materials and methods for dampproofing steel and concrete surfaces by use of asphalt emulsions (clay type) and concrete surfaces by use of coal-tar emulsions (soap type). Gives requirements for materials and applications.

American Society for Testing Materials, D 397-39; 1939. Medium-Setting Emulsified Asphalt (for Coarse Aggregate Plant Mixes). Gives limits for retention on 1/8-in. screen, homogeneity, viscosity, residue, settlement, demulsibility, miscibility in water, and requirements for coating dry stone, sampling, and methods of testing.

American Society for Testing Materials, D 398-39; 1939. Medium-Setting Emulsified Asphalt (for Retread and Coarse Aggregate Mixes). Covers a low consistency emulsified asphalt for retread mixes; limits for retention on 1/8-in. sieve, homogeneity, viscosity, residue, settlement, demulsibility, miscibility with water; requirements for coating dry stone, sampling, and methods of testing.

American Society for Testing Materials, D 399-39; 1939. Medium-Setting Emulsified Asphalt (Heavy Premix—Summer Grade). Covers a high-consistency emulsified asphalt for plant mix or patching with coarse aggregates; limits for retention on 1/8-in. sieve, homogeneity, residue, miscibility with water; requirements for coating dry stone, sampling, and methods of testing.

American Society for Testing Materials, D 401-40; 1940. Quick-Setting Emulsified Asphalt (for Penetration and Surface Treatment). Gives requirements for homogeneity, viscosity, residue, settlement, penetration, ductility, sampling, and tests in accordance with A. S. T. M. method D 244.

American Society for Testing Materials, D 466-42; 1942. Methods of Testing Films Deposited From Bituminous Emulsions. Covers resistance to flow under heat (slide test), and resistance to water action. Slide test for emulsions applied at rate of not less than 3 gal. per 100 sq. ft. on substantially vertical surfaces, using standard ceramic tile and brass mask test in heated oven, and test procedure for adhesion or dried film and resistance to re-emulsification.

American Society for Testing Materials, D 631-43; 1943. Slow-Setting Emulsified Asphalt (for Fine Aggregate Mixes). Cover a slow-setting emulsified asphalt for fine aggretate mixes in which a substantial quantity of aggregate passes a 1/8-in. sieve and a portion may pass a No. 200 (74-micron) sieve. Covers properties and tests, basis of purchase, sampling, and methods of testing.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention 4.20; 1938. Watertight Floors. Covers methods for improving construction where floor leakage is a serious defect. Includes description of common methods of waterproofing (hot asphalt mastic flooring, emulsified asphalt flooring, magnesite composition flooring, and light weight special surfacing); recent developments in waterproofing; and general precautions.

U. S. Gov., Federal Specification SS-A-671a; 1941. Asphalt; Cut-Back (for) Road Work. Covers six types of medium curing, and six types of rapid curing. Gives requirements for chemical composition and physical properties; methods of testing; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-A-674a; 1944. Asphalt; Emulsion (for) Road Work. Covers six types—(I) open graded coarse aggregate plant mixtures, (II) open graded coarse aggregate mixed-in-place construction, (III) for summer use in bituminous concrete mixtures for repair work, (IV) for winter use in bituminous concrete mixtures for repair work, (V) penetration macadam and surface treatment work, and (VI) fine aggregate mixes in which a substantial quantity of aggregate passes a 1/8-in. sieve and a portion may pass a No. 200 sieve. Gives detailed requirements for physical properties; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 439A; 1942. Coating-Material; Bituminous (Nonbleeding), Brushing-Consistency (for Foundations, Roofs, Walls, Etc.). Shall be composed of suitable inorganic filler, volatile organic solvent, and binder consisting of suitable bituminous materials; intended for use as a dampproofing material in the maintenance of bituminous and metal roofing and for application on walls and foundations. Gives requirements for colors; consistency, nonvolatile matter, inorganic filler and tinting material, heat and cold test, and paint bleeding test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-160; 1933. Asphalt, for Use in Manufacture of Fiber Containers.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0.

505.2 ROAD OILS

505.20 General Items

American Assn. of State Highway Officials, T54-35. Standard Method of Test for Specific Viscosity (Engler). The viscosity of fluid bituminous road materials may be determined at any suitable temperature by means of the Engler viscosimeter. Gives details for this process.

American Society for Testing Materials, D 95-40; 1940. American Petroleum Institute Standard, 519-40. American Assn. of State Highway Officials, T 55-42. American Standards Assn., Z11.9-1940. Method of Test for Water in Petroleum Products and Other Bituminous Materials. Especially applicable to petroleum, fuel oil, road oil, coal tar, water-gas tar, coke-oven tar, etc. Determination of water by distilling sample with volatile solvent, dimensions and design of still, distillation requirements of solvent, test procedure.

505.21 Oil for Cold Application to Roads

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.20; asphaltic road oils, *see* 505.14; road tars, *see* 505.31-505.35.

505.22 Oil for Hot Application to Roads

U. S. Gov., Federal Specification VV-O-751; 1931. Oil; Road, Type OH-1-25, Hot Application. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.20; asphaltic road oils, *see* 505.14; road tars, *see* 505.31-505.35.

505.23 Oil Asphalt

References.—Oil asphalt, *see* 505.14.

505.29 Miscellaneous Specifications for Road Oils

American Society for Testing Materials, D 98-34; 1934. Calcium Chloride. Includes use for dust prevention, acceleration of setting of concrete, and curing concrete. Gives requirements for chemical composition, screen analysis, and packing.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.20.

505.3 TAR AND TAR PITCH

References.—Coal-tar chemical products, *see* 800-809.

505.30 General Items

American Assn. of State Highway Officials, T108-42. Standard Method of Test for Sulfonation Index of Road Tar. Gives scope, solutions required, apparatus, procedure, and precautions.

American Society for Testing Materials, D4-42; 1942. American Standards Assn., A 37.3-1943. Method of Test for Determination of Bitumen. Intended for the determination of bitumen in materials containing at least 25 percent bitumen. Covers apparatus, preparation of sample, preparation of Gooch crucible, methods of procedure, calculation, and report.

American Society for Testing Materials, D 5-25; 1925. American Assn. of State Highway Officials, T 49-42. American Standards Assn., A37.1-1930. Method of Test for Penetration of Bituminous Materials. Dimensions and construction of container and needle, water bath standard temperature, preparation of sample, test procedure.

American Society for Testing Materials, D 20-30; 1930. American Standards Assn., A 37.9-1943. American Assn. of State Highway Officials, T 52-42. Method of Test for Distillation of Tar Products Suitable for Road Treatment. Covers apparatus, preparation and dehydration of sample, details for assembly of apparatus, and method of procedure for determination of percentages distilled at varying temperatures.

American Society for Testing Materials, D 36-26; 1926. American Standards Assn., A 37.10-1943. American Assn. of State Highway Officials, T 53-42. Method of Test for Softening Point of Bituminous Materials (Ring-and-Ball Method). Gives dimensions and design of ring, steel ball, container, and thermometer; method of preparing sample, rate of heating, permissible variations, modifications for hard materials, and precautions to be observed.

American Society for Testing Materials, D 61-38; 1938. Method of Test for Softening Point of Tar Products (Cube-in-Water Method). Describes form of mold, hook, and container; assembly of apparatus, preparation of sample, and procedures for ordinary and low melting point pitches.

American Society for Testing Materials, D 70-27; 1927. Method of Test for Specific Gravity of Road Oils, Road Tars, Asphalt Cements, and Soft Tar Pitches. Requirements for pycnometer or weighing bottle size and weight, and ratio of weight of fluid to that of distilled water, with precautions to be observed.

American Society for Testing Materials, D 71-27; 1927. Method of Test for Specific Gravity of Asphalts and Tar Pitches Sufficiently Solid To Be Handled in Fragments. For determination by use of an analytical balance equipped with a pan straddle or other stationary support. Preparation of test specimen and method of procedure.

American Society for Testing Materials, D 95-40; 1940. American Petroleum Institute Standard, 519-40. American Assn. of State Highway Officials, T 55-42. American Standards Assn., Z 11.9-1940. Method of Test for Water in Petroleum Products and Other Bituminous Materials. Especially applicable to petroleum, fuel oil, road oil, coal tar, water-gas tar, coke-oven tar, etc. Determination of water by distilling sample with volatile solvent, dimensions and design of still, distillation requirements of solvent, test procedure.

American Society for Testing Materials, D 139-27; 1927. American Assn. of State Highway Officials, T 50-42. American Standards Assn., A37.2-1930. Method of Float Test for Bituminous Materials. Weight and dimensions of aluminum float and brass collar, assembly of apparatus, design and graduation of thermometer, preparation of sample, and test procedure for asphalt products and for tar products.

American Society for Testing Materials, D 165-42; 1942. American Assn. of State Highway Officials, T 45-42. American Standards Assn., A 37.12-1943. Method of Test for Proportion of Bitumen Soluble in Carbon Tetrachloride. Covers apparatus required, preparation of sample, outline of procedure, and calculation of percentage.

American Society for Testing Materials, D 243-36; 1936. American Assn. of State Highway Officials, T 56-42. American Standards Assn., A 37.13-1943. Method of Test for Residue of Specified Penetration. Applies to specified penetration of residue obtained by heating road oil or semisolid asphalt at 249° to 260° C. Describes apparatus necessary, sample, procedure, precautions, and reproducibility of results.

American Society for Testing Materials, D 633-44; 1944. Volume Correction Table for Tar and Coal-Tar Pitch. A short and convenient table for reducing volumes of road tar and coal-tar pitch to the basis of 60° F. when extreme accuracy is not required. The table shows the volume occupied at 60° F. by a quantity of material occupying unit volume at the indicated temperature.

American Society for Testing Materials, E 28-42 T; 1942. Tentative Method of Test for Softening Point (Ball and Shouldered Ring Apparatus). Applicable to asphalts, tars, pitches, rosins, and most resins—both natural and synthetic. Apparatus, preparation of sample, procedure, softening point, precautions, and reproducibility of results.

505.31 Tars for Cold Application to Roads

American Public Works Assn. Specification for Pavement Foundation of Tar Macadam (Cold Penetration Type), B7-36; 1936. For materials and methods of construction, including requirements for refined tar for cold application, tested in accordance with A. S. T. M. methods.

American Society for Testing Materials, D 490-43T; 1943. Tentative Specifications for Tar. Includes 14 grades of tar for use in prime coat application, light surface treatment, surface treatment, road mix, plant mix, seal coat, penetration, crack filler, and patching, including low-temperature application and quick-setting. Gives requirements for sampling, specific gravity, specific viscosity, float test, distillation, softening point, sulfonation index, and total bitumen.

U. S. Gov., Navy Dept. Specification 52T5a; 1942. Tar; Coal.

References.—Definitions, methods or sampling and of testing, *see* 502.2, 505.0, 505.30; tar for repair work, cold application, *see* 505.34.

505.32 Tars for Hot Application to Roads

American Public Works Assn. Specification for Pavement Foundation of Tar Macadam (Hot Penetration Type), B6-36; 1936. For materials and methods of construction including requirements for refined tar, tests in accordance with A. S. T. M. methods, crushed stone, and for block pavement surface course preparation of sand-tar cushion.

American Society for Testing Materials, D 490-43T; 1943. Tentative Specifications for Tar. Includes 14 grades of tar for use in prime coat application, light surface treatment, surface treatment, road mix, plant mix, seal coat, penetration, crack filler, and patching, including low-temperature application and quick-setting. Gives requirements for sampling, specific gravity, specific viscosity, float Test, distillation, softening point, sulfonation index, and total bitumen.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.30; bituminous fillers, *see* 505.15; tar for repair work, hot application, *see* 505.34.

505.33 Tars for Road Construction

American Assn. of State Highway Officials, M52-42. Standard Specifications for Tar for Use in Road Construction. Gives scope, general requirements, properties, methods of sampling and testing, and table showing physical properties for various grades.

American Public Works Assn. Specification for Stone Block Pavement, E1-36; 1936. Includes requirements for tar pitch filler as to water, softening point, distillation range, specific gravity, ductility, and total bitumen soluble in carbon disulfide; and for asphalt cement filler as to water, penetration, flash point, loss on heating, ductility, and bitumen soluble in carbon tetrachloride. Also for mixture of tar and asphalt filler.

American Wood-Preservers' Assn., 15b; 1938. Standard Specifications for Preservatives for Flooring and Paving Blocks. Includes coal-tar paving solution. Shall be a coal-tar product, of which at least 65 percent shall be a distillate of coal tar and the remainder shall be refined or filtered coal-gas tar. Gives requirements for water content, matter insoluble in benzol, specific gravity, distillation limits, and coke residue.

U. S. Gov., Federal Specification R-T-143; 1940. Amendment 1; 1944. Tars, (for Use in) Road Construction. Covers 14 grades. Gives requirements for materials, Engler specific viscosity, float test, specific gravity, total bitumen, water percent by volume, distillation percent by weight, and softening point of distillation residue; methods for sampling and testing; and packing and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.30; pitch and other bituminous fillers, *see* 505.15; tar for cold application, *see* 505.31; tar for hot application, *see* 505.32; tar for repair work, *see* 505.34; tar cement, *see* 505.35.

505.34 Tars for Repair Work

American Society for Testing Materials, D 490-43T; 1943. Tentative Specifications for Tar. Includes 14 grades of tar for use in prime coat application, light surface treatment, surface treatment, road mix, plant mix, seal coat, penetration, crack filler, and patching, including low-temperature application and quick-setting. Gives requirements for sampling, specific gravity, specific viscosity, float test, distillation, softening point, sulfonation index, and total bitumen.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.30; tar cement, *see* 505.35.

505.35 Tar Cement

American Public Works Assn. Specification for Modified Tar Macadam Pavement, G6-36; 1936. Includes requirements for cold tar cement as to water, specific gravity, viscosity, distillation range, residue, softening point, and bitumen soluble in carbon disulfide; also for tar seal coat, using A. S. T. M. methods of test.

American Public Works Assn. Specification for Tar Macadam Pavement, G9-36; 1936. For hot tar cement, homogeneous and water-free, specific gravity, float test, distillation range, residue by weight, softening point, and bitumen soluble in carbon disulfide, using A. S. T. M. methods for test.

American Society for Testing Materials, D 490-43T; 1943. Tentative Specifications for Tar. Includes 14 grades of tar for use in prime coat application, light surface treatment, surface treatment, road mix, plant mix, seal coat, penetration, crack filler, and patching, including low-temperature application and quick-setting. Gives requirements for sampling specific gravity, specific viscosity, float test, distillation, softening point, sulfonation index, and total bitumen.

U. S. Gov., Treasury Dept., Procurement Div., No. 278; 1938. Cement; Bituminous, Plastic Vegetable-Oil-Pitch-Base. Covers one type and one grade. Cement shall be composed of a suitable inorganic filler, suitable solvent, and a nonvolatile bituminous binder. The binder shall be mainly a vegetable-oil-pitch. Intended for use in repairs of roofs, walls, and foundations and as an expansion joint and caulking material. Gives requirements for nonvolatile matter, inorganic filler, workability, heat and cold test, joint test, strain test, and bleeding test; methods of sampling, inspection, and tests; and packaging and marking.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.30; tar cement for repair work, *see* 505.34.

505.36 Tar and Tar Felt for Roofing and Waterproofing

American Assn. of State Highway Officials, M118-42. Standard Specifications for Coal-Tar Pitch for Roofing, Dampproofing, and Waterproofing. Gives scope, primer, types, properties, methods of sampling and testing, and table showing requirements.

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for waterproofing and for dampproofing—requirements for material, fabric and joint filler (to conform with American Society for Testing Materials specification); storage of fabric, preparation of surface; application; damage patching; protection course; and measurement and payment.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Built-Up Roofing. Gives requirements for materials (pitch, asphalt, asphalt primer, roofing felt, ready or prepared asphalt roofings, flashings, gravel, and slag); tarred rag felt, pitch and gravel (or slag) over wood or pre-cast units (type A-1), and over homogeneous roofs cast in place (type A-2); tarred rag felt, steep roofing pitch and slag, for use over wood or pre-cast concrete or gypsum units (type A-3), and over homogeneous roofs cast in place (type A-4); asphalt rag felt, asphalt and gravel (or slag) over wood or pre-cast units (type B-1), and over homogeneous roofs cast in place (type B-2); asphalt impregnated asbestos felt and asphalt (smooth surface) over wood or pre-cast units (type C-1—classes 1, 2, and 3), and over homogeneous roofs cast in place (type C-2—classes 1, 2, and 3); and asphalt rag felt and asphalt (smooth surface) over wood or pre-cast units (type D-1), and over homogeneous roofs cast in place (type D-2).

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Membrane Waterproofing. Gives requirements for coal-tar pitch for saturant and mopping.

American Society for Testing Materials, D 43-41; 1941. American Assn. of State Highway Officials, M 121-42. Creosote for Priming Coat With Coal-Tar Pitch in Dampproofing and Waterproofing. For application to concrete and masonry surfaces, for use with coal-tar pitch in dampproofing and waterproofing. Maximum water, consistency, specific gravity, matter insoluble in benzol, distillation range, coke residue, procedure for sampling, and methods of testing.

American Society for Testing Materials, D 146-44T; 1944. Tentative Methods of Testing Felted and Woven Fabrics Saturated With Bituminous Substances for Use in Waterproofing and Roofing. Covers fabrics saturated (but not coated) with asphalt or coal-tar products for use in membrane waterproofing. Sampling, requirements of finished fabric as to area, weight, loose surfacing, moisture, strength, pliability, water absorption, loss on heating, and distillation of coal-tar saturated felt, and for desaturated fabric, weight, carbonaceous matter, total comminuted surfacing, saturant, and ash.

American Society for Testing Materials, D 227-44; 1944. Coal-Tar Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs. Manufacture, character of felt, saturant, character of felt after saturation, surfacing, physical properties, stickiness, packing, sampling and methods of testing, inspection, and basis of rejection.

American Society for Testing Materials, D 450-41; 1941. Coal-Tar Pitch for Roofing, Dampproofing, and Waterproofing. For use as mopping coat in built-up roofs surfaced with slag or gravel, as mopping coat in dampproofing, or as plying or mopping cement in membrane materials, types, properties, and methods of sampling and testing.

American Society for Testing Materials, D 654-42 T; 1942. Tentative Specifications for Coal-Tar Pitch for Steep Built-Up Roofs. Cover coal-tar pitch suitable for use as a mopping coat and for embedding slag or gravel in the construction of steep built-up roofs with inclines of 1 to 6 in. per horizontal foot, where nailing is employed.

Underwriters' Laboratories, Inc. Standard for Rag-Felt Roof Covering Materials for Use in Construction of Built-Up Roof Coverings, 1941. Covers asphalt, asphalt-saturated rag-felt, coal tar and coal-tar saturated rag-felt for installation as built-up roof coverings in accordance with the descriptive matter contained in the List of Inspected Fire Protection Equipment and Materials published periodically by Underwriters' Laboratories, Inc. Covers asphalt; asphalt-saturated rag-felt; coal tar; coal-tar saturated rag-felt; apparatus and methods of procedure for tests of roof-covering materials; and inspection of listed product.

United Roofing Contractors Assn. Gravel or Slag Roofing Specification, 1915. One construction specification for use over concrete and one for use over board sheathing, requirements on procedure in laying felt, amount of lap, mopping and nailing procedure, minimum weights of felt and of gravel, required use of U.R.C.A. inspected materials, inspection requirements of materials not stated. Covers pitch roofs only.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-94; 1944. Compound; Waterproofing Bituminous, for Crate Topcoating.

U. S. Gov., Federal Specification R-P-381; 1933. Pitch; Coal-Tar (for) Mineral-Surfaced Built-Up Roofing, Waterproofing and Dampproofing. Covers two types—(I) coal-tar pitch for built-up roofing and (II) coal-tar pitch for waterproofing and dampproofing. Gives requirements for appearance, softening point, ductility, specific gravity, insoluble in carbon bisulphide, ash, distillate, and specific gravity of distillate; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-F-201; 1933. Amendment 1; 1943. Coal-Tar-Saturated (for) Roofing and Waterproofing. Covers two types—(I) 15-lb. and (II) 30-lb. Gives requirements for material, appearance, physical characteristics, and chemical composition; methods of inspection, determination of weight and width, sampling, and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Waterproofing.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Dampproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 7Yg; 1934. Roofing, Siding, and Sheet Metal Work; Dampproofing and Membrane Waterproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 15Yb; 1934. Standard Methods for Inspection of Materials for Roofing, Siding, Sheet Metal Work, Dampproofing, and Waterproofing.

U. S. Gov., Treasury Dept., Procurement Div., 438A; 1942. Priming-Material; Bituminous (Nonbleeding), Brushing and Spraying Consistency (for Concrete, Masonry, and Other Mineral Surfaces). Shall consist of a suitable bituminous base dissolved in a suitable volatile organic solvent. Gives requirements for color, consistency, nonvolatile matter, ash content, heat and cold test, and paint bleeding test; methods of sampling, inspection, and test.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.30; asphalt roofing and waterproofing, *see* 505.16; roofing felts, *see* 365.98, 473.2; roof construction, *see* 518.57; cotton fabric for waterproofing, *see* 392.4.

505.37 Tar Oils

American Wood-Preservers' Assn., 15b; 1938. Standard Specifications for Preservatives for Flooring and Paving Blocks. Includes refined water-gas tar. Gives requirements for water content, matter insoluble in benzol and chloroform, specific gravity, and distillation limits.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.30; creosote and naphthalene, *see* 801.3, 801.4.

505.39 Miscellaneous Specifications for Tar

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Bituminous Emulsions for Dampproofing. Covers materials and methods for dampproofing steel and concrete surfaces by use of asphalt emulsions (clay type) and concrete surfaces by use of coal-tar emulsions (soap type). Gives requirements for materials and applications.

American Society for Testing Materials, D 112-30; 1930. Coal-Tar Pitch for Stone Block Filler. Gives requirements for allowable water, softening point, distillation test, specific gravity, ductility, total bitumen, and applicable to A. S. T. M. methods of testing.

U. S. Gov., Treasury Dept., Procurement Div., 439A; 1942. Coating-Material; Bituminous (Nonbleeding), Brushing-Consistency (for Foundations, Roofs, Walls, Etc.). Shall be composed of suitable inorganic filler, volatile organic solvent, and binder consisting of suitable bituminous materials; intended for use as a dampproofing material in the maintenance of bituminous and metal roofing and for application on walls and foundations. Gives requirements for colors; consistency, nonvolatile matter, inorganic filler and tinting material, heat and cold test, and paint bleeding test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Definitions, methods of sampling and of testing, *see* 502.2, 505.0, 505.30; other tar fillers, *see* 505.15.

505.4 BITUMINOUS SURFACE TREATMENTS

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 34Yb; 1943. Bituminous Coating of Steel Surfaces (waterfront and underground service—pipe, tanks, floating equipment, bulkheads, piers, etc.).

References.—Bituminous macadam and bituminous concrete pavements, *see* 518.34; asphalt pavements, *see* 518.37.

506. OZOKERITE AND OTHER MINERAL WAXES

U. S. Gov., Navy Dept. Specification 52W3b; 1943. Wax; Ceresin, Yellow, Domestic.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 2-97; 1936. Wax (Saddler's and Stitching).

References.—Paraffin wax, *see* 504.54.

507. BITUMINOUS PRODUCTS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS116-44; 1944. Bituminized-Fibre Drain and Sewer Pipe. Covers uses, general requirements, dimensions, physical and chemical properties, and methods of testing of bituminized-fibre drain and sewer pipe (including 45- and 90-degree bends, straight couplings, and 5-degree angle couplings) in diameters ranging from 2 to 8 in. and in 5- and 8-ft. lengths.

509. MISCELLANEOUS OILS

U. S. Gov., Army Air Forces. Specification 3591; 1938. Oil; Ice-Preventive.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-80A; 1940. Oils; Tempering.

References.—Petroleum distillate thinner for paint, *see* 848.7.

510-519 STONE, SAND, AND CEMENTITIOUS MATERIAL

510. GENERAL ITEMS

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Permeability Tests. Method for determining green sand permeability, determination of permeability for shop control, determination of baked or dry sand permeability, and precautions to be observed in using permeability apparatus.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Standard Determination of Moisture.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Standard Fineness Test. Requirements as to classes of sands for test, selection and preparation of sample, equipment, and sizes of standard sieves.

American Foundrymen's Assn., Inc. Testing and Grading of Sands and Clays, 1938. Terms Used in Foundry Sand Work. Cover a variety of terms which relate to materials, tests, and properties used in foundry sand work, with their definitions.

American Society for Testing Materials, D 2-33; 1933. Method of Test for Abrasion of Rock by Use of the Deval Machine. Similar in most respects to the Deval abrasion test of French School of Roads and Bridges; dimensions and design of machine, sieve, test sample, and procedure for determining the coefficient of wear.

American Society for Testing Materials, D 3-18; 1918. American Assn. of State Highway Officials, T5-35. American Standards Assn., A5-1930. Method of Test for Toughness of Rock. Procedure for determining the toughness of rock, including requirements on apparatus, sampling, test specimens, test procedure, and report.

American Society for Testing Materials, D 8-33; 1933. Definitions of Terms Relating to Materials for Roads and Pavements. Covers bituminous materials such as emulsion, cut-back, asphalts, coal tar and pitch, terms relating to tests, nonbituminous materials, etc.

American Society for Testing Materials, E 4-36; 1936. American Assn. of State Highway Officials, T 67-42. Methods of Verification of Testing Machines. Includes definitions, methods of verifying machines that measure load by standard weights, by proving levers, by elastic calibration device, and by comparison method; test specimen, procedure, permissible variations, interval between verifications and reports.

American Society for Testing Materials, E 6-36; 1936. Definitions of Terms Relating to Methods of Testing. Covers stress, strain, elastic limit, field strength, tensile strength, compressive strength, and modulus of elasticity.

American Society for Testing Materials, E 12-27; 1927. American Assn. of State Highway Officials, M 132-42. Definitions of Terms Relating to Specific Gravity. Defines absolute specific gravity of solids and liquids, specific gravity, apparent specific gravity of solids, and bulk specific gravity of solids.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-1A; 1927. Rock; Toughness of, Standard Test.

511. STONE AND STONE MANUFACTURES

511.0 GENERAL ITEMS

American Society for Testing Materials, C 97-36; 1936. Methods of Test for Absorption and Apparent Specific Gravity of Natural Building Stone. Procedures for determining absorption by weight or by volume, and for the apparent specific gravity by weight of specified sample in water.

American Society for Testing Materials, C 99-36; 1936. Method of Flexure Testing of Natural Building Stone (Determination of Modulus of Rupture). Method of selecting test specimen, apparatus required, conditioning and measuring specimen, and procedure for test.

American Society for Testing Materials, C 100-36; 1936. Method of Test for Modulus of Elasticity of Natural Building Stone. Covers apparatus, the determination of elasticity in flexure and in compression, selection of test specimen, conditioning and measuring specimen, and outlines procedure for tests.

American Society for Testing Materials, C 102-36; 1936. Method of Shear Testing of Natural Building Stone. For determining the shearing strength of stone by use of modified Johnson shear tool or the Dutton punching shear device and standard testing machine, with details for both types. Selection of test specimen, conditioning and marking specimen, and outline of procedure for tests.

American Society for Testing Materials, C 170-41T; 1941. Tentative Method of Test for Compressive Strength of Natural Building Stone. Sampling, apparatus, test specimens, conditioning, procedure, calculations, report, and explanatory notes.

511.1 GRANITE

National Building Granite Quarries Assn., Inc. Granite in Architecture. Covers granite specifications, standard cut granite work, granite veneer, color classification, standard finishes, bonded construction, machine process work, and processing information.

References.—Definitions, methods of sampling and of testing, *see* 500, 510; granite curb, *see* 518.63; stone block, *see* 511.71; riprap, *see* 511.72; ashlar stone, rubble stone, riprap stone, *see* 511.9.

511.2 LIMESTONE AND DOLOMITE

American Ceramic Society. Journal of A.C.S. for June 1928. National Bureau of Standards. Circular 118. Adopted by A.C.S. in 1924. Limestone, Quicklime, and Hydrated Lime. Use of lime in manufacture of glass, definitions; requirements on chemical composition of nonvolatile portion of limestone, quicklime, or hydrated lime; fineness, methods of sampling and testing.

American Society for Testing Materials, C 25-44; 1944. Methods of Chemical Analysis of Limestone, Quicklime, and Hydrated Lime. Covers scope, analysis, special solution required, insoluble matter, silicon dioxide, iron and aluminum oxides, total iron, calcium oxide, strontium oxide, magnesium oxide, loss on ignition, mechanical moisture, carbon dioxide, sulfur trioxide, total sulfur, phosphorus, manganese, ferrous iron, available lime index, and appendix.

Indiana Limestone Institute. Indiana Limestone, 1940. For analysis of buff and gray stone, average weight, physical properties, definitions of all 11 grades as to fineness of grain, allowable variations in density, color and texture, permissible streaks, seams, pit holes, etc. Surface finishes and special uses.

Technical Assn. of the Pulp and Paper Industry. Analysis of Limestone, Standard T 618 m-44; 1944. For use in tower system of making bisulphite cooking acid from either high-calcium or high-magnesium limestone. Covers sampling, loss on ignition, silica and insoluble matter, iron oxide and alumina, lime, and magnesia.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Limestone, Argillaceous, Sample No.1a; and Limestone, Dolomitic, Sample No.88. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry or by others as a comparison standard for checking the accuracy of analysis of similar materials.

References.—Definitions, methods of sampling and of testing, *see* 500, 510; stone block, *see* 511.71; riprap, *see* 511.72; ashlar, rubble, and riprap stone, *see* 511.9.

511.3 MARBLE, TERRAZZO, AND MOSAICS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Marble and Tile Work. Gives requirements for terrazzo (monolithic and tile).

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Marble and Tile Work. Gives requirements for thicknesses, setting and anchoring, finish, joints, supports, floors, borders, and beds.

National Assn. of Marble Dealers. Interior Marble Work, 1926. Explanatory of the material a specification for interior marble work should contain, includes grouping of marbles according to properties for finishing, kinds of finish and where used, standard thicknesses for marble for different applications, reccmmended details and methods of construction, 42 plates illustrating typical installations.

National Terrazzo and Mosaic Assn. Divider Strip Location and Data. Covers the purpose of dividers, floated type of terrazzo floor, pattern work, carry a line division through, locate dividers at critical points, panel size, wall base, borders, wainscots, base beads and shelf type strips, grounded grills, sizes, materials, anchorage features, and proper use and location of dividers.

National Terrazzo and Mosaic Assn. Technical Data and Specifications for Terrazzo and Mosaic Work, 1939. Specifications for Mosaics. Marble mosaic shall be prepared mounted on paper in the mosaic shop. Gives requirements for concrete foundation, setting, grouting, finishing, and glass mosaic.

National Terrazzo and Mosaic Assn. Technical Data and Specifications for Terrazzo and Mosaic Work, 1939. Specifications for Terrazzo Work. Gives requirements for underbed, strips, terrazzo mix, installation, curing, surfacing, finishing, warning, nonslip floors, bases, stairs, wainscots, and partitions.

National Terrazzo and Mosaic Assn. Terrazzo Maintenance. Covers physical characteristics, selection of methods and selection of materials, filler or seal, special treatment, scrubbing, cleaning, maintenance, and caution.

Portland Cement Assn. Concrete Floor Finishes, 1938. Includes specifications for construction of terrazzo floors; requirements for base slab, samples, aggregates, color pigments, mixtures, placing, curing, machine rubbing, cleaning, and for nonslip terrazzo, with illustrations of various color combinations.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 11Yc; 1939. Marble and Tile Work.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 23Yb; 1934. Terrazzo.

References.—Definitions, methods of sampling and of testing, *see* 500, 510; electrical panels and switchboards, *see* 714.4; telephone switchboards, *see* 718.22; fuse blocks, *see* 714.22; switches and switch bases, *see* 714.52; cut-out bases, *see* 714.22.

511.4 SANDSTONE

References.—Definitions, methods of sampling and of testing, *see* 500, 510: stone block, *see* 511.71; riprap, *see* 511.72; ashlar, riprap, and rubble stone, *see* 511.9; sandstone curb, *see* 518.63.

511.5 SLATE

511.50 General Items

American Society for Testing Materials, C 119-27; 1927. Definition of the Term "Slate."

American Society for Testing Materials, C 120-31; 1931. Methods of Flexure Testing of Slate, Modulus of Rupture, Modulus of Elasticity. Requirements for structural or electrical slate and for roofing slate specimen; dimensions of knife-edges supporting specimen, sensitivity of test machine, conditioning and measuring specimen, and outline of procedure for tests.

American Society for Testing Materials, C 121-31; 1931. Method of Test for Water Absorption of Slate. Gives requirements for care in preparing specimens for test; for drying, weighing, and saturating specimen; and form of report.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP477; 1932. Physical Properties and Weathering Characteristics of Slate. Covers results of laboratory studies on commercial slates in this country and gives a brief description of general characteristics and uses of slates.

511.51 Blackboard Slate

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R15-35; 1935. Blackboard Slate. This recommendation covers sizes, finish, and thickness of blackboard slate. Recommended dimensions are given for blackboard slabs, location of slab joints in covering wall spaces, and dimensions and clear writing surfaces for portable or small blackboards—bulletin boards, school slates, kitchen slates, score-card slates, and memorandum slates. Initiated by National Slate Assn.

References.—Definitions, methods of sampling and of testing, *see* 511.50.

511.52 Building Slate and Slate Plumbing Fixtures

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Slate Roofing. Gives requirements for materials, application, sheet metal work, and guarantee.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R13-28; 1928. Structural Slate (for Plumbing and Sanitary Purposes). This recommendation establishes a schedule of dimensions, sizes, and nomenclature of structural slate for plumbing and sanitary purposes. It covers sizes and dimensions of slate laundry tubs, sinks, slop hoppers, shower stalls, toilet inclosures, and urinals. Initiated by the National Slate Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R14-28; 1928. Roofing Slate. This recommendation establishes a schedule of stock sizes and dimensions of slate shingles for sloping roofs and for flat roofs. It gives also a recommended color and dimension nomenclature. Initiated by National Slate Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS6; 1938. Survey of Roofing Materials in the Southeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Southeastern States is described. Detailed studies of roofing materials in Greensboro, N. C.; Columbia, S. C.; Savannah and Atlanta, Ga.; Jacksonville and Orlando, Fla.; Birmingham, Ala.; Knoxville, Tenn.; and Charleston, W. Va., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 2,500 miles of highway, is included. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS29; 1939. Survey of Roofing Materials in the Northeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Northeastern States is described, with numerous comparative references to a similar survey in the Southeastern States. Detailed studies of roofing materials in Wilmington, Del.; Philadelphia, Pa.; New Haven, Conn.; Boston, Mass.; Manchester, N. H.; Portland, Maine; Rutland, Vt.; and Albany and Syracuse, N. Y., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 1,600 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 21,000 rural and small-town dwellings along 4,000 miles of highway in 20 Eastern States. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS75; 1941. Survey of Roofing Materials in the North Central States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the North Central States is described, with numerous references to similar surveys made previously in the Southeastern and Northeastern States. Detailed studies of roofing materials in Pittsburgh, Pa.; Cincinnati and Toledo, Ohio; Grand Rapids and Lansing, Mich.; Chicago, Ill.; Milwaukee, Wis.; St. Paul, Minn.; Bismarck, N. Dak.; Sioux Falls, S. Dak.; Omaha, Nebr.; Kansas City, Moberly, and St. Louis, Mo.; and Indianapolis, Ind., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 8,000 rural and small-town dwellings, along approximately 3,000 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 29,000 rural and small-town dwellings along 7,000 miles of highway in the 32 states covered by the three surveys. Forty-eight photographs, illustrating type of weathering of roofing materials, and features of design and construction of roofs, are shown.

U. S. Gov., Federal Specification SS-S-451; 1932. Slate; Roofing. Covers one type and three grades—A, B, and C. Gives detail requirements for color, strength, absorption, and acid resistance; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions, methods of sampling and of testing, *see* 511.50; roofing construction, *see* 518.57.

511.53 Slate for Electrical Purposes

American Society for Testing Materials, D 273-40; 1940. Methods of Test for Conducting Paths in Electrical Slate. Includes simple spark coil test for routine factory or quarry use where numerical readings are not necessary, and procedure for measuring the leakage current when subjected to high voltage of commercial frequency for laboratory or where large volume of slate is to be tested. Description of apparatus, test specimen, and procedure.

References.—Definitions, methods of sampling and of testing, *see* 511.50; electrical panels and switchboards, *see* 714.4; telephone switchboards, *see* 718.22; fuse blocks, *see* 714.22; switches and switch bases, *see* 714.52; cut-out bases, *see* 714.22; methods of testing insulating qualities, *see* 719.50.

511.6 SOAPSTONE

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes requirements for cast iron, soapstone, and concrete laundry trays with and without backs. Covers trays of single and double compartments for cast iron; single, double, and triple compartments for soapstone; and double compartments for concrete. Includes also requirements for supports and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.), changed requirements for metals and finishes, standard materials, and illustrations; selections and air gaps.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes requirements for sinks made of soapstone including supports, trimmings, and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.), changed requirements for metals and finishes, standard materials, and illustrations; selections and air gaps.

511.7 ROCK AND STONE FOR ROAD BUILDING

511.70 General Items

American Society for Testing Materials, D 3-18; 1918. American Assn. of State Highway Officials, T5-35. American Standards Assn., A5-1930. Method of Test for Toughness of Rock. Procedure for determining the toughness of rock, including requirements on apparatus, sampling, test specimens, test procedure, and report.

American Society for Testing Materials, D 75-42T; 1942. American Assn. of State Highway Officials, T2-42. Tentative Methods of Sampling Stone, Slag, Gravel, Sand, and Stone Block for Use as Highway Materials. For preliminary investigation of sources of supply, acceptance or rejection of source of supply, and inspection of shipments of materials. Includes stone from ledges or quarries, field stone and boulders, sand and gravel from commercial or noncommercial deposits, bank run sand and gravel, stone block, and miscellaneous materials; requirements for samples, size and marking of samples and records.

511.71 Stone and Granite Blocks

American Society for Testing Materials, D 59-39; 1939. Granite Block for Pavements. For general quality of block, percentage of wear and toughness using A.S.T.M. methods D 2 and D 3 of testing, size, dressing, and inspection.

American Society for Testing Materials, D 131-39; 1939. Recut Granite Block for Pavements. Covers grain size, uniformity of quality and texture, percentage of wear and toughness by tests using A.S.T.M. methods, standard dimensions, dressing, and inspection.

American Society for Testing Materials, D 132-39; 1939. Granite Block for Durax Pavements. General quality of block, percentage of wear and toughness determined by A.S.T.M. methods, limiting dimensions, dressing, and inspection.

U. S. Gov., Federal Specification SS-G-651; 1931. Granite Blocks, Recut Granite, and Durax Granite Pavements. Gives requirements for physical properties and dimensions, methods of sampling and testing, and requirements for packing and marking.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70; granite, limestone, sandstone, *see* 511.1, 511.2, 511.4; cast stone, *see* 516.4; stone block pavements, *see* 518.36.

511.72 Riprap

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Loose Riprap.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70; riprap, *see* 511.9; granite, limestone, sandstone, *see* 511.1, 511.2, 511.4; retaining and head walls, *see* 518.66; rubble and ashlar masonry, *see* 518.81, 518.82.

511.73 Railway Ballast

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Prepared Stone, Slag, and Gravel Ballast. Covers the requirements for grading and other significant physical properties of mineral aggregates for prepared ballast. Gives general requirements, quality requirements, grading requirements, handling, inspection, testing, methods of test, and measurement.

National Sand and Gravel Assn. Circular 23; 1944. Specifications for Prepared Stone, Slag, and Gravel Ballast. Covers scope, general requirements, quality requirements, grading requirements, handling, inspection, testing, methods of test, and measurement. Reprint from the copyrighted proceedings American Railway Engineering Assn.

U. S. Gov., Federal Specification SS-C-72; 1942. Crushed-Stone, Crushed-Slag, and Gravel, (for) Railroad Ballast. Covers four types and sizes. Gives requirements for material, resistance to abrasion, weight of slag, soundness, deleterious substances, and grading; and methods of sampling and tests.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70, 512.10; gravel, sand, broken stone, slag, *see* 512.11, 512.12, 512.15, 512.2.

511.9 MISCELLANEOUS STONE AND STONE MANUFACTURES

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70.

512. SAND, GRAVEL, BROKEN STONE, SLAG

512.1 SAND, GRAVEL, BROKEN STONE

512.10 General Items

American Assn. of State Highway Officials, M56-42. Standard Specifications for Materials for Stabilized Base Course. Covers the quality and size of sand-clay mixtures; gravel, stone, or slag screenings; or sand, crusher run course aggregate consisting of gravel, crushed stone, or slag combined with soil mortar or any combination of these materials for use in the construction of a stabilized base course. Gives types, general requirements, physical properties, moisture content, admixtures, and methods of sampling and testing.

American Assn. of State Highway Officials, M61-42. Standard Specifications for Materials for Stabilized Surface Course. Gives scope, types, general requirements, detail requirements, moisture content, admixtures, and methods of testing.

American Assn. of State Highway Officials, T3-35. Standard Method of Test for Abrasion of Stone and Slag by Use of the Deval Machine. Gives description of machine and detailed procedure for making the test.

American Assn. of State Highway Officials, T10-35. Standard Method of Test for Percentage of Shale in Aggregate. Gives method for the separation of shale and other pieces having low specific gravity from concrete aggregate by using a solution of a satisfactory liquid having a specific gravity of approximately 1.95.

American Assn. of State Highway Officials, T30-37. Standard Method of Test for Mechanical Analysis of Extracted Aggregates. For mineral aggregate left after extraction of bituminous materials. Gives procedure for drying and screening.

American Assn. of State Highway Officials, T36-24. Standard Method of Test for Sampling Mineral Filler. Gives method of sampling for mineral filler which is the same as for Portland cement received in carload lots.

American Assn. of State Highway Officials, T101-42. Standard Methods of Determining Swell Characteristics of Aggregates When Mixed With Bituminous Materials. These methods provide for the determination of the swell characteristics of dense-graded bituminous mixtures and aggregates used in such mixtures. Gives apparatus, bituminous binder, procedure, measuring, immersion, calculation of results, and report.

American Assn. of State Highway Officials, T103-42. Standard Method of Test for Soundness of Aggregates by Freezing and Thawing. Gives scope, apparatus, samples, preparation of test sample, method of exposure, cycles, measurement of disintegration, quantitative examination, qualitative examination, and report.

American Assn. of State Highway Officials, T109-42. Standard Method of Test for Settlement Ratio of Mineral Matter in Bituminous Filler. This method of test is used as a measure of the rate at which mineral matter in mixtures of asphalt and mineral matter will settle when maintained without agitation at a temperature of 325° F. Gives apparatus, sample, procedure, and results.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Durability Tests. Describes several methods for measuring the durability of life of sands and clays.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Dye Absorption Qualities of Molding Sand. Gives requirements as to the selection and preparation of sample, the equipment and reagents required, and the procedure to be followed in making the test.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Recommended Method of Determining Sea-Coal in Foundry Sand. Gives requirements relative to method of sea-coal analysis, foundry sand analysis, and application to heap sand or facing analysis.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Sampling Foundry Sands and Clays. Describes four methods of sampling, namely—routine method for samples of testing foundry sands as shipped or delivered; sampling method when accuracy is desired in case of dispute; sand as sampled in the foundry for routine testing of sand heaps or system sands; and clays, including bentonites, as shipped or delivered.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Sintering Point of Sand. Describes a standard method for determining the sintering point of foundry sand.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Standard Preparation of Samples To Be Tested. Includes sampling of new sands, range of moisture content, preparation of samples, and plant control check.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Standard Form and Preparation of Test Specimen. The standard specimen of sand is used in determining permeability; tensile, shear, and compression strengths; deformations and sintering point of foundry sands.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Strength of Baked Cores. Gives descriptions of the methods for testing the baked strength of cores and mixtures. Two methods have been approved as tentative standard, namely—tensile test and transverse strength test.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Strength Tests. Includes standard methods for determining green compression strength, dry compression strength, green sand shear strength, bar strength of green sand, tensile strength, etc.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Tentative Standard Method of Testing Core Binders. Includes requirements for selection and preparation of sample, equipment to be used, procedure to be followed, and testing for physical properties.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Tentative Standard Determination of Permeability of Baked Cores; Gives definition and requirements as to selection and preparation of samples, test specimens, equipment, and procedure to be followed.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Tentative Standard Method for Determining Green Sand Mold Surface Hardness. Gives requirements as to equipment to be used, controlling specifications, and instrument calibration.

American Foundrymen's Assn., Inc. Testing and Grading Foundry sands and Clays, 1938. Tentative

Standard Specifications for Testing Oven Used in Baking Core Test Specimens. Gives requirements as to the type of oven to be used relative to heat, temperature control, shelf construction, circulating fan, number of vents, and openings.

American Public Works Assn. Sewers, J1-38; 1938. Includes concrete aggregates such as sand, gravel, crushed stone, or other inert materials having hard, strong, durable pieces free from organic impurities. Also sand for preparation of masonry mortar and for tests using A.S.T.M. methods.

American Society for Testing Materials, C 29-42; 1942. American Assn. of State Highway Officials, T 19-42. Method of Test for Unit Weight of Aggregate. Covers necessary apparatus, condition of sample, calibration of measure, compact weight determination by rodding procedure and jigging procedure, and loose weight determination.

American Society for Testing Materials, C 30-37; 1937. American Assn. of State Highway Officials, T 20-42. American Standards Assn., A 19-1937. Method of Test for Voids in Aggregate for Concrete. Formula for determination of percentage of voids with definitions of terms.

American Society for Testing Materials, C 40-33; 1933. Method of Test for Organic Impurities in Sands for Concrete. For approximate determination of the presence of injurious organic compounds in natural sands. Gives size of sample necessary, reference standard color solution, method of test, and comparison of color value.

American Society for Testing Materials, C 58-28; 1928. Definition of the Term "Sand."

American Society for Testing Materials, C 58-28T; 1928. Tentative Definition of the Term "Aggregate."

American Society for Testing Materials, C 88-44T; 1944. American Assn. of State Highway Officials, T 104-44. Tentative Method of Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate. The procedure to be followed in testing aggregates to determine their resistance to disintegration by saturated solutions of sodium sulfate or magnesium sulfate. Covers apparatus, special solutions required, samples, preparation of test sample, procedure, quantitative examination, qualitative examination, and report.

American Society for Testing Materials, C 117-37; 1937. American Assn. of State Highway Officials, T 11-42. American Standards Assn., A 37.4-1943. Method of Test for Amount of Material Finer Than No. 200 Sieve in Aggregates. Describes sieves and container for test sample and procedure for washing and weighing screened material to determine the loss of matter finer than No. 200 sieve.

American Society for Testing Materials, C 125-44; 1944. Definitions of Terms Relating to Concrete and Concrete Aggregates. Defines admixture, blast-furnace slag, crushed gravel, crushed stone, elongated piece, fineness modulus, flat piece, gravel, and water-cement ratio.

American Society for Testing Materials, C 127-42; 1942. American Assn. of State Highway Officials, T 85-42. American Standards Assn., A 37.5-1943. Method of Test for Specific Gravity and Absorption of Coarse Aggregate. For determining bulk and apparent specific gravity and absorption, after 24 hr. in water at room temperature, of coarse aggregate. Covers necessary apparatus, sampling, method of procedure, and the derivation of bulk specific gravity, apparent specific gravity, and percentage of absorption.

American Society for Testing Materials, C 128-42; 1942. American Assn. of State Highway Officials, T 84-42. American Standards Assn., A 37.6-1943. Method of Test for Specific Gravity and Absorption of Fine Aggregate. For determining bulk specific gravity, apparent specific gravity, and absorption, after 24 hr. in water at room temperature. Describes apparatus, preparation of sample, outlines procedure, and calculations.

American Society for Testing Materials, C 131-44; 1944. American Standards Assn., A 37.7-1944. American Assn. of State Highway Officials, T 96-44. Method of Test for Abrasion of Coarse Aggregate by Use of the Los Angeles Machine. For testing crushed rock, crushed slag, uncrushed gravel, and crushed gravel for resistance to abrasion. Covers apparatus, abrasive charge, test sample, procedure, and calculation.

American Society for Testing Materials, C 136-39; 1939. American Assn. of State Highway Officials, T 27-42. American Standards Assn., A 37.8-1943. Method of Test for Sieve Analysis of Fine and Coarse Aggregates. For determination of particle size distribution of fine and coarse aggregates but not for aggregates recovered from bituminous mixtures or for mineral fillers. Describes sieves, balances, and selection of samples, and outlines procedure for analysis.

American Society for Testing Materials, C 142-39; 1939. American Assn. of State Highway Officials, T 112-42. Method of Test for Clay Lumps in Aggregates. For approximate determination of clay lumps in routine examination of aggregates. Covers apparatus, test samples, and outlines procedure for test.

American Society for Testing Materials, D 2-33; 1933. Method of Test for Abrasion of Rock by Use of the Deval Machine. Similar in most respects to the Deval abrasion test of French School of Roads and Bridges; dimensions and design of machine, sieve, test sample, and procedure for determining the coefficient of wear.

American Society for Testing Materials, D 3-18; 1918. American Assn. of State Highway Officials, T5-35. American Standards Assn., A5-1930. Method of Test for Toughness of Rock. Procedure for determining the toughness of rock, including requirements on apparatus, sampling, test specimens, test procedure, and report.

American Society for Testing Materials, D 75-42T; 1942. American Assn. of State Highway Officials, T2-42. Tentative Methods of Sampling Stone, Slag, Gravel, Sand, and Stone Block for Use as Highway Materials. For preliminary investigation of sources of supply, acceptance or rejection of source of supply, and inspection of shipments of materials. Includes stone from ledges or quarries, field stone and boulders, sand and gravel from commercial or noncommercial deposits, bank run sand and gravel, stone block, and miscellaneous materials; requirements for samples, size and marking of samples, and records.

American Society for Testing Materials, D 289-42T; 1942. Tentative Method of Test for Abrasion of Gravel by Use of the Deval Machine.

American Society for Testing Materials, D 556-40T; 1940. Tentative Specifications for Materials for Stabilized Base Course. Covers the quality and size of sand-clay mixtures, gravel, stone or slag screenings, sand, crusher-run coarse aggregate consisting of gravel, crushed stone, or slag combined with soil mortar, or any combination thereof for construction of a stabilized base course. General requirements, sieve analysis, liquid limit, plasticity index, moisture content, admixtures, and methods of testing.

American Society for Testing Materials, D 557-40 T; 1940. Tentative Specifications for Materials for Stabilized Surface Course. Covers the quality and size of sand-clay mixtures; gravel, stone, or slag screenings; sand, crusher-run aggregate, or combinations thereof. Gives general requirements, sieve analysis, liquid limit, plasticity index, moisture content, admixtures, and methods of testing.

National Sand and Gravel Assn. Circular 15; 1937. Studies of Sodium and Magnesium Sulfate Soundness Tests. These methods provide for the alternate soaking and drying of aggregates under controlled conditions to secure data relative to the resistance of aggregates to weathering and other factors causing disintegration. Covers scope, materials and test methods, discussion of tests, and conclusion. Reprinted from the copyrighted proceedings of the A.S.T.M.

National Sand and Gravel Assn. Circular 16. The Effect of Deleterious Materials in Aggregate for Concrete. A general discussion of the harmful effects of unsound particles prevalent in certain gravels.

National Sand and Gravel Assn. Circular 17. Some Engineering Research Problems of the Sand and Gravel Industry. Outlines in general terms some of the important engineering research problems which confront the sand and gravel industry. Covers sand and gravel in bituminous mixtures, suggested bituminous-mixture researches, sand and gravel in concrete, soundness of aggregates, deleterious particles, standardization of specifications, production problems, miscellaneous problems, and conclusion.

National Sand and Gravel Assn. Circular 18; 1938. The Relation Between Los Angeles Abrasion Test Results and the Service Records of Coarse Aggregates. It appears that there is a definite relation between the loss in the Los Angeles test and the service record of materials used in concrete, bituminous construction, and surface treatment. Covers the subject by a general discussion, gives tables of comparison between Los Angeles test result and service record by the highway departments of several states, and gives figures showing percentage of wear. Los Angeles test from data furnished by the highway departments of several states. Reprint from the proceedings of the Highway Research Board.

National Sand and Gravel Assn. Circular 20; 1940. Degradation of Aggregates Under Road Rollers. Reports data on the degradation produced by 5-ton and 10-ton rollers in compacting typical uncoated surface treatment aggregates both on a bituminous mat and on a concrete base. Several gradings of six limestones, four crushed and four uncrushed gravels, and one blast-furnace slag were tested. Data are also reported showing the relationship between degradation of aggregates under rollers and losses obtained in the Los Angeles tests. Covers description of equipment, roller test procedure, roller test results, Los Angeles test results, and conclusions. Reprint from the copyrighted proceedings of the A.S.T.M.

National Sand and Gravel Assn. Circular 22; 1943. Soundness of Aggregates. Indications of unsound aggregates in concrete exposed to the elements fall into four broad classifications which may be described as pitting, spalling, surface scaling, and map cracking. Discusses these four classifications, methods of testing, indications from exposed concrete, indications of soundness tests, and conclusions. Reprint from the copyrighted report published by the A.S.T.M.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Glass Sand. Covers definition, constants, solubility, occurrence, derivations, purity, grades, specifications, substitutes, containers, shipping regulations, uses, and ordering instructions.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Glass Sand, Sample 81. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes requirements for materials for stone or gravel sheathing; spot subgrade reinforcement; selected borrow base course; stabilized sail base course; gravel base course; crushed gravel or crushed stone base course; telford base course; sledged stone base course; dry choked stone or slag base course; waterbound macadam base course; reconstructed stone or gravel base course; bituminous macadam base course; hot bituminous base course; selected borrow surface course; gravel surface course; crushed gravel or crushed stone surface course; class B-1 and class C-1 dense graded road-mix surface courses; class B-2, dense graded plant-mix surface course; class C-2, open graded road-mix surface course; class D, type D-1, mosaic macadam pavement; class D, type D-2, three application macadam pavement; class E-2, type EM, four application macadam pavement; class F, type F-1, dense graded plant-mix surface course; and class F, type F-2, open graded plant-mix surface course.

512.11 Gravel

American Assn. of State Highway Officials, M62-42. Standard Specifications for Crushed Stone, Crushed

Slag, and Crushed Gravel for Dense-Graded Bituminous Road and Plant-Mix Surface Course. Gives scope, general requirements, physical properties, and methods of testing.

American Assn. of State Highway Officials, M63-42. Standard Specifications for Crushed Stone, Crushed Slag, and Crushed Gravel for Open-Graded Bituminous Road-Mix Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M80-42. Standard Specifications for Coarse Aggregate for Portland Cement Concrete. Gives scope, general requirements, deleterious substances, percentage of wear, weight per cubic foot of slag, soundness, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, T4-35. Standard Method of Test for Abrasion of Gravel by Use of the Deval Machine. Gives requirements on screening of sample and preparation according to one of five standard grade classes, size of sample, duration of test in Deval abrasion testing machine, speed of machine, measurement of loss by abrasion; for gravel containing no crushed pieces and for gravel containing crushed pieces.

American Society for Testing Materials, C 131-44; 1944. American Standards Assn., A 37.7-1944. American Assn. of State Highway Officials, T 96-44. Method of Test for Abrasion of Coarse Aggregate by Use of the Los Angeles Machine. For testing crushed rock, crushed slag, uncrushed gravel, and crushed gravel for resistance to abrasion. Covers apparatus, abrasive charge, test sample, procedure, and calculation.

American Society for Testing Materials, D 692-42T; 1942. Tentative Specifications for Crushed Stone, Crushed Slag, and Gravel for Bituminous Concrete Base and Surface Courses of Pavements. Includes requirements for sieve analysis and for tests using A.S.T.M. methods.

American Society for Testing Materials, D 694-44; 1944. Crushed Stone, Crushed Slag, and Gravel for Water-Bound Base and Surface Courses of Pavements. Cover general characteristics, physical requirements, sizes, sieve analysis, and methods of sampling and testing using A.S.T.M. methods.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-7A; 1933. Roofing Material; Surfacing, Built-Up, Bituminous.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70, 512.10; railway ballast, *see* 511.73; fine and coarse aggregate, *see* 512.13, 512.14; gravel for concrete, concrete bricks and blocks, concrete sidewalks, concrete poles and posts, *see* 516.3, 516.4, 516.5, 516.9; gravel for road construction and pavement, *see* 518.1, 518.2, 518.3; gravel for bridges and piling, *see* 518.4; gravel for buildings and parts of buildings, *see* 518.5; gravel for drainage structures, concrete drain and sewer pipe, *see* 518.6; gravel for tanks and concrete masonry, *see* 518.7, 518.8.

512.12 Sand

American Assn. of State Highway Officials, M29-42. Standard Specifications for Sand for Bituminous Mixtures. For use in bituminous pavements, bituminous mortars, bituminous filler or mastics. Gives general requirements, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M45-42. Standard Specifications for Mortar Sand. Gives scope, general requirements, organic impurities, mortar strength, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, T21-42. Standard Method of Test for Organic Impurities in Sands for Concrete. Covers the procedure for an approximate determination of the presence of injurious organic compounds in natural sand which are to be used in cement mortar or concrete. Gives sample, reference standard color solution, procedure, and determination of color value.

American Ceramic Society. Journal of A.C.S. for June 1928. Tentative Method. Complete Sand Analysis, 1928. Preparation and dissolving of sample, method of determination of R_2O_3, CaO, MgO, and loss on ignition; determination of iron, zirconia, alumina, silica, and electrometer method for iron in glass sands.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Foundry Sand Grading Classifications. The classification factors are grain fineness number, grain fineness class, grain distribution numbers, clay content class, and grain shape class, with detailed information under each factor.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Standard Chemical Analysis of Foundry Sands. Includes preparation of sample, determination of water, total volatile matter, silica, iron, aluminum and titanium oxides, ferric oxide, titania, alumina, lime, magnesia, carbon dioxide, potassium and sodium oxides, and ferrous oxide.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Standard Testing Sand. Shall consist of washed and dried, rounded-grain, silica sand, having a maximum dye adsorption of 40. States percentage of sand which must pass through certain mesh sieves.

American Foundrymen's Assn., Inc. Testing and Grading Foundry Sands and Clays, 1938. Tentative Standard Procedure for Determining Bonding Power of Clays. Gives requirements as to the sand to be used, preparation of the test sample, and testing.

American Public Works Assn. Specification for Vitrified Brick Pavement, D1-36; 1936. Includes requirements for sand, stone or slag screenings, granulated slag, and crushed shells as to general quality and grading percentages in U. S. Standard Sieve Series. Adopted by National Paving Brick Assn.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Architectural Terra Cotta. Gives requirements for sand.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Brick Pavements and Floors. Gives requirements for sand for cushion and for cement grout filler.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads.

Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Brickwork. Gives requirements for sand for mortar.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Clay Hollow Tile. Gives requirements for sand.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Concrete Architectural Stone. Gives requirements for sand.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Sewers and Drainage. Gives requirements for sand for mortar for pipe joints.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Sheet Asphalt Pavements; Asphalt Block Pavements; and Asphalt Macadam Pavements. Gives requirements for sand for binder and wearing courses of sheet asphalt pavements.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Shotcrete. Gives requirements for grading of sand.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Stone Masonry and Cut Stone Work. Gives requirements for sand.

American Society for Testing Materials, C 35-39; 1939. Sand for Use in Plaster. Gives requirements for a fine granular material composed of hard, strong durable uncoated particles free from injurious amounts of saline, alkaline, organic, and other deleterious substances; sieve analysis; and tests in accordance with A.S.T.M. methods.

American Society for Testing Materials, C 58-28; 1928. Definition of the Term "Sand."

American Society for Testing Materials, C 123-44; 1944. American Assn. of State Highway Officials, T 113-44. Method of Test for Coal and Lignite in Sand. For approximate determination of coal, lignite, and other particles of low specific gravity in the routine laboratory examination of sands. Covers apparatus, procedure, and calculation.

American Society for Testing Materials, D 162-29; 1929. Sand for Sheet Asphalt and Bituminous Concrete Pavements. Includes general quality requirements, limiting percentages retained on and passing various screen sizes, sampling and testing in accordance with A.S.T.M. methods D 75, C 136.

Contracting Plasterers' International Assn. Standard Specification. Includes requirements for sand.

U. S. Gov., Federal Specification SS-M-51; 1931. Materials; (for) Cushion Course, Brick, Stone-Block, or Wood-Block Pavements (Sand, Slag, Limestone, Screenings, Etc.) Covers sand, granulated slag, slag screenings, and limestone screenings. Gives requirements for material and grading; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-S-51; 1934. Sand; (for) Cement-Mortar-Bed (for) Brick, Stone-Block, or Wood-Block Pavements. Covers one grade. Gives requirements for size and strength; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-S-61; 1931. Sand; (for) Grout-Filler, Brick and Stone-Block Pavements. Covers one grade. Gives requirements for size and strength; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-S-71a; 1942. Sand; (for Use in) Sheet-Asphalt or Bituminous-Concrete Pavements. Gives requirements for grading; and methods of sampling and testing.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 87-4; 1941. Filter; Sand for Water Purification Units.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70, 512.10; sand for mineral fillers, *see* 512.16; fine aggregate, *see* 512.13; sand for plasters, *see* 514.3, 514.4, 514.5, 514.6; sand for stucco, concrete and mortar, concrete bricks and blocks, concrete sidewalks, concrete poles and posts, *see* 516.2, 516.3, 516.4, 516.5, 516.9; sand for road construction and pavement, *see* 518.1, 518.2, 518.3; sand for bridges and piling, *see* 518.4; sand for buildings, *see* 518.5; sand for drainage structures, concrete drain and sewer pipe, *see* 518.6; sand for tanks and concrete masonry, *see* 518.7, 518.8; abrasive sand, *see* 541.4; silica mold wash for foundries, *see* 593.

512.13 Fine Aggregate

American Assn. of State Highway Officials, M6-42. Standard Specification for Fine Aggregate for Portland Cement Concrete. Gives scope, general requirements, deleterious substances, soundness, organic impurities, structural strength, grading, uniformity of grading, and methods of sampling and testing.

American Public Works Assn. Specification for Concrete Sidewalks, C1-36; 1936. Includes requirements for fine aggregates consisting of sand or other approved inert materials having hard, strong, durable particles, with maximum allowable percentages of deleterious substances, including coal, clay lumps, shale, mica, soft fragments, organic matter, and to show a practically colorless solution. Also includes sieve analysis, and strength of standard sample as compared with sample prepared from Ottawa sand, and requirements for coarse aggregates.

American Public Works Assn. Specification for Vitrified Brick Pavement, D1-36; 1936. Includes requirements for fine aggregate composed of sand, stone, or slag screenings, granulated slag, or crushed shells consisting of clean, hard, strong, durable, uncoated particles graded from coarse to fine, with coarse particles predominating, free from lumps of clay and all organic matter, and sieve analysis. Also for test of sample prepared with cement as to strength compared with specimen prepared from standard Ottawa sand. Adopted by National Paving Brick Assn.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for

Buildings for Railroad Purposes: Asphalt Mastic Floors; and Asphalt Block Floors. Gives requirements for aggregate for slab and mineral aggregate added in field.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Concrete and Reinforced Concrete Railroad Bridges and Other Structures. Gives requirements for fine aggregate—material, grading, uniformity, organic impurities, and methods of sampling and testing. Emergency Provisions Adopted Feb. 3, 1943, modified above specifications in order to use local materials to conserve transportation.

American Society for Testing Materials, C 33-44; 1944. Concrete Aggregates. Covers fine and coarse aggregates suitable for use in concrete. Gives general characteristics, deleterious substances, grading, mortar strength, and soundness for fine aggregate; general characteristics, deleterious substances, grading, weight of slag, and soundness for coarse aggregate; and methods of sampling and testing.

American Society for Testing Materials, C 70-44T; 1944. Tentative Method of Test for Surface Moisture in Fine Aggregate. Field procedure for determining the amount of surface moisture in fine aggregate by displacement in water. Covers apparatus, sample, procedure, and calculation.

American Society for Testing Materials, C 87-44; 1944. American Assn. of State Highway Officials, T 71-44. Method of Test for Structural Strength of Fine Aggregate Using Constant Water-Cement-Ratio Mortar. Covers scope, mortar, flow test, molding specimens, temperature, and capping specimens.

American Society for Testing Materials, C 128-42; 1942. American Assn. of State Highway Officials, T 84-42. American Standards Assn., A 37.6-1943. Method of Test for Specific Gravity and Absorption of Fine Aggregate. For determining bulk specific gravity, apparent specific gravity, and absorption, after 24 hr. in water at room temperature. Describes apparatus, preparation of sample, outlines procedure, and calculations.

American Society for Testing Materials, C 130-42; 1942. Lightweight Aggregates for Concrete. Covers pumice, lava, tufa, slag, burned clay, burned shale, certain cinders, or other material having strong, durable particles. Gives limits for deleterious substances, organic impurities, grading, unit weight, mortar strength, soundness, and tests in accordance with A.S.T.M. methods.

American Society for Testing Materials, C 136-39; 1939. American Assn. of State Highway Officials, T 27-42. American Standards Assn., A 37.8-1943. Method of Test for Sieve Analysis of Fine and Coarse Aggregates. For determination of particle size distribution of fine and coarse aggregates but not for aggregates recovered from bituminous mixtures or for mineral fillers. Describes sieves, balances, and selection of samples, and outlines procedure for analysis.

American Society for Testing Materials, C 144-44; 1944. Aggregate for Masonry Mortar. For a fine granular material composed of hard, strong, durable mineral particles which are free from injurious amounts of saline, alkaline, organic, or other deleterious substances. Covers grading, deleterious substances, mortar strength test, and methods of testing.

U. S. Gov., Federal Specification SS-A-281a; 1941. Amendment 1; 1942. Aggregate; (for) Portland-Cement Concrete. Covers two classes—(1) fine aggregate and (2) coarse aggregate; two grades—(A) for use in concrete structures in general and (B) for use only in concrete protected from the weather. Gives requirements for sizes, materials, grading, mortar strength, soundness, and resistance to abrasion; and methods of sampling, inspection, and tests.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 4Yd; 1939. Construction of Portland Cement Concrete Pavements. Includes requirements for fine aggregates.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 13Yc; 1935, and Addendum 1; 1942. Concrete Construction. Includes requirements for fine aggregate.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70, 512.10; gravel. sand, slag, *see* 512.11, 512.12, 512.2; fine aggregate for stucco, concrete, concrete bricks and blocks, concrete sidewalks, concrete poles and posts, *see* 516.2, 516.3, 516.4, 516.5, 516.9; fine aggregate for road construction, *see* 518.2, 518.3; fine aggregate for bridges and piling, *see* 518.4; fine aggregate for buildings, *see* 518.5; fine aggregate for drainage structures. concrete drain and sewer pipe, *see* 518.6; fine aggregate for tanks and concrete masonry, *see* 518.7, 518.8.

512.14 Coarse Aggregate

American Assn. of State Highway Officials, M43-42. Standard Specifications for Standard Sizes of Coarse Aggregate for Highway Construction. Gives scope, manufacture, standard sizes, and table showing standard sizes of coarse aggregate.

American Assn. of State Highway Officials, M80-42. Standard Specifications for Coarse Aggregate for Portland Cement Concrete. Gives scope, general requirements, deleterious substances, percentage of wear, weight per cubic foot of slag, soundness, grading, and methods of sampling and testing.

American Public Works Assn. Specification for Portland Cement Concrete Pavement, F1-39; 1939. For coarse aggregates this organization has adopted the A.S.T.M. specification C33, except for grading limits.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Macadam Pavements; and Cement Grouted Macadam Platforms, Floors, Pavements, and Pavement Bases. Gives requirements for gradation of coarse aggregates.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Concrete and Reinforced Concrete Railroad Bridges and Other Structures. Gives requirements for coarse aggregate—material, grading, resistance to abrasion, and methods of sampling and testing. Emergency Provision Adopted Feb. 3, 1943, modified above specification in order to use local materials to conserve transportation.

American Society for Testing Materials, C 33-44; 1944. Concrete Aggregates. Covers fine and coarse aggregates suitable for use in concrete. Gives general characteristics, deleterious substances, grading, mortar strength, and soundness for fine aggregate; general characteristics, deleterious substances, grading, weight of slag, and soundness for coarse aggregate; and methods of sampling and testing.

American Society for Testing Materials, C 127-42; 1942. American Assn. of State Highway Officials, T 85-42. American Standards Assn., A 37.5-1943. Method of Test for Specific Gravity and Absorption of Coarse Aggregate. For determining bulk and apparent specific gravity and absorption, after 24 hr. in water at room temperature, of coarse aggregate. Covers necessary apparatus, sampling, method of procedure, and the derivation of bulk specific gravity, apparent specific gravity, and percentage of absorption.

American Society for Testing Materials, C 130-42; 1942. Lightweight Aggregates for Concrete. Covers pumice, lava, tufa, slag, burned clay, burned shale, certain cinders, or other material having strong, durable particles. Gives limits for deleterious substances, organic impurities, grading, unit weight, mortar strength, soundness, and tests in accordance with A.S.T.M. methods.

American Society for Testing Materials, C 131-44; 1944. American Standards Assn., A 37.7-1944. American Assn. of State Highway Officials, T 96-44. Method of Test for Abrasion of Coarse Aggregate by Use of the Los Angeles Machine. For testing crushed rock, crushed slag, uncrushed gravel, and crushed gravel for resistance to abrasion. Covers apparatus, abrasive charge, test sample, procedure, and calculation.

American Society for Testing Materials, C 136-39; 1939. American Assn. of State Highway Officials, T 27-42. American Standards Assn., A 37.8-1943. Method of Test for Sieve Analysis of Fine and Coarse Aggregates. For determination of particle size distribution of fine and coarse aggregates, but not for aggregates recovered from bituminous mixtures or for mineral fillers. Describes sieves, balances, and selection of samples; and outlines procedure for analysis.

American Society for Testing Materials, D 448-42T; 1942. Tentative Specifications for Standard Sizes of Coarse Aggregate for Highway Construction. Cover standard size designations and maximum permissible ranges in mechanical analyses for standard sizes of coarse aggregate and screenings for use in the construction or maintenance of various types of highways and highway structures. Manufacture and standard sizes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R163-39; 1939. Coarse Aggregates (Crushed Stone, Gravel, and Slag). This recommendation establishes a simplified list of sizes of coarse aggregates and a table showing typical uses for sizes given in the list. Initiated by the National Crushed Stone Assn., National Sand and Gravel Assn., and National Slag Assn.

U. S. Gov., Federal Specification SS-A-281a; 1941. Amendment 1; 1942. Aggregate; (for) Portland-Cement Concrete. Covers two classes—(1) fine aggregate and (2) coarse aggregate; two grades—(A) for use in concrete structures in general and (B) for use only in concrete protected from the weather. Gives requirements for sizes, materials, grading, mortar strength, soundness, and resistance to abrasion; and methods of sampling, inspection, and tests.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 4Yd; 1939. Construction of Portland Cement Concrete Pavements. Includes requirements for coarse aggregates.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 13Yc; 1935, and Addendum 1; 1942. Concrete Construction. Includes requirements for coarse aggregate.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70, 512.10; gravel, broken stone, slag, *see* 512.11, 512.15, 512.2; coarse aggregate for concrete, concrete bricks and blocks, concrete sidewalks, concrete poles and posts, *see* 516.3, 516.4, 518.5, 516.9; coarse aggregate for road construction, *see* 518.2, 518.3; coarse aggregate for bridges and piling, *see* 518.4; coarse aggregate for buildings, *see* 518.5; coarse aggregate for drainage structures, concrete drain and sewer pipe, *see* 518.6; coarse aggregate for tanks and concrete masonry, *see* 518.7, 518.8.

512.15 Broken Stone

American Assn. of State Highway Officials, M62-42. Standard Specifications for Crushed Stone, Crushed Slag, and Crushed Gravel for Dense-Graded Bituminous Road and Plant-Mix Surface Course. Gives scope, general requirements, physical properties, and methods of testing.

American Assn. of State Highway Officials, M63-42. Standard Specifications for Crushed Stone, Crushed Slag, and Crushed Gravel for Open-Graded Bituminous Road-Mix Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M75-42. Standard Specifications for Crushed Stone and Crushed Slag for Base Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M76-42. Standard Specification for Crushed Stone and Crushed Slag for Bituminous Concrete Base Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M77-42. Standard Specification for Crushed Stone and Crushed Slag for Waterbound Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M78-42. Standard Specification for Crushed Stone and Crushed Slag for Bituminous Macadam Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M79-42. Standard Specification for Crushed Stone and Crushed Slag for Bituminous Concrete Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M80-42. Standard Specifications for Coarse Aggregate for Portland Cement Concrete. Gives scope, general requirements, deleterious substances, percentage of wear, weight per cubic foot of slag, soundness, grading, and methods of sampling and testing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Sheet Asphalt Pavements, Asphalt Block Pavements, and Asphalt Macadam Pavements. Gives requirements for stone for binder course sheet asphalt pavements.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Concrete and Reinforced Concrete Railroad Bridges and Other Structures, Gives requirements for broken stone—material, grading, resistance to abrasion, and methods of sampling and testing. Emergency Provisions, adopted Feb. 3, 1943, modified above specification in order to use local materials to conserve transportation.

American Society for Testing Materials, C 131-44; 1944. American Standards Assn., A 37.7-1944. American Assn. of State Highway Officials, T 96-44. Method of Test for Abrasion of Coarse Aggregate by Use of the Los Angeles Machine. For testing crushed rock, crushed slag, uncrushed gravel, and crushed gravel, for resistance to abrasion. Covers apparatus, abrasive charge, test sample, procedure, and calculation.

American Society for Testing Materials, D 448-42T; 1942. Tentative Specifications for Standard Sizes of Coarse Aggregate for Highway Construction. Cover standard size designations and maximum permissible ranges in mechanical analyses for standard sizes of coarse aggregate and screenings for use in the construction or maintenance of various types of highways and highway structures. Manufacture and standard sizes.

American Society for Testing Materials, D 692-42T; 1942. Tentative Specifications for Crushed Stone, Crushed Slag, and Gravel for Bituminous Concrete Base and Surface Courses of Pavements. Includes requirements for sieve analysis and for tests using A.S.T.M. methods.

American Society for Testing Materials, D 693-44; 1944. Crushed Stone and Crushed Slag for Bituminous Macadam Base and Surface Courses of Pavements. Cover the quality and grading of crushed stone to be used in the construction of bituminous macadam base and surface courses. General characteristics, physical properties, sizes, sieve analysis, and methods of sampling and testing.

American Society for Testing Materials, D 694-44; 1944. Crushed Stone, Crushed Slag, and Gravel for Water-Bound Base and Surface Courses of Pavements. Cover general characteristics, physical requirements, sizes, sieve analysis, and methods of sampling and testing using A.S.T.M. methods.

U. S. Gov., Federal Specification SS-C-726a; 1940. Amendment 1; 1940. Crushed-Stone, Crushed-Gravel, and Crushed-Slag; (for) Binder-Course, Sheet-Asphalt Pavement. Gives requirements for size, resistance to abrasion, weight of slag, and grading; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-C-731a; 1940. Amendment 1; 1941. Crushed-Stone, Crushed-Gravel, and Crushed-Slag; (for) Bituminous-Concrete Base or Surface-Course. Gives detail requirements for resistance to abrasion, weight of slag, and grading; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-C-736a; 1940. Amendment 1; 1941. Crushed-Stone and Crushed-Slag; (for) Bituminous-Macadam Base or Surface-Course. Gives requirements for resistance to abrasion, weight of slag, and grading; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-C-741a; 1940. Amendment 1; 1941. Crushed-Stone, Crushed-Slag, and Gravel; (for) Bituminous-Surface Treatment. Gives requirements for resistance to abrasion, grading, and methods of sampling and testing.

U. S. Gov., Federal Specification, SS-C-746a; 1940. Amendment 1; 1941. Crushed-Stone and Crushed-Slag; (for) Waterbound-Base or Wearing-Course. Gives requirements for resistance to abrasion, weight of slag, and grading; and methods of sampling and testing.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Loose Riprap.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Stone for Gravel Sheathing, Shoulders, and Watering.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70, 512.10; railway ballast, *see* 511.73; fine and coarse aggregates, *see* 512.13, 512.14; broken stone for concrete, concrete bricks and blocks, concrete sidewalks, concrete poles and posts, *see* 516.3, 516.4, 516.5, 516.9; broken stone for road construction, *see* 518.1, 518.2, 518.3; broken stone for bridges and piling, *see* 518.4; broken stone for buildings, *see* 518.5; broken stone for drainage structures, concrete drain and sewer pipe, *see* 518.6; broken stone for tanks and concrete masonry, *see* 518.7, 518.8.

512.16 Mineral Fillers

American Assn. of State Highway Officials, M17-42. Standard Specifications for Mineral Filler for Sheet Asphalt and Bituminous Concrete Pavements. Gives scope, general requirements, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M89-42. Standard Specifications for Mixed Asphalt and Mineral Filler. Gives scope, general requirements, mineral filler, fineness of mineral filler, properties of mixture, and methods of sampling and testing.

American Society for Testing Materials, C 117-37; 1937. American Assn. of State Highway Officials, T 11-42. American Standards Assn., A 37.4-1943. Method of Test for Amount of Material Finer Than No.200 Sieve in Aggregates. Describes sieves and container for test sample and procedure for washing and weighing screened material to determine the loss of matter finer than No.200 sieve.

American Society for Testing Materials, D 57-20; 1920. American Standards Assn., A31-1924. Materials for Cement Grout Filler for Brick and Stone Block Pavements. General quality and grading requirements for sand; test requirements for tensile strength for cement mortar made with the sand to specified proportions; cement according to A.S.T.M. specifications for Portland cement.

American Society for Testing Materials, D 242-39; 1939. Mineral Filler for Sheet Asphalt and Bituminous Concrete Pavements. Includes limestone dust, Portland cement, or other mineral matter; screen grading requirements, tested in accordance with A.S.T.M. method D 546.

American Society for Testing Materials, D 546-41; 1941. American Standards Assn., A 37.14-1943. American Assn. of State Highway Officials, T 37-42. Method of Test for Sieve Analysis of Mineral Filler. Fillers used in road and paving materials. Covers apparatus, sample, drying of sample, procedure, machine sieving, report, and reproducibility of results.

U. S. Gov., Federal Specification SS-M-351; 1931. Mineral-Filler; (for) Sheet Asphalt or Asphaltic Concrete Pavements (Portland Cement, Limestone Dust, and Dolomite Dust). Gives requirements for material and grading and methods of testing.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 511.70, 512.10; sand, *see* 512.12; bituminous fillers, *see* 505.15.

512.2 SLAG

American Assn. of State Highway Officials, M62-42. Standard Specifications for Crushed Stone, Crushed Slag, and Crushed Gravel for Dense-Graded Bituminous Road and Plant-Mix Surface Course. Gives scope, general requirements, physical properties, and methods of testing.

American Assn. of State Highway Officials, M63-42. Standard Specifications for Crushed Stone, Crushed Slag, and Crushed Gravel for Open-Graded Bituminous Road-Mix Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M75-42. Standard Specifications for Crushed Stone and Crushed Slag for Base Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M76-42. Standard Specification for Crushed Stone and Crushed Slag for Bituminous Concrete Base Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M77-42. Standard Specification for Crushed Stone and Crushed Slag for Waterbound Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M78-42. Standard Specification for Crushed Stone and Crushed Slag for Bituminous Macadam Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M79-42. Standard Specification for Crushed Stone and Crushed Slag for Bituminous Concrete Surface Course. Gives scope, general requirements, physical properties, grading, and methods of sampling and testing.

American Assn. of State Highway Officials, M80-42. Standard Specifications for Coarse Aggregate for Portland Cement Concrete. Cives scope, general requirements, deleterious substances, percentage of wear, weight per cubic foot of slag, soundness, grading, and methods of sampling and testing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Concrete and Reinforced Concrete Railroad Bridges and Other Structures. Gives requirements for slag—material, grading, resistance to abrasion, and methods of sampling and testing. Emergency Provisions, adopted Feb. 3, 1943, modified above specifications in order to use local materials to conserve transportation.

American Society for Testing Materials, C 130-42; 1942. Lightweight Aggregates for Concrete. Covers pumice, lava, tufa, slag, burned clay, burned shale, certain cinders, or other material having strong, durable particles. Gives limits for deleterious substances, organic impurities, grading, unit weight, mortar strength, soundness, and tests in accordance with A.S.T.M. methods.

American Society for Testing Materials, C 131-44; 1944. American Standards Assn., A 37.7-1944. American Assn. of State Highway Officials, T 96-44. Method of Test for Abrasion of Coarse Aggregate by Use of the Los Angeles Machine. For testing crushed rock, crushed slag, uncrushed gravel, and crushed gravel for resistance to abrasion. Covers apparatus, abrasive charge, test sample, procedure, and calculation.

American Society for Testing Materials, D 448-42T; 1942. Tentative Specifications for Standard Sizes of Coarse Aggregate for Highway Construction. Cover standard size designations and maximum permissible ranges in mechanical analyses for standard sizes of coarse aggregate and screenings for use in the construction or maintenance of various types of highways and highway structures. Manufacture and standard sizes.

American Society for Testing Materials, D 692-42T; 1942. Tentative Specifications for Crushed Stone, Crushed Slag, and Gravel for Bituminous Concrete Base and Surface Courses of Pavements. Includes requirements for sieve analysis and for tests using A.S.T.M. methods.

American Society for Testing Materials, D 693-44; 1944. Crushed Stone and Crushed Slag for Bituminous Macadam Base and Surface Courses of Pavements. Cover the quality and grading of crushed stone to be used in the construction of bituminous macadam base and surface courses. General characteristics, physical properties, sizes, sieve analysis, and methods of sampling and testing.

American Society for Testing Materials, D 694-44; 1944. Crushed Stone, Crushed Slag, and Gravel for Water-Bound Base and Surface Courses of Pavements. Cover general characteristics, physical requirements, sizes, sieve analysis, and methods of sampling and testing, using A.S.T.M. methods.

National Slag Assn. Blast Furnace Slag as Concrete Aggregate, 1930. Covers definition of blast furnace slag, introduction, processing blast furnace slag, physical and chemical characteristics of slag, and properties of slag concrete. Reprint from the copyrighted Journal of the American Concrete Institute.

National Slag Assn. Report of Investigation of Crushed Blast Furnace Slag as a Medium in Sewage Trickling Filters, 1929. Reprinted, 1935. Covers manufacture and properties of blast furnace slag, preparation of slag for commercial use, purpose of sewage filters, qualities to be considered in a filtering material, field investigations, durability, clogging, cementation, gradation of material, size of material, surface texture of material, cleanliness of material, flies, physical and chemical data on samples of slag collected from existing filters, summary, and conclusions.

U. S. Gov., Federal Specification SS-C-726a; 1940. Amendment 1; 1940. Crushed-Stone, Crushed-Gravel, and Crushed-Slag; (for) Binder-Course, Sheet-Asphalt Pavement. Gives requirements for size, resistance to abrasion, weight of slag, and grading; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-C-731a; 1940. Amendment 1; 1941. Crushed-Stone, Crushed-Gravel, and Crushed-Slag; (for) Bituminous-Concrete Base or Surface-Course. Gives detail requirements for resistance to abrasion, weight of slag, and grading; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-C-736a; 1940. Amendment 1; 1941. Crushed-Stone and Crushed-Slag; (for) Bituminous-Macadam Base or Surface-Course. Gives requirements for resistance to abrasion, weight of slag, and grading; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-C-741a; 1940. Amendment 1; 1941. Crushed-Stone, Crushed-Slag, and Gravel; (for) Bituminous-Surface Treatment. Gives requirements for resistance to abrasion, grading, and methods of sampling and testing.

U. S. Gov., Federal Specification SS-C-746a; 1940. Amendment 1; 1941. Crushed-Stone and Crushed-Slag; (for) Waterbound-Base or Wearing-Course. Gives requirements for resistance to abrasion, weight of slag, and grading; and methods of sampling and testing.

U. S. Gov., Federal Specification SS-M-51; 1931. Materials; (for) Cushion Course, Brick, Stone-Block, or Wood-Block Pavements (Sand, Slag, Limestone, Screenings, Etc.) Covers sand, granulated slag, slag screenings, and limestone screenings. Gives requirements for material and grading and methods of sampling and testing.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-7A; 1933. Roofing Material; Surfacing, Built-Up, Bituminous.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10; railway ballast, *see* 511.73; fine and coarse aggregates, *see* 512.13, 512.14; phosphate slag as fertilizer, *see* 852; *see* references under 512.13 and 512.14 which are in general applicable to slag.

513. SAND-LIME BRICK

American Society for Testing Materials, C 73-39; 1939. American Standards Assn., A78.1-1942. Sand-Lime Building Brick. For use in brick masonry, three grades based on exposure to freezing and moisture, or for use as back-up; requirements for minimum compressive strength and modulus of rupture; dimensions of standard size; inspection and tests in accordance with A.S.T.M. method C 67.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R38-37; 1937. Sand-Lime Brick. This recommendation establishes one standard size of sand-lime brick and tolerances of 1/8 in. in width and for thickness and 1/4 in. in length. Initiated by the Sand-Lime Brick Assn.

U. S. Gov., Federal Specification SS-B-681; 1932. Brick; Sand-Lime. Covers three grades—(H) hard, (M) medium, and (S) soft; made of lime and sand, crushed stone, or crushed blast-furnace slag, hardened by treatment with high-pressure steam. Gives requirements for absorption and strength; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions, methods of sampling and of testing, *see* 500, 534.10; lime for sand lime brick, *see* 517.2; brick pavements. *see* 518.35; clay brick, fire brick, *see* 534.11, 534.12; brick in building construction, *see* 518.5; brick masonry, *see* 518.83.

514. GYPSUM, GYPSUM PLASTERS, AND OTHER PLASTERS

514.0 GENERAL ITEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Lathing and Plastering. Gives requirements for interior plastering.

American Society for Testing Materials, C11-41; 1941. Definitions of Terms Relating to Gypsum. Defines accelerator, binder, cement, calcined gypsum, crushed gypsum, gypsum, gypsum lath, gypsum molding plaster, gypsum pottery plaster, gypsum partition tile or block, gypsum sheathing board, gypsum wall board, Keene's cement, lath, mortar, plaster, retarder, sized gypsum, stucco, and wood fiber.

American Society for Testing Materials, C 11-41T; 1941. Tentative Definitions of Terms Relating to Gypsum. Defines aggregate, consistency, gypsum concrete, gypsum fiber concrete, perforated gypsum lath, and plasticity.

American Society for Testing Materials, C 26-42; 1942. American Standards Assn., A70.1-1942. Methods of Testing Gypsum and Gypsum Products. Cover procedures for the determination of chemical analysis and physical testing of gypsum materials; for free water, fineness, carbon dioxide, silicon dioxide, iron and alumina, lime, magnesium oxide, sulfur dioxide, and sodium chloride; normal consistency, water-carrying capacity, dry bulk, wet bulk, tensile strength, compressive strength, and report. Also for sand, wood fiber content, compressive strength of gypsum partition tile or block, absorption of tile or block, and flexural strength of boards.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS3; 1938. Suitability of Fiber Insulating Lath as a Plaster Base. The investigation pertains to the properties of wall and plaster boards and the suitability of fiber insulating boards as a plaster base. Such properties as density, strength (flexural and tensile), and linear changes accompanying changes in relative humidity and wetting and drying were studied. Methods of successful application of plaster on insulating lath were determined by experiments in which the thickness, sand content, strength, and time of set of the plasters were varied independently.

References.—Methods of lathing and plastering, *see* 514.63.

514.1 GYPSUM

American Society for Testing Materials, C 22-41; 1941. American Standards Assn., A 49.1-1941. Gypsum. Covers gypsum containing 64.5 percent by weight of calcium sulfate combined with two molecules of water in crystalline form; requirements for run-of-mine, crushed, sized, and ground to pass four degrees of fineness sieves; sampling, methods of test, packing, and marking.

References.—Definitions, methods of sampling and of testing, *see* 500, 514.0; calcined gypsum, plaster of Paris, *see* 514.2; gypsum plaster, *see* 514.3; gypsum plaster board and wall board, *see* 514.61; gypsum tiles and blocks, *see* 514.62.

514.2 CALCINED GYPSUM (PLASTER OF PARIS)

American Hospital Assn., 13-13. Plaster-of-Paris Bandages. Covers one type, one grade, and one class in four sizes. Based on U. S. Gov. Federal Specifications GG-B-101a for Plaster-of-Paris Bandages and CCC-G-101a for Plain Gauze.

American Hospital Assn., 13-22. Surgical Plaster of Paris. Covers two types (orthopedic and impression), one grade, and one class. Based on U. S. Army Specifications 10-2422A for Surgical Plaster of Paris, U.S. Gov. Federal Specifications RR-S-366 for Standard Testing Sieves, and SS-G-901 for Calcined Gypsum.

American Society for Testing Materials, C 61-40; 1940. American Standards Assn., A 66.1-1941. Keene's Cement. Covers anhydrous calcined gypsum the set of which is accelerated by other materials; requirements for time of setting, tensile strength, fineness, sampling, methods of testing, and simple field test for identification.

American Society for Testing Materials, C 72-40; 1940. American Standards Assn., A 65.1-1941. Calcined Gypsum for Dental Plasters. Covers three grades—(Q) quick setting, (M) medium setting, and (S) slow setting. Gives requirements for composition, time of setting, tensile strength, fineness, sampling, laboratory samples, methods of testing, packing and marking, inspection, rejection, and rehearing.

U. S. Gov., Federal Specification GG-B-101b; 1943. Bandages; Plaster-of-Paris. Covers one type, one grade, and five sizes—3 in. by 3 yd., 2 in. by 5 yd., 3 in. by 5 yd., 5 in. by 5 yd., and 6 in. by 5 yd. Gives requirements for material, workmanship, description, amount of plaster, sizing, individual packages, and leakage; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification SS-G-901; 1930. Gypsum; Calcined. Covers two grades—(I) fine and (II) medium. Gives requirements for chemical composition, tensile strength, compressive strength, fineness, and time of set; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 366; 1939. Plaster-of-Paris; Orthopedic and Impression (Dental). Shall contain not less than 93 percent calcined gypsum, dry and free from foreign material and partly set or caked lumps. Gives detail requirements as to fineness, setting, expansion, testing consistency, compressive strength, and setting time; methods of inspection and tests; and packing and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2422B; 1941. Plaster of Paris; Surgical.

References.—Definitions, methods of sampling and of testing, *see* 500, 514.0; gypsum, *see* 514.1; packaging of dental investments, *see* 915.10.

514.3 GYPSUM PLASTER

American Institute of Architects, joint sponsor with American Society for Testing Materials. Specifications for Gypsum Plastering (Including Requirements for Lathing and Furring), 1942. American Standards Assn., A 42.1-1942. Gives general provisions, description of terms, materials meeting A.S.T.M. specifications; requirements for base coat, hand and mechanical mixing, minimum temperature, condition of base and types of base, and finishing. Also gives requirements for gypsum lath, wood lath, fiber insulation lath, metal lath, and paper backed wire fabric; lathing, ceiling erection, solid partitions, furring, etc.

Gypsum Assn., joint sponsor with Building Officials' Conference of America, Inc. American Standards Assn., A59.1-1941. Reinforced Gypsum Concrete. Recommended building code requirements, including—(1) materials, (2) strength of gypsum concrete, (3) reinforcement, (4) design, and (5) inspection.

American Society for Testing Materials, C 28-40; 1940. American Standards Assn., A49.3-1940. Gypsum Plasters. Definition, composition, time of setting, tensile strength, requirements for first and second coat of gypsum, ready-sanded plaster, neat plaster, wood-fibered plaster, and calcined gypsum for finishing coat, using A.S.T.M. test method C 26.

American Society for Testing Materials, C 59-40; 1940. American Standards Assn., A49.4; 1940. Gypsum Molding Plaster. For making interior embellishments, cornices, etc.; requirements on percentage of calcined gypsum; time of setting, tensile strength, and sampling, using A.S.T.M. test method C 26.

American Society for Testing Materials, C 60-40; 1940. American Standards Assn., A49.5-1940. Gypsum Pottery Plaster. Calcined gypsum for making pottery molds; requirements on percentage of calcined gypsum; time of setting, tensile strength, fineness, and sampling requirements, using A.S.T.M. test method C 26.

U. S. Gov., Federal Specification SS-P-401; 1931. Plaster; Gypsum. Covers four types—(W) wood-fibered, (N) neat, (B) sanded brown coat, and (S) sanded scratch coat. Gives requirements for material and workmanship, chemical composition, and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions, methods of sampling and of testing, *see* 500, 514.0; sand, *see* 512.12; gypsum, *see* 514.1; wall plasters and methods of plastering, *see* 514.63.

514.4 LIME PLASTER

National Lime Assn. Specifications for Lime Plaster and Lime Stucco. Requirements on materials, mix proportions, application, and workmanship; recommendations for preparation of masonry and concrete surface to receive plaster and desirable thicknesses on various backings.

References.—Definitions, methods of sampling and of testing, *see* 500, 514.0; sand, *see* 512.12; lime, *see* 517.2; wall plasters and methods of plastering, *see* 514.63.

514.5 PORTLAND CEMENT PLASTER

Portland Cement Assn. Plasterer's Manual for Applying Portland Cement Stucco and Plaster, 1941. Covers Portland cement stucco including—material specifications, coloring materials, bases, suction, curing, proportioning and mixing, flashing, application, refinishing old stucco jobs, causes of discoloration, finish coat, textures, and plastering and texturing tools; Portland cement plaster including—material specifications, bases, suction, curing, proportioning and mixing, application, and painting; and construction details.

514.6 PLASTER MANUFACTURES

514.61 Gypsum Plaster Board and Wall Board

American Hospital Assn., 4-40. Gypsum Plaster Board. Covers one type. Based on U. S. Gov. Federal Specification SS-P-431a for Gypsum Plaster Board.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Lathing and Plastering. Gives requirements for gypsum lath and lathing.

American Society for Testing Materials, C 36-42; 1942. American Standards Assn., A69.1-1942. Gypsum Wall Board. For use without the addition of plaster for walls, ceilings, and partitions, and suitable to receive decoration. Gives requirements for composition, flexural strength, sampling, dimensions, weights and permissible variations, finish, and marking.

American Society for Testing Materials, C 37-42; 1942. American Standards Assn., A67.1-1942. Gypsum Lath. Includes plain, perforated, and aluminum foil backed plaster board designed as a base for gypsum plaster; requirements as to composition, flexural strength, sampling, sizes, weights and permissible variations, and finish.

American Society for Testing Materials, C 79-42; 1942. American Standards Assn., A68.1-1942. Gypsum Sheathing Board. For sheathing of buildings; requirements for composition, flexural strength, sampling, dimensions, weights and permissible variations, finish, and marking.

U. S. Gov., Federal Specification SS-P-431a; 1935. Plaster-Board; Gypsum. Covers one type—set gypsum plaster, with or without fiber, reinforced on the surface with sheets of fibrous material. Gives requirements for material and workmanship and bond; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-S-276; 1943. Sheathing-Board; Gypsum. Covers one type. Gives requirements for material and workmanship, thickness, width, length, weight, and flexural strength; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., Federal Specification SS-W-51a; 1935. Amendment 1; 1937. Wall-Board; Gypsum. Covers two types—(A) boards with square edges, with or without recess, designed for butted joints and (B) boards with rounded edges, designed for filled joints. Gives requirements for thickness, width, length, weight, and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions, methods of sampling and of testing, *see* 500, 514.0; gypsum, *see* 514.1; fire tests of building materials, *see* 518.50.

514.62 Gypsum Tiles and Blocks

American Society for Testing Materials, C 52-41; 1941. Gypsum Partition Tile or Block. For use in nonload-bearing construction in the interior of buildings and for the protection of columns, elevator shafts, etc., against fire. Composition, compressive strength, sampling, form, core spaces, dimensions, scoring, marking, inspection, rejection and rehearing.

References.—Definitions, methods of sampling and of testing, *see* 500, 514.0; gypsum, *see* 514.1; fire tests of building materials, *see* 518.50.

514.63 Wall Plasters

American Society for Testing Materials, C 61-40; 1940. American Standards Assn., A66.1-1941. Keene's Cement. Covers anhydrous calcined gypsum the set of which is accelerated by other materials; requirements for time of setting, tensile strength, fineness, sampling, methods of testing, and simple field test for identification.

Contracting Plasterers' International Assn. Standard Specification. Includes requirements for dimensions of metal and wood lath, sizes of nails, requirements on lathing, furring, suspended ceiling construction, quality of materials used, preparation of lime putty, application of hard finish, scratch and brown coats, composition and application of stucco scratch coat and brown coat, minimum thickness of plaster and of grounds, rules for measurement of lathing and plastering.

U. S. Gov., Federal Specification SS-C-161; 1933. Cement; Keene's. Covers anhydrous calcined gypsum of two types—(I) for base and finish coat plastering and (II) for finish coat plastering. Gives requirements for chemical composition, tensile strength, fineness, and time of set; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions, methods of sampling and of testing, *see* 500, 514.0; gypsum plaster, *see* 514.3; lime plaster, *see* 514.4.

514.65 Acoustical Plaster

U. S. Gov., Federal Specification SS-A-111; 1940. Acoustic-Materials; (for) Plastic-Application. Covers three types — (I) acoustic plaster, composed of a granular aggregate mixed with a binder, (II) acoustic materials other than plaster which are applied with a trowel, and (III) fibrous materials combined with a binder agent which are sprayed on with an air gun or blower. Gives requirements for sound absorption coefficients, classes for noise reduction, and material; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

515. MAGNESITE

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 4.20; 1938. Watertight Floors. Covers methods for improving construction where floor leakage is a serious defect. Includes description of common methods of waterproofing (hot asphalt mastic flooring, emulsified asphalt flooring, magnesite composition flooring, and light weight special surfacing); recent developments in waterproofing; and general precautions.

U. S. Gov., Navy Dept. Specification 51M3; 1935. Magnesite; Dead-Burned.

U. S. Gov., U. S. Maritime Commission. Specification 59-MC-1; 1942. Preparation of Steel Plating in Way of Magnesite Deck Covering. Gives requirements for bituminous solution and enamel, reinforcing mesh, expanded metal, furring stools, cleaning of deck plating, placement of furring stools, application of primer and enamel, placement of reinforcing mesh, sampling, and inspection.

515.0 GENERAL ITEMS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Magnesite, Dead Burned and Calcined (Calcined Magnesite; Caustic Magnesite; Dead Burned Magnesite). Covers definition, derivation and characteristics, uses, grades and forms, containers, and substitutes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Burned Magnesite, Sample 104. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

516. CEMENT, CONCRETE, AND MORTAR

516.0 GENERAL ITEMS

American Assn. of State Highway Officials, T1; 42. Standard Methods of Sampling and Physical Testing of Portland Cement. Gives scope, sampling, fineness, mixing cement pastes and mortars, normal consistency, soundness, time of setting, tensile strength, and specific gravity.

American Assn. of State Highway Officials, T25-35. Standard Method of Test for Absorption by Concrete. Gives details for selecting samples and for preforming the absorption test.

American Assn. of State Highway Officials, T26-35. Standard Method of Test for Quality of Water To Be Used in Concrete. Gives test procedure for testing for acidity, alkalinity, total solids and inorganic matter, and comparison with distilled water in making concrete.

American Concrete Institute in connection with Portland Cement Assn., Concrete Reinforcing Steel Institute, and Rail Steel Bar Assn. Reinforced Concrete Design Handbook. Includes list of symbols and notation and gives formulae with application discussions and examples for design and investigation of flexural members, design of stirrups, columns, and footings; and includes tables for reference in design.

American Concrete Institute. A.C.I. Manual of Concrete Inspection, 1941. Gives requirements for inspection organization and equipment, qualifications and responsibility of the inspector, fundamentals of concrete, inspection and testing of materials, proportioning methods, inspection before concreting, inspection of concreting, inspection after concreting, testing of concrete, records and reports, special methods of concreting, references, and check list of principal features of inspection.

American Concrete Institute. Building Regulations for Reinforced Concrete, A.C.I. 318-41; 1941. Includes provisions for permits and drawings, special systems, definitions, and covers materials and tests, quality and working stresses, mixing and placing, forms, and details of construction, general design considerations, flexural computations, shear and diagonal tension, bond and anchorage, flat slabs, columns and walls, and footings.

American Public Works Assn. Sewers, J1-38; 1938. Includes specifications for bulk and package delivery, storage and inspection, sampling and tests using A.S.T.M. methods, and requirements for quality of construction water.

American Society for Testing Materials, C 31-44; 1944. American Assn. of State Highway Officials, T 23. Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field. For concrete samples from concrete being used in construction. Covers sampling of concrete, size of specimens, molds, molding specimens, capping specimens, and curing specimens for compression test specimens and flexure test specimens.

American Society for Testing Materials, C 39-44; 1944. American Assn. of State Highway Officials, T 22. Method of Test for Compressive Strength of Molded Concrete Cylinders. Covers scope, apparatus, test specimens, procedure, calculation, and report.

American Society for Testing Materials, C 42-44; 1944. American Assn. of State Highway Officials, T 24. Methods of Securing, Preparing, and Testing Specimens From Hardened Concrete for Compressive and Flexural Strengths. For specimens of hardened concrete from structures and pavements. Covers precautions, apparatus, test specimens, procedure, length of drilled core specimens, compressive strength, and flexural strength.

American Society for Testing Materials, C 78-44; 1944. American Assn. of State Highway Officials, T 97. Method of Test for Flexural Strength of Concrete, Using Simple Beam With Third-Point Loading. Covers scope, apparatus, test specimens, procedure, measurement of specimens after test, calculations, and report.

American Society for Testing materials, C 85-42; 1942. Method of Test for Cement Content of Hardened Portland-Cement Concrete. For hardened concretes except those containing aggregates such as slag, diatomites, and sodium silicate which liberate soluble silica under conditions of test. Covers solutions required, preparation of sample, and method of procedure.

American Society for Testing Materials, C 109-44; 1944. American Assn. of State Highway Officials, T 106. Method of Test for Compressive Strength of Hydraulic Cement Mortars. Covers scope, apparatus, temperature and humidity, graded standard sand, sieve analysis of sand, number of specimens, preparing specimen molds, proportioning, consistency, mixing of mortars, determination of flow, molding test specimens, storing test specimens, procedure, calculation, and faulty cubes and retests.

American Society for Testing Materials, C 116-44; 1944. Method of Test for Compressive Strength of Concrete Using Portions of Beams Broken in Flexure, Modified Cube Method. Covers scope, test specimens, preparation of test specimen, procedure, and calculation and report.

American Society for Testing Materials, C 124-39; 1939. American Assn. of State Highway Officials, T 120-42. Method of Test for Flow of Portland-Cement Concrete by Use of the Flow Table. Covers description and diagrams of mold and flow table, securing of sample, and calculation of flow percentage from spread of molded specimen over flow table.

American Society for Testing Materials, C 125-44; 1944. Definitions of Terms Relating to Concrete and Concrete Aggregates. Defines admixture, blast-furnace slag, crushed gravel, crushed stone, elongated piece, fineness modulus, flat piece, gravel, and water-cement ratio.

American Society for Testing Materials, C 138-44; 1944. American Assn. of State Highway Officials, T 121. Method of Test for Weight Per Cubic Foot, Yield, and Air Content (Gravimetric) of Concrete. Covers scope, apparatus, calibration of measure, sample, procedure, and calculations.

American Society for Testing Materials, C 143-39; 1939. American Assn. of State Highway Officials, T 119-42. Method of Slump Test for Consistency of Portland-Cement Concrete. For use where aggregate is mainly under 2 in. in size; description of mold, securing of sample for test, filling of mold, and recording of slump.

American Society for Testing Materials, C 156-44T; 1944. Tentative Method of Test for Water Retention Efficiency of Methods for Curing Concrete. For laboratory use and measured by their ability to prevent moisture loss during the early hardening period. Covers scope, apparatus, test specimens, control specimens, proportioning and mixing mortar, molding specimens, number of specimens, storage of specimens, application of curing materials, duration of test, corrections, and calculations.

American Society for Testing Materials, C 157-43; 1943. Method of Test for Volume Change of Cement Mortar and Concrete. Covers standardized procedure to measure volume changes due to chemical change, moisture change, or similar causes where temperature changes are kept negligible. Covers apparatus, test specimens, storage of specimens, procedure, and report.

American Society for Testing Materials, C 163-44; 1944. Methods of Sampling and Mixing Thermal Insulating Cement. For preparation of specimens for use in all tests on the cement. Covers apparatus, mixing water, sampling, and procedure for mixing.

American Society for Testing Materials, C 164-44; 1944. Method of Test for Bulk Density of Thermal Insulating Cement. The procedure for determining the bulk density of thermal insulating cement to permit the calculation of the necessary storage space for a given quantity of cement in packages as received. Covers definition, apparatus, procedure, and calculation.

American Society for Testing Materials, C 172-44; 1944. Method of Sampling Fresh Concrete. For obtaining samples of fresh concrete from mixers, hoppers, or transportation units. Covers size of sample, procedure for sampling, and mixing composite sample.

American Society for Testing Materials, C 173-42T; 1942. Tentative Method of Test for Air Content (Volumetric) of Freshly Mixed Concrete. For all ordinary types of concrete and mortar. Gives apparatus, calibration of pycnometer and measure, determination of density of laboratory water, procedure, and calculation.

American Society for Testing Materials, C 174-44; 1944. Method of Measuring Length of Drilled Concrete Cores. For determining the length of a core drilled from a concrete structure, particularly from a concrete pavement. Covers apparatus, test specimens, procedure, and report.

American Society for Testing Materials, C 183-44; 1944. Method of Sampling Hydraulic Cement. Covers scope, size and number of samples, by whom taken, sampling from cars, trucks, etc.; sampling from bulk storage, preparation of sample, and number of tests.

American Society for Testing Materials, C 184-44; 1944. Method of Test for fineness of Hydraulic Cement by the No. 200 Sieve. Covers scope, apparatus, procedure, calculation, and mechanical sieving.

American Society for Testing Materials, C 185-44 T; 1944. Tentative Method of Test for the Air Content of Portland-Cement Mortar. Covers scope, apparatus, temperature, standard sand, procedure, calculation, and reproducibility.

American Society for Testing Materials, C 186-44 T; 1944. Tentative Method of Test for Heat of Hydration of Portland Cement. Covers scope, apparatus, reagents, procedure for determining heat capacity of apparatus, procedure for determining heat of hydration, and calculations.

American Society for Testing Materials, C 187-44; 1944. Method of Test for Normal Consistency of Hydraulic Cement. Covers scope, apparatus, temperature, procedure, and calculation.

American Society for Testing Materials, C 188-44; 1944. Method of Test for Specific Gravity of Hydraulic Cement. Covers scope, apparatus, procedure, calculation, and reproducibility.

American Society for Testing Materials, C 189-44; 1944. Method of Test for Soundness of Hydraulic Cement Over Boiling Water, Pat Test. Covers scope, apparatus, test specimen, procedure, and illustrations.

American Society for Testing Materials, C 190-44; 1944. Method of Test for Tensile Strength of Hydraulic-Cement Mortars. Covers scope, apparatus, temperature and humidity, standard sand, test specimens, proportioning, consistency, mixing of mortars, molding test specimens, storage of test specimens, procedure, faulty briquets, and retests.

American Society for Testing Materials, C 191-44; 1944. Method of Test for Time of Setting of Hydraulic Cement by the Vicat or Gillmore Needles. Covers scope, apparatus, temperature and humidity, preparation of cement paste, procedure for Vicat method, and procedure for Gillmore method.

American Society for Testing Materials, C 192-44 T; 1944. Tentative Methods of Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory. Covers scope, preparation of materials, weighing materials, mixing concrete, consistency and yield of concrete, number of specimens; and size of specimens, molds, molding specimens, capping specimens, and curing specimens for compression and flexure test specimens.

Calcium Chloride Assn. Bulletin 28; 1943. Early Strength Concrete—The Use of Calcium Chloride in Concreting. For early high strength, cold weather protection, more workable concrete, easier finishing, uniform and dependable curing, and greater strength. Covers general information, practical experience with calcium chloride, technical abstracts and references, and specifications.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Code of Standard Practice. The practices and customs contained in this code are in accordance with good engineering practice, tend to insure safety in reinforced concrete construction, and are standard within the industry. Covers engineering service, estimating, materials, execution, and standard procedure.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Specifications for Placing Accessories. All reinforcing steel shall be accurately located in the forms, and firmly held in place, before and during the placing of concrete, by means of wire supports adequate to prevent displacement during the course of construction and to keep the steel at a proper distance from the forms. Covers one way slab construction, joist-beam-girder construction, flat slab construction, and accessory specifications and standard nomenclature, together with diagrams.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Specifications for Placing Reinforcement. All reinforcing steel must be placed in accordance with the following requirements—(a) bars shall be clean and sound, (b) bars shall be formed to correct dimensions, (c) bars shall be properly spaced, (d) bars shall be continuous, (e) special anchorage, and (f) bars shall be properly embedded.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Standard Details of Design. To assist the designer in giving his clients the most economical and satisfactory structure that can be designed. Covers design, code of standard practice, sizes of bars and spirals, grade of steel, length of bars, beams and girders, flat slabs, height of stories, columns, footings, forms, and fabrication of reinforcing steel.

National Sand and Gravel Assn. Bulletin 1; 1931. Estimating Quantities of Materials for Concrete. The method described in this paper is based on the obvious fact that the volume of concrete is equal to the volume of the solids in the aggregate plus the volume of cement paste, so long as there is a negligible quantity of unfilled voids or entrained air. Gives simple formula, derivation of equations, diagram for estimating barrels of cement per cubic yard of concrete, examples of application of method, comparisons of measured quantities, five tables showing data, and advantages of low voids.

National Sand and Gravel Assn. Bulletin 4; 1935. Tables of Quantities of Materials for Concrete. To present tables from which quantities of cement, fine and coarse aggregate per cubic yard of concrete, may be determined for a wide range in proportions, consistency, and gradings of aggregate. Covers comparison with other tables, scope of tables, use of tables, determination of voids, determination of quantity of mixing water, typical problems, and gives ten tables showing quantities of materials per cubic yard of concrete for various mixes.

National Sand and Gravel Assn. Circular 21; 1941. Proportioning Concrete Mixtures. The water-ratio principle, because of its simplicity and its basic soundness, has survived and found universal application in specifications for proportioning concrete. Gives a general discussion and includes tables showing compressive strength, water gallons per sack of cement, maximum size of gravel, water gallons per cubic yard of concrete, and sand percent by weight of total aggregate.

National Sand and Gravel Assn. Circular 26; 1944. Resistance of Concrete to Freezing and Thawing as Affected by Aggregates. This paper deals only with the ability of concrete to resist what is probably the most common and destructive weathering agency—freezing and thawing—and how that ability is affected by soundness of the aggregates. Covers manifestations of unsound aggregates, freezing and thawing tests of concrete, concrete investigations, and concluding remarks. Reprint from proceedings of conference on plans for Post-War Highways.

National Sand and Gravel Assn. Effect of Size of Specimen in Studies of Durability of Concrete as Affected by Aggregates, 1942. Freezing and thawing tests of concrete are finding wide acceptance as means for determining the suitability of aggregates for use in concrete exposed to weathering. Covers outline of tests, preparation and testing of specimens, and discussion of test results. Reprinted from the copyrighted A.S.T.M. Bulletin.

National Slag Assn. Materials Required per Cubic Yard of Slag, Stone, and Gravel Concrete, 1939. Data in tabular form showing the quantities of material required per cubic yard of concrete under varying conditions. Gives a series of tables showing quantities of aggregate in moist field condition and in dry condition per cubic yard of concrete in mixes containing various quantities of cement for various sizes of slag or stone aggregate and for various sizes of uncrushed gravel aggregate.

Portland Cement Assn. Concrete Facts for Concrete Contractors, Third Edition, 1942. Covers concrete—what it is, selection of materials, proportioning, mixing, placing, finishing, curing, colored concrete, colored concrete topping—suggested specifications, special surface finishes, forms, reinforced concrete, watertight concrete, high early strength concrete, and cold weather construction.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Cement (Turbidimetric Standard), Sample 114d. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS61; 1940. Structural Properties of Two Nonreinforced Monolithic Concrete Wall Constructions. The Masonry Construction Section of the National Bureau of Standards built 24 specimens representing two nonreinforced monolithic concrete wall constructions. The only difference in their construction was in the proportions of the concrete. The specimens were subjected to compressive, transverse, impact, concentrated, and racking loads. For each of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for each increment of load. The results are presented in graphs and a table.

516.1 CEMENT

516.10 General Items

American Society for Testing Materials, C 114-44; 1944. American Assn. of State Highway Officials, T 105. Chemical Analysis of Portland Cement. Covers scope, sampling, apparatus, purity of water and reagents, concentration of reagents, glassware, number of chemical determinations, and procedure for determining silicon dioxide, aluminum oxide, ferric oxide, calcium oxide, magnesium oxide, sulfur trioxide, loss on ignition, sodium oxide and potassium oxide, water soluble alkali, phosphorus pentoxide, manganic oxide, insoluble residue, chloroform soluble organic substances, free calcium oxide, and alternate methods.

American Society for Testing Materials, C 114-44T; 1944. Tentative Methods of Chemical Analysis of Portland Cement. Covers general requirements, and gives apparatus, reagents, and procedure for determining sodium oxide and potassium oxide, sulfide sulfur, sulfur trioxide, and vinsol resin.

American Society for Testing Materials, C 115-42; 1942. American Assn. of State Highway Officials, T 98. Method of Test for Fineness of Portland Cement by means of the Turbidimeter. Covers the Wagner turbidimeter apparatus and procedure for determining the fineness of Portland cement as represented by specific surface expressed as total surface area in square centimeters per gram of cement. Gives description of apparatus including light source, water cell, retarding filter, sedimentation tank, photoelectric cell, shield, and elevating device; microammeter, method of calibration, sieve determination, preparation of the suspension, procedure, and calculations.

American Society for Testing Materials, C 151-43; 1943. American Assn. of State Highway Officials, T 107. Method of Test for Autoclave Expansion of Portland Cement. For determining soundness by test of a neat cement specimen. Gives requirements for apparatus, temperature and humidity, preparation of test specimens, procedure, calculation, and retests.

516.11 Portland Cement

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes five classes of Portland cement conforming to American Society for Testing Materials Specification C 150, recommended uses for each type, and sampling and testing according to American Society for Testing Materials Specification C 77.

American Assn. of State Highway Officials, M85-42. Standard Specifications for Portland Cement. Gives scope, basis of purchase, definition, chemical limits, physical requirements, packaging and marking, storage, inspection, rejection, and methods of sampling and testing.

American Public Works Assn. Sewers, J1-38; 1938. For Portland cement this organization has adopted the current specification of the American Society for Testing Materials for Portland cement and also for high-early-strength Portland cement.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Portland Cement. Quality of cement and the methods of sampling and testing shall be same as American Society for Testing Materials Specification C 150.

American Society for Testing Materials, C 150-44; 1944. Portland Cement. Covers five types of Portland cement—(I) for use in general concrete construction, (II) for use in general concrete construction exposed to moderate sulfate action or where moderate heat of hydration is required, (III) for use when high early strength is required, (IV) for use when a low heat of hydration is required, (V) for use when high sulfate resistance is required. Covers basis of purchase, definition, chemical requirements, physical requirements, packaging and marking, storage, inspection, rejection, and methods of testing.

American Society for Testing Materials, C 175-44 T; 1944. Tentative Specifications for Air-Entraining Portland Cement for Concrete Pavements. For use in concrete pavements exposed to severe frost action. Covers basis of purchase, definition, chemical requirements, physical requirements, packaging and marking, storage, inspection, rejection, and methods of testing.

U. S. Gov., Federal Specification SS-C-191b; 1941. Amendment 1; 1943. Cement; Portland. Covers one grade. Gives requirements for materials and workmanship, chemical composition, fineness, soundness, time of setting, compressive strength, tensile strength, use of compressive or tensile tests, age at testing, and additions during grinding; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-C-201a; 1941. Amendment 1; 1943. Cement; Portland, High-Early-Strength. Covers one grade. Gives requirements for materials and workmanship, chemical composition, fineness, soundness, time of setting, compressive strength, tensile strength, use of compressive or tensile tests, age at testing, and additions during grading; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-C-206a; 1941. Amendment 1; 1943. Cement; Portland, Moderate-Heat-of-Hardening. Covers one grade. Gives requirements for materials and workmanship, chemical composition, fineness, soundness, time of setting, compressive strength, tensile strength, use of compressive or tensile tests, age of testing, additions during grinding, and heat of hydration; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-C-208a; 1941. Cement; Portland, Pozzolana. Covers one grade of an intimately interground mixture of Portland cement and those natural or artificial products composed essentially of silica and alumina. Gives requirements for chemical composition, soundness, time of setting, compressive strength, and additions during grinding; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-C-211a; 1940. Cement; Portland, Sulphate-Resisting. Covers one grade. Gives requirements for chemical composition, fineness, soundness, time of setting, and tensile and compressive strengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Definitions, methods of sampling and of testing, *see* 500, 516.0.

516.12 Natural Cement

American Society for Testing Materials, C 10-37; 1937. Natural Cement. Covers finely pulverized calcined argillaceous limestone with not over five percent added nondeleterious substances. Requirements for fineness, soundness, time of setting, tensile strength, marking, storage and inspection, with tests by A.S.T.M. methods.

References.—Definitions, methods of sampling and of testing, *see* 500, 516.0.

516.19 Miscellaneous Cements

American Society for Testing Materials, C 91-40; 1940. Masonry Cement. For use with sand for making mortar for laying masonry units; requirements for time of setting, soundness, compressive strength, water retention, staining, methods of testing, and apparatus for test.

American Society for Testing Materials, C 91-44T; 1944. Tentative Specifications for Masonry Cement. For cement to be used in conjunction with sand in the making of mortar for laying units of masonry construction. Covers time of setting, soundness, compressive strength, water retention, staining, packaging and marking, storage, inspection, rejection, and sampling and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. High-Temperature Refractory Cements. Covers definition, description, air-setting cements, sources of raw materials, desired properties, uses, and specifications.

U. S. Gov., Federal Specification HH-C-176; 1933. Cement; Silica. Covers one grade. Gives requirements for composition, softening point, and fineness; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-C-158a; 1941. Amendment 1; 1943. Cements; Hydraulic; General Specifications (Methods for Sampling, Inspection, and Testing). Covers requirements which are common to all detail specifications for cements unless specifically excepted in detail specification. It does not describe the material or article but provides means for determining whether the material or article conforms to the detail requirements. Complete test methods are given in detail.

U. S. Gov., Federal Specification SS-C-181b; 1938. Amendment 1; 1939. Cement; Masonry. For use in masonry mortars—water repellent, or nonstaining to limestone. Covers two types—(I) where not exposed to frost action and (II) general use. Gives requirements for fineness, time of setting, soundness, and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 32C8b; 1941. Cement; silica.

U. S. Gov., Navy Dept. Specification 52C13a; 1943. Cement-Compound; Iron or Steel.

References.—Definitions, methods of sampling and of testing, *see* 500, 516.0.

516.2 STUCCO

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Lathing and Plastering. Gives requirements for exterior stucco work.

Contracting Plasterers' International Assn. Standard Specification. Includes requirements for composition and application of scratch coat and of brown coat, application of stucco to masonry and concrete walls, ceilings and columns, and to painted walls.

National Lime Assn. Specification for Lime Plaster and Lime Stucco. Requirements on materials, mix proportions, application, and workmanship; recommendations for preparation of masonry and concrete surfaces to receive stucco and desirable thicknesses on various backings.

Portland Cement Assn. Plasterer's Manual for Applying Portland Cement Stucco and Plaster, 1941. Covers Portland cement stucco including—material specifications, coloring materials, bases, suction, curing, proportioning and mixing, flashing, application, refinishing old stucco jobs, causes of discoloration, finish coat, textures, and plastering and texturing tools; Portland cement plaster including—material specifications, bases, suction, curing, proportioning and mixing, application, and painting; and construction details.

Portland Cement Assn. Specifications for Portland Cement Stucco (on Concrete Masonry Walls), 1940. Covers general requirements, materials meeting A.S.T.M. specifications, preparation of surfaces, lathing, stucco mix proportions, thickness of stucco, curing and illustrations of procedure, and types of finishes.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10, 516.0; cement and lime, *see* 516.1, 517.2; sand and fine aggregate, *see* 512.12, 512.13.

516.3 CONCRETE AND MORTARS

American Public Works Assn. Sewers, J1-38; 1938. Includes specifications for bulk and package delivery, storage, inspection, work in freezing weather, water for concrete construction, measurement of water by weight and volume, concrete proportions and strength requirements for four classes of concrete, sampling and number of tests required for various volumes of work, depositing concrete under water, vibration, construction joints, and for test procedures using A.S.T.M. methods.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Architectural Terra Cotta. Gives requirements for mortar.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Asphalt Mastic Floors and Asphalt Block Floors. Gives requirements for mortar bed for block floors.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Brick Pavements and Floors. Gives requirements for cement mortar cushion and cement grout filler.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Brickwork. Gives requirements for mortar and mortar color.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Clay Hollow Tile. Gives requirements for mortar.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Concrete Architectural Stone. Gives requirements for mortar.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Creosoted Wood Block Pavements and Wood Block Floors. Gives requirements for mortar bed for laying blocks.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Macadam Pavements; and Cement Grouted Macadam Platforms, Floors, Pavements, and Pavement Bases. Gives requirements for grout.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Stone Masonry and Cut Stone Work. Gives requirements for mortar.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Concrete and Reinforced Concrete Railroad Bridges and Other Structures. Gives requirements for materials; proportioning and mixing; depositing in air, under water, in sea water, and in alkali soils or waters; curing; forms; metal reinforcement; protective covering; joints; waterproofing; and surface finish. Emergency Provisions adopted Feb. 3, 1943, provides for maximum reuse of material for forms and conserving metal by using outside bracing for metal ties and bituminous mastic for water tight joints in lieu of metal dams.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Shotcrete. Gives requirements for bonding surface, reinforcement. dowels, shotcrete, shooting strips, application, and curing.

American Society for Testing Materials, C 94-44; 1944. Ready-Mixed Concrete. Covers ready-mixed concrete for general use. Gives basis of purchase, materials, quality of concrete, range in slump, measuring materials, batching plant, mixers and agitators, mixing and delivery, inspection, sampling, slump, certification, strength, alternate strength basis, failure to meet specifications, and methods of testing.

American Society for Testing Materials, C 111-36; 1936. Sodium Silicate for Curing Concrete. For application to the surface of concrete for preventing moisture loss during curing. Covers formula and specific gravity, requirements for container size and type, and marking.

American Society for Testing Materials, C 161-44T; 1944. Tentative Specifications for Mortar for Reinforced Brick Masonry. Covers two alternative specifications—(1) property specifications in which the acceptability of the mortar is based on the properties of the ingredients and the properties of the mortar mixture, (2) proportion specifications in which the acceptability of the mortar is based on the properties and fixed proportions of the ingredients. Property specifications cover materials, mortar and grout, water retention, compressive strength, sampling, and methods of testing. Proportion specifications cover materials, and mortar and grout.

American Society for Testing Materials, C 178-44T; 1944. Tentative Specifications for Air-Setting Refractory Mortars (Wet Type) for Boiler and Incinerator Services. Gives scope, classes, quality, test requirements, retests, and methods of testing.

American Society for Testing Materials, D 98-34; 1934. Calcium Chloride. Includes use for dust prevention, acceleration of setting of concrete, and curing concrete. Gives requirements for chemical composition, screen analysis, and packing.

American Standards Assn. A 59.1-1941. Sponsored by Gypsum Assn. and Building Officials Conference of America, Inc. Reinforced Gypsum Concrete. Gives requirements for materials, strength of gypsum concrete, allowable stresses, design, and inspection.

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes requirements for concrete masonry—materials (cement, water, fine and coarse aggregates, and reinforcement to conform to specific A.A.S.H.O. specifications, respectively), care and storage of aggregates, storage of cement, classes of concrete (five classes with class-use recommendations), classification and proportioning of concrete mixtures, consistency, mixing (at site, by truck mixer, by hand), handling and placing, pneumatic placing, pumping, depositing under water, construction joints, rubble or cyclopean concrete, concrete exposed to sea water, concrete exposed to alkali soils or alkali water, falsework, forms and housing, concreting in cold weather, curing concrete, expansion and fixed joints and bearings, finishing concrete surfaces (six classes of finish with class-use recommendations), sidewalk finish, pneumatically applied mortar, and measurement and payment.

American Water Works Assn. Joint sponsor with American Gas Assn., American Society for Testing Materials, and New England Water Works Assn. Cement Mortar Lining for Cast Iron Pipe and Fittings, 1939. American Standards Assn., A21.4-1939. Gives requirements for Portland cement and sand meeting A.S.T.M. specifications, for mixture of mortar, preparation of pipe for lining, method of application and thickness of lining, curing, tests of lining for water absorption, and finish; for optional bituminous outside coatings, whitewash for protection from sun, and for bituminous seal coat; with test for purity of water in lined specimen.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. General Specifications for Materials, Mixing, and Placing of Concrete. Reinforced concrete includes all concrete in which metal, other than that provided for shrinkage or temperature changes, is embedded in such a manner that the two materials act together in resisting forces. Covers drawings, quality of materials, concrete quality, tests, concrete proportions and consistency, mixing and conveying, depositing, forms and conduits, placing of reinforcement, construction joints, cold weather requirements, curing, exposed concrete, waterproof concrete, surfaces, floors, and code of standard practice.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Standard Specifications for 3,000 Lb. Concrete for Structures—Water-Cement Ratio Method. Gives requirements for Portland cement, concrete aggregates, water, storage, concrete quality, proportions based on water-cement ratio for average materials, and curing.

National Lime Assn. Specifications for Mortars for Use in Unit Masonry. Requirements on materials for lime and lime-cement mortars, proportions recommended for general use, below grade and above grade.

National Ready Mixed Concrete Assn. Control of Quality of Ready-Mixed Concrete, 1944. Covers introduction, problems of concrete control, control of concrete at source, batching plants and batching control, mixing control, discharge control, inspection and maintenance of equipment, cold weather concrete, accelerators, tests and test methods, personnel, over-design to meet specifications and appendices; determining percentage of sand by fineness modulus method, determining percentage of sand by voids in coarse aggregate, formulae pertaining to cold weather concrete, and list of references.

Portland Cement Assn. Design and Control of Concrete Mixtures, Seventh Edition, 1940. Covers designing mixtures for definite requirements, proportioning concrete mixtures, design of concrete mixtures, proportioning concrete mixtures by trial, control of concrete in the field, special processes and materials, shrinkage and expansion of concrete, specifications for plain and reinforced concrete, and specifications and tests of the American Society for Testing Materials.

Structural Clay Products Institute. Recommended Mortar for Clay Products Masonry, 1942. Gives mortar ingredients and properties conclusions; recommendations; property specifications for mortar for clay products masonry; proportion specifications for mortar for clay products masonry; recommended mortar for clay products masonry including definition, cementitious materials, plasticizers and admixtures, Portland cement, natural cement, hydraulic hydrated lime, masonry cements, lime, quicklime, hydrated lime, finely ground clay, admixtures, integral waterproofing, color, aggregate, mortar properties, workability and water retentivity, bond, weather resistance or durability, strength, volume change, efflorescence, extensibility and elasticity, permeability, and mortar adapted to masonry units; appendix I giving estimating tables; and appendix II giving standard specifications.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, BH6; 1924. Recommended Minimum Requirements for Masonry Wall Construction. For exterior and interior masonry walls for all buildings, construction requirements recommended by building code committee for adoption by city and state code making bodies. Covers solid brick walls; walls of hollow tile, concrete block, concrete, and stone; hollow walls of brick, veneered walls, requirements on quality of materials, working stresses, thickness, bond, reinforcement, etc.

U. S. Gov., Dept. of the Interior, Bureau of Reclamation. Concrete Manual, 1938. Contains information, advice, and instruction relating to the control of concrete construction—concrete, concrete materials, investigation prior to construction, construction control, and appendixes.

U. S. Gov., Federal Specification HH-M-611a; 1943. Mortar; Air-Setting, Refractory, Bonding (Wet and Dry types). Covers two types—(I) wet and (II) dry; and three grades for each type—(A) high-heat and super-duty, (B) moderate, intermediate and slag-resistant duty, and (C) back-up duty. Gives requirements for material and workmanship, plasticity and preservation, fineness, troweling, dipping, bonding strength, and heat soaking; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Federal Specification HH-M-662; 1944. Mortar; Heat-Setting, Refractory. Covers one type and two grades—(A) super duty and high-heat duty and (B) intermediate and slag resistant duty. Gives requirements for material and workmanship, fineness, bond, linear shrinkage, and pyrometric cone equivalent; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Concrete—Classes A, B, D, and S.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Concrete—Classes XA, XB, XC, XX, XY, and XS.

U. S. Gov., Navy Dept. Specification 32M3b; 1944. Mortar; Refractory, High-Temperature, Air-Setting.

U. S. Gov., Navy Dept. Specification 32M4b; 1944. Mortar; Refractory, High-Temperature, Heat-Setting.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 3Yb; 1929. Standards of Design for Concrete.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 13Yc; 1935. Addendum 1; 1942. Concrete Construction.

References.—Definitions, methods of sampling and of testing, *see* 500, 510., 512.10, 516.0; method of test for refractories, *see* 534.10; gravel, sand, fine aggregate, coarse aggregate, broken stone, slag, *see* 512.11, 512.12, 512.13, 512.14, 512.15, 512.2; cement and lime, *see* 516.1, 517.2; concrete brick, block, cast stone, *see* 516.4; concrete sidewalks, poles, and posts, *see* 516.5, 516.9; concrete road construction, *see* 518.21, 518.31; concrete bridges and piling, *see* 518.4; concrete in building construction, *see* 518.5; concrete drain structures and pipe, *see* 518.6; concrete for tanks and masonry, *see* 518.7, 518.8.

516.4 CONCRETE BRICKS, BLOCKS, AND CAST STONE

American Concrete Institute. Proposed Specification for Cast Stone, 1942. Gives requirements for compressive strength and absorption, selection of specimens for testing, and methods of testing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Concrete Architectural Stone. Gives requirements for composition, tests, working loads and unit stresses, handling, surface finish and carving, cement, sand, lime, mortar, anchors and dowels, setting, cleaning and pointing, protection, and guarantee.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Roadway Protection. Covers retaining structures in sliding cuts. Gives requirements for timber, concrete, and metal cribbing; and dry rubble, masonry, and concrete walls.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Concrete Roofing Tile. Covers two types—(a) small, supported directly on roofing paper and roof sheathing and (b) large, spanning between purlins, interlocking and flat. Gives requirements for materials, manufacture, dimensions, tests, laying, and guarantee.

American Society for Testing Materials, C 55-37; 1937. American Standards Assn., A75.1-1942. Concrete Building Brick. Covers two grades—for exposure to freezing in presence of moisture and for back-up or interior masonry. Requirements as to minimum compressive strengths, modulus of rupture, dimensions of standard size, inspection, and tests in accordance with A.S.T.M. method C 67.

American Society for Testing Materials, C 90-44; 1944. American Standards Assn., A79.1-1944. Hollow Load-Bearing Concrete Masonry Units. For units for wall construction made from Portland cement and suitable aggregates such as sand, gravel, crushed stone, cinders, burned clay or shale, and blast furnace slag. Covers cinder aggregate, physical requirements, permissible variations in dimensions, visual inspection, marking, sampling and testing, rejection, and expense of tests.

American Society for Testing Materials, C 129-39; 1939. American Standards Assn., A80.1-1942. Hollow Nonload-Bearing Concrete Masonry Units. Covers compressive strength and moisture content of tile as delivered, nature of aggregate, dimensions and permissible variations, visual inspection, marking, and sampling.

American Society for Testing Materials, C 139-39; 1939. American Standards Assn., A73.1-1942. Concrete Masonry Units for Construction of Catch Basins and Manholes. For solid, precast, segmental units made from Portland cement and suitable aggregates. Specifies minimum compressive strength, maximum absorption, dimensions and permissible variations, visual inspection, marking, sampling and testing.

American Society for Testing Materials, C 140-39; 1939. American Standards Assn., A 84.1; 1942. Methods of Sampling and Testing Concrete Masonry Units. Methods for determining compressive strength, absorption, weight, and moisture content. Includes selection of samples and outline of procedure for tests.

American Society for Testing Materials, C 145-40; 1940. American Standards Assn., A81.1-1942. Solid Load-Bearing Concrete Masonry Units. Covers cement block or tile having 75 percent or more net area with suitable aggregates such as sand, gravel, crushed stone, bituminous or anthracite cinders, burned clay or shale, and blast-furnace slag. Gives limits for combustible content in aggregate, physical requirements, dimensions and permissible variations, and visual inspection.

Underwriters' Laboratories, Inc. Standard for Concrete Masonry Units, 1938. Covers units which have been shown by fire tests to be eligible for fire retardant classifications under standard fire exposure conditions as specified in the American Standard Fire Test Specifications. Design, dimensions, materials, cement-aggregate proportion, strength, consistency, curing methods, and fire endurance tests.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation

R32-38; 1938. Concrete Building Units. This recommendation covers dimensions of concrete block, tile, and brick. Sponsored by the American Concrete Institute, National Concrete Masonry Assn., and Portland Cement Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS53-35; 1935. Colors and Finishes for Cast Stone. This standard covers those colors and finishes which constitute a very large proportion of the production of the cast stone industry. As the demand arises this standard may be extended to include other colors and finishes. This standard includes a table setting forth standard colors and finishes for cast stone. It was approved as American Tentative Standard CS53-35 by the American Standards Assn. Sponsored by the Cast Stone Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS21; 1939. Structural Properties of a Concrete-Block Cavity-Wall Construction Sponsored by the National Concrete Masonry Assn. The Association submitted 12 specimens representing a concrete-block cavity-wall construction. The specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. For each of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented graphically and in a table.

U. S. Gov., Federal Specification SS-B-663; 1932. Brick; Concrete. Covers three grades—(H) hard, (M) medium, and (S) soft; of Portland cement mortar or concrete. Gives requirements for material, workmanship, absorption, and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-C-621; 1931. Amendment 1; 1935. Concrete-Units; Masonry, Hollow. Covers two types for wall construction—(I) load bearing and (II) nonload bearing. Gives requirements for material, workmanship, and compressive strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-S-721; 1931. Stone; Architectural, Cast. Covers material intended as interior and exterior architectural finish or decorations for buildings or other structures; two types—(I) cast stone, homogeneous throughout, and (II) cast stone, with not less than 1 in. of facing. Gives requirements for material, workmanship, construction, and marking; and methods of sampling, inspection, and tests.

U. S. Gov., Navy Dept. Specification 42W2; 1943. Weights; Ballast.

References.—Definitions, methods of sampling and of testing, see 500, 510, 512.10, 516.0; methods of sampling and testing clay brick and fire clay brick, see 534.10; gravel, sand, fine aggregate, coarse aggregate, broken stone, slag, see 512.11, 512.12, 512.13, 512.14, 512.15, 512.2; cement, see 516.1; concrete brick and blocks in building construction, see 518.5.

516.5 CONCRETE SIDEWALKS AND DRIVEWAYS

American Public Works Assn. Specification for Concrete Sidewalks, C1-36; 1936. For use in residence and business districts, either one- or two-course sidewalks; includes preparation of sub-base, laying and finishing, and protection during hardening. Gives requirements for cement and aggregates, tested in accordance with A.S.T.M. methods.

Portland Cement Assn. Concrete Walks, Driveways, Aprons, Terraces, Porch Floors, and Retaining and Garden Walls, 1940. Suggestions for one-course walk construction, concrete topping, precast concrete flagstone, proportions, coloring, finishes, and curing, with illustrations of procedures.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Concrete Sidewalk.

References.—Definitions, methods of sampling and of testing, see 500, 510, 512.10, 516.0; gravel, sand, fine aggregate, coarse aggregate, broken stone, slag, see 512.11, 512.12, 512.13, 512.14, 512.15, 512.2; cement, see 516.1.

516.9 MISCELLANEOUS SPECIFICATIONS FOR CEMENT AND CONCRETE

American Public Works Assn. Sewers, J1-38; 1938. Includes standard and high-early-strength Portland cements, storage, inspection, concrete sewer pipe, plain and reinforced, form work, concrete piles, quality of water for mixing concrete, concrete masonry construction, work in freezing weather, proportions and consistency, depositing concrete under water, vibration and concrete vibrators, construction joints, curing, general qualities of concrete finish, granolithic mixtures, reinforcement, built in place concrete sewers, plastering of concrete surfaces, and requires tests for materials using A.S.T.M. methods.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Brickwork. Gives requirements for cast concrete.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Concrete Fence Posts. Gives requirements for materials, proportioning and mixing, molds, placing reinforcing, compacting, finish, curing, inspection, tests, and patents.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Pile Foundations. Covers the investigation, design, and construction of pile foundations. Gives requirements for concrete piles—pre-cast and cast-in-place.

merican Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Shotcrete. Gives requirements for bonding surface, reinforcement, dowels, shotcrete, shooting strips, application, and curing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Roadway Protection. Covers retaining structures in sliding cuts. Gives requirements for timber, concrete, and metal cribbing; and dry rubble, masonry, and concrete walls.

American Water Works Assn. Tentative Emergency Specifications for Reinforced Concrete Pressure Pipe, 7B-T-1943. Covers type, designation, size range, minimum design head, maximum operating head, and materials and methods used in construction. Gives requirements applying to all types, steel cylinder reinforced concrete pressure pipe, noncylinder reinforced concrete pressure pipe, and centrifugal reinforced concrete pressure pipe.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-41; 1930. Concrete Telephone Booth. For housing telephone equipment at outlying points along railroads, unit or sectional, requirements for reinforcing, workmanship, and includes dimensional drawing.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS43; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 2. In the second series, 40 test installations were subjected to a performance test in the floor-testing chamber of the National Bureau of Standards. Included in the tests were battleship linoleum, rubber in sheet and tile form, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of asphalt tiles. The bonding agents used included lignin pastes, resinous cements, latex adhesives, rubber cements, cut-back asphalt, and asphalt emulsions. Installations were made on both concrete and wood subfloors. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries showing the performance of the test panels are given, and the appearance of the different floor coverings after 48,000 cycles of the testing equipment is shown by representative photographs.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar-resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, stripwood, and plywood subfloors. Installations on strip-wood subfloors were made with underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given, and photographs of the test panels, after 48,000 cycles of the testing equipment, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS73; 1941. Indentation Characteristics of Floor Coverings. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65-percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevated temperature of 90° F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedure are briefly described. Summaries of the results are presented to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 26 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were cork tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given, and their appearance at the end of the test is shown by photographs. A few generalized comments and conclusions are made.

U. S. Gov., Federal Specification SS-P-371; 1937. Pipe; Concrete, Non-Pressure, Non-Reinforced, and Reinforced. Covers two types—(I) nonreinforced of bell and spigot pattern, and (II) reinforced. Gives requirements for materials, workmanship, dimensions, strength, and design; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov. Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Culverts and Retaining Walls.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10, 516.0; gravel, sand, fine aggregate, coarse aggregate, broken stone, slag, *see* 512.11, 512.12, 512.13, 512.14, 512.15, 512.2; cement, *see* 516.1; concrete in road construction, *see* 518.21, 518.31; concrete in bridge and building construction, *see* 518.4, 518.5; concrete drainage structures and pipe, *see* 518.6; concrete tanks and masonry, *see* 518.7, 518.8; concrete burial vaults, *see* 959.3.

517. LIME

517.0 GENERAL ITEMS

American Society for Testing Materials, C 50-27; 1927. Methods of Sampling, Inspection, Packing, and Marking of Quicklime and Lime Products. Requirements for securing of samples; for lump or granular material in bulk, in packages; for powdered material in bulk or packages; treatment of sample, inspection, packing and marking.

American Society for Testing Materials, C 51-44; 1944. Definitions of Terms Relating to Lime. Defines lime, quicklime, lump lime, lump lime screened, pulverized lime, hydrated lime, liming material, air-slaked lime, calcia, magnesia, building or construction lime, chemical lime, agricultural lime, and available lime.

American Society for Testing Materials, C 51-44T; 1944. Tentative Definitions of Terms Relating to Lime. Defines run-of-kiln quicklime, quicklime sizes, hydraulic hydrated lime, high-calcium hydraulic hydrated lime, and high-magnesium hydraulic hydrated lime.

American Society for Testing Materials, C 110-38T; 1938. Tentative Methods of Physical Testing of Quicklime and Hydrated Lime. For determination of residue of quicklime and hydrated lime, for standard consistency of lime putty, plasticity of lime putty by use of the Emley plasticimeter, and for constancy of volume.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Lime; Chemical. Covers definition, solubility, impurities, grades, packing, uses, and inspection.

517.1 LIME

References.— Lime, quicklime, and hydrated lime, *see* 517.2.

517.2 HYDRATED LIME AND QUICKLIME

American Ceramic Society. Journal of A.C.S. for June 1928. U. S. National Bureau of Standards. Circular 118. Adopted by A.C.S. in 1924. Limestone, Quicklime, and Hydrated Lime. Use of lime in manufacture of glass, definitions, requirements on chemical composition of nonvolatile portion of limestone, quicklime or hydrated lime, fineness, methods of sampling and testing.

American Leather Chemists Assn. Methods of Sampling and Analysis. Lime, 1942. Gives requirements for available calcium oxide, gravimetric analysis lime or limestone, acid insoluble siliceous matter, iron and aluminum oxides, iron oxide, calcium oxide, magnesium oxide, and sulfur trioxide.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Hydrated Lime To Be Used in Water Treatment. Covers two grades—high-calcium and calcium. Gives requirements for chemical and physical properties and tests, packing, inspection, penalization, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Quicklime To Be Used in Water Treatment. Covers two grades—high-calcium and calcium; and four forms—lump, pebble, ground, and pulverized. Gives requirements for chemical properties and tests, packing, inspection, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Brickwork. Gives requirements for lime.

American Society for Testing Materials, C 5-26; 1926. Quicklime for Structural Purposes. Includes crushed, granular, ground, lump, pebble, and pulverized calcium or magnesium quicklime for structural purposes. Requirements for chemical composition, fineness of residue from slaking test, sampling and inspection, with tests by A.S.T.M. methods. Includes directions for slaking and preparation of lime putty for use.

American Society for Testing Materials, C 6-44; 1944. Normal Finishing Hydrated Lime. Covers finishing hydrated lime for scratch, brown, and finish coats of plaster; for stucco, mortar, and as an addition to Portland cement concrete. Gives chemical composition, residue, soundness, plasticity, sampling, inspection, and methods of testing.

American Society for Testing Materials, C 25-44; 1944. Methods of Chemical Analysis of Limestone, Quicklime, and Hydrated Lime. Covers scope, analysis, special solution required, insoluble matter, silicon dioxide, iron and aluminum oxides, total iron, calcium oxide, strontium oxide, magnesium oxide, loss on ignition, mechanical moisture carbon dioxide, sulfur trioxide, total sulfur, phosphorus, manganese, ferrous iron, available lime index, and appendix.

American Society for Testing Materials, C 45-25; 1925. Quicklime and Hydrated Lime for Cooking of Rags in Paper Manufacture. Requirements as to chemical composition of quicklime or hydrated lime, economic considerations for higher or lower limits, and tests according to A.S.T.M. method C 25.

American Society for Testing Materials, C 46-27; 1927. Quicklime for Sulfite Pulp Manufacture. For "Milk of Lime" or "Tank System" for use in making the cooking liquor. Limiting percentages of calcium and magnesium oxides; oxides of silicon, iron, and aluminum; and tests according to A.S.T.M. method C 25.

American Society for Testing Materials, C 47-27; 1927. Hydrated Lime for Varnish Manufacture. For oleoresinous varnishes, general requirements, chemical composition, fineness, reactivity, tung-oil heat test, sampling, and inspection.

American Society for Testing Materials, C 48-24; 1924. Quicklime and Hydrated Lime for Use in the Textile Industry. For treatment of cotton, linen, and jute for liming the kiers, boiling out or scouring, and for bleaching. Gives general requirements, chemical composition, and tests according to A.S.T.M. method C 25.

American Society for Testing Materials, C 49-42; 1942. Quicklime and Hydrated Lime for Silica Brick Manufacture. Requirements on percentages of oxides of calcium, magnesium, iron and aluminum, silica, insoluble matter, and of carbon dioxide, using test by A.S.T.M. method C 25.

American Society for Testing Materials, C 53-39; 1939. Quicklime and Hydrated Lime for Water Treatment. For purification and softening of water for municipal and industrial purposes; general requirements, available lime percentages for quicklime and hydrated lime, and sampling and inspection.

American Society for Testing Materials, C 141-42; 1942. Hydraulic Hydrated Lime for Structural Purposes. For scratch or brown coat plaster, for stucco, cementitious material in concrete, or for admixture in Portland cement concrete, either high calcium, or magnesium hydraulic hydrate. Requirements for chemical composition, fineness, time of setting, soundness, compressive strength, sampling, and methods of test.

Contracting Plasterers' International Assn. Standard Specification. Includes requirements for lime.

Technical Assn. of the Pulp and Paper Industry. Analysis of Lime, Standard T 617 m-44; 1944. Quicklime (Unslaked Lime) and Hydrated (Slaked Lime). This association has adopted the following specifications of the American Society of Testing Materials: for use in cooking rags, standard C45-25; for use in sulphite pulp manufacture, standard C46-27; and for use in water treatment, standard C53-39. Covers sampling and analysis.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C231; 1925. Quicklime and Hydrated Lime for Use in the Purification of Water. Approved by the Interdepartmental Conference on Chemical Lime. Requirements on percentage of available lime in quicklime and of available calcium hydroxide in hydrate lime, methods of sampling and testing.

U. S. Gov., Federal Specification SS-L-351; 1930. Lime; Hydrated (for) Structural Purposes. Covers two types—(M) masons and (F) finishing. Gives requirements for chemical composition, fineness, soundness, and plasticity; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-L-361; 1928. Amendment 1; 1939. Lime; Hydraulic, Hydrated. Covers two types—(C) calcium and (M) magnesium; with or without water-repellent additions. Gives requirements for chemical composition, fineness, strength, time of setting, soundness, water retention, and water repellency; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-Q-351; 1930. Quicklime; (for) Structural Purposes. Covers two types—(C) calcium and (M) magnesium. Gives requirements for material and workmanship, chemical composition, and waste; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-245A; 1941. Lime; Hydrated (for Soda Lime).

References.—Definitions, method of sampling and of testing, *see* 500, 517.0; lime for fertilizer, *see* 859; lime whitewash, *see* 843.5.

518. CONSTRUCTION WORK

518.0 GENERAL ITEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Test Borings. Gives requirements for plant, depth, exploration methods, records, samples, and inspection; and sample page of test boring data.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Uniform General Contract Forms. Proposal, construction contract, cost-plus percentage construction contract.

American Society for Testing Materials, D 426-39; 1939. Method of Test for Field Moisture Equivalent of Soils. For determination of the minimum moisture content at which a drop of water placed on a smoothed surface of the soil is not immediately absorbed. Describes evaporator, selection of sample, method of adding water, and oven drying to obtain percentage of field moisture.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 7.16 (1938), 7.17, 7.18, 7.19, and 7.20 (1939). Anchorage of Steel-Deck Roofs. A series of bulletins showing details of wind-anchorage methods for various types of steel-deck roofs.

Associated General Contractors of America. Manual, 1925. Includes contract forms for engineering construction, building contract of the American Institute of Architects, subcontract form, standard municipal contract, standard government contract (U.S. standard form No. 23), A.G.C. cost plus fee contract, highway contract approved provisions, construction service contract, equipment rental contract, A.G.C. proposal form, and separate contracts—government decision.

Associated General Contractors of America. Manual, 1926. Includes highway estimate sheets, building estimate summary forms, contractors' equipment ownership expense (revised, 1938), equipment record forms, standard prequalification questionnaires and financial statements for prospective bidders (1933), financial statement and questionnaire for credit transactions, advantages of winter construction, functions of general contractor, classification of construction occupations (1935), and code of ethics.

Associated General Contractors of America. American Standards Assn., A 10.1-1939. Manual of Accident Prevention in Construction, 1938. Gives safe practices on construction work; including first aid, for excavation, explosives, demolition, hoists and derricks, pile driving, concreting, scaffolding, barricades, shoring, boilers and pressure vessels, trucks and railroad track usage, fire prevention, tunneling, road construction, electrical equipment, protection of the public, and occupational diseases.

U. S. Gov., Federal Housing Administration. Minimum Construction Requirements. These requirements provide a Minimum Standard of Construction and shall apply to all new construction on which the mortgage is insured by the Federal Housing Administration. They are considered necessary to produce a well-constructed dwelling which will serve as sound security for a long-term mortgage loan. Since these requirements are essentially minimum, they are not to be built down to but form a basis from which to build up. Copies are available in the F.H.A. insuring offices throughout the U. S. Include requirements for excavation, masonry, adobe construction, structural steel and iron, lumber, wood framing, termite prevention, roof coverings, sheet metal, lathing, plastering, stucco, painting, plumbing, heating, electrical work, etc., according to geographical location and local building code requirements.

U. S. Gov., Federal Specification SS-R-406a; 1942. Amendment 1; 1944. Road and Paving Materials; General Specifications (Methods for Sampling and Testing). Gives methods of sampling and testing that are used officially in the routine examination of certain road and paving materials covered by federal specifications.

References.—Safety code for building construction, *see* 518.50.

518.1 GRADING FOR ROADS

518.10 General Items

American Assn. of State Highway Officials. A Policy on Intersections at Grade, 1940. Covers introduction, definitions, type of intersection, assumed design vehicles, designs for edge of pavement on curves at intersections, minimum right-angle intersections, minimum oblique-angle intersections, separate turning lanes, flared intersections, acceleration and deceleration lanes, islands and channels, alinement and grades at intersections, sight distance at intersections, location of signs at intersections, illustrative existing intersections, approved conclusions, illustrations, and tables.

American Assn. of State Highway Officials, M57-42. Standard Specifications for Materials for Embankments and Subgrades. Gives scope, definitions, general requirements, and methods of testing.

American Assn. of State Highway Officials, T86-42. Standard Methods of Surveying and Sampling Soils for Highway Subgrades. Gives purpose of subgrade survey, scope of subgrade survey, equipment for subgrade survey, soil profile determination, examination of soil section, selection of samples, mapping the soil profile, and analysis of data.

American Assn. of State Highway Officials, T87-42. Standard Methods of Preparing Disturbed Soil Samples for Test. This method describes the preparation of soil samples as received from the field for mechanical analysis, the determination of the soil characteristics, and the compaction test. Gives apparatus, size of sample, preparation of sample, test sample for mechanical analysis, test sample for subgrade soil constants, and test sample for the compaction test.

American Assn. of State Highway Officials, T93-42. Standard Methods of Determining the Field Moisture Equivalent of Soils. The field moisture equivalent of a soil is the minimum water content at which a drop of water placed on a smooth surface of the soil will not be completely absorbed in 30 seconds. Gives apparatus, sample, procedure, and calculation.

American Petroleum Institute, Division of Production. Code 26; 1935. Recommended Practice on Form of Agreement and Specifications for Pipe-line Crossings Under Railroad Tracks.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Formation of the Roadway. Gives requirements for construction, alignment, grade, cross-section, clearing and grubbing, grading, and work in vicinity of operated tracks.

American Society for Testing Materials, D 420-42T; 1942. Tentative Methods of Surveying and Sampling Soils for Highway Subgrades. Covers purpose, scope, and equipment for subgrade survey, soil profile determination, examination of soil section, for roads in service and new roads, typical survey sheets, and analysis of data.

American Society for Testing Materials, D 421-39; 1939. Method of Preparing Soil Samples for Mechanical Analysis and Determination of Subgrade Soil Constants. For samples as received from the field; requirements for preparing sample, apparatus, test samples for mechanical analysis, and for subgrade soil constants.

American Society for Testing Materials, D 558-44; 1944. Method of Test for Moisture-Density Relations of Soil-Cement Mixtures. For relationship between moisture content of soil-cement mixtures and resulting densities (oven-dry weight) when mixture is compacted in the laboratory, before cement hydration. Gives apparatus required, method of procedure, and calculation of moisture-density relationship.

American Society for Testing Materials, D 559-44; 1944. Method of Wetting-and-Drying Test of Compacted Soil-Cement Mixtures. For determining soil-cement losses, moisture changes, swell and shrinkage produced by repeated wetting and drying of compacted specimen. Covers apparatus required, preparation of material and molding of specimen, and outline of procedure.

American Society for Testing Materials, D 560-44; 1944. Method of Freezing-and-Thawing Test of Compacted Soil-Cement Mixtures. For determining soil-cement losses, moisture changes, swell and shrinkage produced by freezing and thawing compacted specimen. Gives apparatus required, preparation of material and molding of specimen, and outline of procedure.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes clearing and grubbing; random clearing; random grubbing; selective removal of trees and snags; stripping and storing topsoil; roadway and drainage excavation; unclassified excavation for structures; borrow; overhaul; and special overhaul of borrow.

518.11 Roadway Preparation

American Public Works Assn. Specification for Earth Subgrade, B1-36; 1936. Covers grading and preparation of earth subgrades for pavement foundations, including stakes, excavating, fill, rock, drainage, rolling, and temporary crossings.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Obliteration of Old Roadways and Roadside Clean-up (Wooded Areas).

References.—Definitions, methods of sampling and of testing, *see* 518.0, 518.10.

518.12 Excavation and Embankment

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Construction, Excavation, and Temporary Lining of Tunnels. Gives requirements for laying out work, sanitary provisions, excavation, change in area on account of curvature, slides and falls, excavation below grade, refuge niches, shafts, classification, disposition of material and overhaul, wiring, blasting, drainage, timber lining, packing, portals, ventilation, and lighting.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes embankment; foundation fill; backfill for structures other than pipe culverts; bedding for backfill for pipe culverts; disposal of surplus material; replacing topsoil; tree wells and tree root protection; and furrow ditches.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes hand-laid rock embankment.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 4Yd; 1939. Construction of Portland Cement Concrete Pavements. Includes requirements for clearing and earthwork.

References.—Definitions, methods of sampling and of testing, *see* 518.0, 518.10.

518.13 Slopes and Shoulders for Roads

References.—Definitions, methods of sampling and of testing, *see* 518.0, 518.10; gravel, broken stone, slag for shoulders, *see* 512.11, 512.15, 512.2.

518.14 Subbases for Roads

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes spot subgrade reinforcement; subgrade; finishing earth graded roads; and fine grading subgrade and shoulders.

References.—Definitions, methods of sampling and of testing, *see* 518.0, 518.10; other specifications for subbases and foundations, *see* 518.2; gravel, broken stone, slag, *see* 512.11, 512.15, 512.2.

518.2 FOUNDATION FOR ROADS

518.20 General Items

American Transit Assn. Recommended Design of Proper Foundation for Tracks in Paved Streets, W102-23; 1923.

518.21 Cement Concrete Foundation for Roads

American Public Works Assn. Specification for Pavement Foundation of Portland Cement Concrete, B4-36; 1936. Gives requirements for spreading of concrete on foundation prepared in accordance with A.P.W.A. Specification B1-36, materials to comply with A.S.T.M. specifications.

American Society for Testing Materials, D 58-37; 1937. Materials for Sand-Cement Bed for Brick and Block Pavements. For brick, stone block, wood block, asphalt block, and other block pavements; requirements for quality of sand, sieve analysis, Portland cement mortar strength, and testing by A.S.T.M. methods.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10, 518.0, 518.0, 518.10; street railway foundation, *see* 518.20; sand, gravel, broken stone, slag, *see* 512.1, 512.2; cement and concrete, *see* 518.1, 516.3; preparation of roadway, *see* 518.11, 518.12.

518.22 Telford Foundation for Roads

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Telford Base Course.

References.—Definitions, methods of sampling and of testing, *see* 510; preparation of roadway, *see* 518.11, 518.12.

518.23 Macadam Foundation for Roads

American Public Works Assn. Specification for Pavement Foundation of New Macadam, B2-36; 1936. Includes mineral aggregates composed of coarse aggregates and filler tested in accordance with A.S.T.M. methods, construction, compacting, and admission of traffic.

American Public Works Assn. Specification for Pavement Foundation of Reconstructed Macadam, B3-36; 1936. For scarifying old macadam, adding of coarse aggregate and filler, construction methods, and quality of materials.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Waterbound Macadam Base Course.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10; sand, gravel, and broken stone, *see* 512.1; slag, *see* 512.2; slag foundation, *see* 518.28; bituminous macadam foundation, *see* 518.25; asphaltic foundation, *see* 518.27; broken stone foundation, *see* 518.24; ballast, *see* 511.73; preparation of roadway, *see* 518.11, 518.12.

518.24 Broken Stone Foundation for Roads

U. S. Gov., Federal Specification SS-M-51; 1931. Materials; (for) Cushion Course, Brick, Stone-Block, or Wood-Block Pavements (Sand, Slag, Limestone, Screening, Etc.) Covers sand, granulated slag, slag screenings, and limestone screenings. Gives requirements for material and grading and methods of sampling and testing.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Crushed Gravel or Crushed Stone Base Course.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Reconstructed Stone or Gravel Base Course.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10; broken stone, *see* 512.15; ballast, *see* 511.73; telford foundation, *see* 518.22; macadam foundation, *see* 518.23; bituminous macadam foundation, *see* 518.25; asphaltic foundation, *see* 518.27; preparation of roadway, *see* 518.11, 518.12.

518.25 Bituminous Macadam Foundation for Roads

American Public Works Assn. Specification for Pavement Foundation of Tar Macadam (Cold Penetration Type), B7-36; 1936. For materials and methods of construction, including requirements for refined tar for cold application, tested in accordance with A.S.T.M. methods.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bituminous Macadam Base Course (Asphalt or Tar).

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Reconditioning of Used Roadbed (Preparatory To Bituminizing).

References.—Other bituminous (asphalt) macadam base courses, *see* 518.27; definitions, methods of sampling and of testing of bituminous materials, *see* 502.2, 505.0, 505.30; definitions, methods of sampling and of testing of nonbituminous materials, *see* 500, 510, 512.10; sand, gravel, broken stone, *see* 512.1; slag, *see* 512.2; asphalts, road oils, tar, *see* 505.1, 505.2, 505.3; preparation of roadway, *see* 518.11, 518.12; bituminous concrete foundation, *see* 518.26.

518.26 Bituminous Concrete Foundation for Roads

American Public Works Assn. Specification for Pavement Foundation of Tar Macadam (Hot Penetration Type), B6-36; 1936. For materials and methods of construction, including requirements for refined tar, tested in accordance with A.S.T.M. methods, crushed stone, and for block pavement surface course preparation of sand-tar cushion.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Hot Bituminous Concrete Base Course.

References.—Other bituminous (asphalt) concrete foundations, *see* 518.27; definitions, methods of sampling and of testing bituminous materials, *see* 502.2, 505.0, 505.30; definitions, methods of sampling and of testing nonbituminous materials, *see* 500, 510, 512.10; bituminous macadam foundation, *see* 518.25; sand, gravel, and broken stone, *see* 512.1; slag, *see* 512.2; asphalts, road oils, tar, *see* 505.1, 505.2, 505.3; preparation of roadway, *see* 518.11, 518.12.

518.27 Asphaltic Foundation for Roads

American Public Works Assn. Specification for Pavement Foundation of Asphaltic Concrete, B-5; 1936. For materials and methods of construction including requirements for asphalt cement, tests in accordance with A.S.T.M. methods, preparation and composition of asphaltic base mixture, and formation of joints.

American Public Works Assn. Specification for Pavement Foundation of Asphalt Macadam, B9-36; 1936. Describes materials and methods of construction, including mineral aggregate, asphalt cement, tests in accordance with A.S.T.M. methods, heating and distributing of asphalt cement.

References.—Other asphaltic (bituminous) foundations, *see* 518.25, 518.26; definitions, methods of sampling and of testing bituminous materials, *see* 502.2, 505.0; definitions, methods of sampling and of testing nonbituminous materials, *see* 500, 510, 512.10; sand, gravel, broken stone, *see also* 512.1; slag, *see* 512.2; asphalt, road oils, *see* 505.1, 505.2; preparation of roadway, *see* 518.11, 518.12.

518.28 Slag Foundation for Roads

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Dry Choked Stone or Slag Base Course.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10; slag, *see* 512.2; preparation of roadway, *see* 518.11, 518.12.

518.29 Miscellaneous Specifications for Foundations for Roads

American Public Works Assn. Specification for Pavement Foundation of Reconstructed Brick, Block, or Concrete Pavement, B8-36; 1936. For use of worn pavement as base for new surface by filling depressions with asphaltic concrete, including preparation, placing, and compacting.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Gravel Base Course.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Reconstructed Stone or Gravel Base Course.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Selected Borrow Base Course.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Sledged Stone Base Course.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Stabilized Soil Base Course.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10, 518.0, 518.10; rock and stone, *see* 511.7; sand, gravel, and broken stone, *see* 512.1; slag, *see* 512.2; preparation of roadway, *see* 518.11, 518.12.

518.3 PAVEMENT SURFACES

518.30 General Items

American Assn. of State Highway Officials. A Policy on Criteria for Marking and Signing No-Passing Zones on Two- and Three-Lane Roads (Standards for Marking and Signing No-Passing Zones), 1940. Covers introduction, assumed design speed, no-passing zones in opposite directions, sight distance at no-passing zones, locating no-passing zones, no-passing zones approaching intersections, relation of limits of no-passing zones to P.I. of vertical curves for purpose of marking pavements, transitions between roads having different numbers of traffic lanes, approved conclusions, and standards for marking and signing no-passing zones.

American Assn. of State Highway Officials. A Policy on Highway Classification, 1940. Covers introduction, class designation, traffic density, assumed period of time, approved traffic density, traffic capacity, character of traffic, assumed design speed, and list of references.

American Assn. of State Highway Officials. A Policy on Highway Types (Geometric), 1940. Covers introduction, the traffic lane, shoulders, guardrails and curbs, parking lanes, sidewalks, highways with single-lane surfaces, two-lane highways, three-lane highways, four-lane highways, dividing the four-lane highway, median strips at intersections at grade, median strips in general, crown and superelevation, effects of grade separations, effects of service roads, approved conclusions, and illustrations.

American Assn. of State Highway Officials. A Policy on Intersections at Grade, 1940. Covers introduction, definitions, type of intersection, assumed design vehicles, designs for edge of pavement on curves at intersections, minimum right-angle intersections, minimum oblique-angle intersections, separate turning lanes, flared intersections, acceleration and deceleration lanes, islands and channels, alinement and grades at intersections, sight distance at intersections, location of signs at intersections, illustrative existing intersections, approved conclusions, illustrations, and tables.

American Assn. of State Highway Officials. A Policy on Rotary Intersections, 1942. Covers introduction, advantages and disadvantages of rotaries, traffic conditions favorable to rotary design, principles of rotary design, speed of rotary movement, distance between radial roads, the central island, the rotary roadway, outer curb outline, entrance and exits, directional islands, roadway cross slopes, sight distance and grades, curbs and shoulders, landscape development, signs, pavement stripes or markers, lighting, stop-and-go control, examples and adaptations of rotary design, approved conclusions, and illustrations.

American Assn. of State Highway Officials. A Policy on Sight Distance for Highways, 1940. Covers introduction, non-passing minimum sight distance, perception and brake reaction time, braking distance, effect of grade, safe passing sections, passing minimum sight distance, perception time, speed and number of overtaken vehicles, spacing of moving vehicles, acceleration of vehicles, speed of opposing traffic, passing sight distance two-lane highways, passing sight distance three-lane highways, effect of grade, sight distance for four-lane highways, extra lanes for passing, height of eye and object, measuring sight distance, recording sight distance, general application, approved conclusions, and addenda.

American Society for Testing Materials, D 290-39; 1939. Recommended Practice for Bituminous Paving Plant Inspection. Defines the duties and authority of the inspector at a paving plant, engineer, contractor, laboratory, and plant laboratory. Outlines position of inspector, plant equipment and operation, sampling, preparation of mixtures, plant testing of materials, and form of report.

Calcium Chloride Assn. Bulletin 26; 1942. Soil—Aggregate Stabilization and the Use of Calcium Chloride for Military Roads and Airport Runways. Covers dustless, firm military roads and runways, growth of road stabilization, stabilized mixtures for military roads and airports, use of calcium chloride in road construction practice, chart of mechanical stabilization procedure, consolidating gravel surfaces using mix-in-place methods, consolidated runway at Selma Airport, Kankakee Ordnance Plant roads, stabilizing effects of calcium chloride, and value of calcium chloride in concreting.

Calcium Chloride Assn. Bulletin 27; 1942. Skidproofing Icy Roads and Streets—Calcium Chloride in Ice Control Practice. Covers cold weather map of the U. S., ice control policy and practice, skid tests data, freeze-proofing and embedment values, abrasive preparation and pre-treatment, ice treating properties, skidproofing value of calcium chloride in abrasives, ice melting rates of calcium and sodium chlorides, calcium chloride treatment, economic advantage of treated abrasives, spreading rate and effectiveness, placement and storage of abrasives, organized ice treating operations, preventing formation of ice, ice removal—roads and streets, other locations, and table of freezing points.

Calcium Chloride Assn. Bulletin 29; 1942. Surface Consolidation and Maintenance With Calcium Chloride. For low-cost roads and base development emergency roads and airport runways. Covers highway development through maintenance, surface consolidation described, consolidation objectives, planning and preparation for surface consolidation, importance of proper binder-soil, test procedure for controlled proportioning, determination of quantity of soil fines, "rule-of-thumb" methods, essentials in mixing and placing operations, moisture is a critical factor, use of calcium chloride, stabilizing effects of calcium chloride, economics of maintenance with calcium chloride, maintenance of consolidated roads, resurfacing with prestabilized material, and extended fields for surface consolidation.

Calcium Chloride Assn. Brief 179. Dust Control With Calcium Chloride. For tennis courts, playgrounds, parks and cemeteries, driveways, parking areas, factory yards, and drive-in theaters. Covers dust—a serious problem, sprinkling not lasting, calcium chloride holds moisture, binds dust, spreading is simple, soil variation and weather factors, for highway maintenance, for dustproofing drives, street frontages and playgrounds, general recommendations, and packing and shipping.

Highway Research Board. Use of Calcium Chloride in Road Stabilization, 1938. Covers calcium chloride, principles of stabilization, mixture design specifications, computing quantities, properties of calcium chloride and how they function in road stabilization, calcium chloride stabilization types, surface consolidation by maintenance methods, construction of designed stabilized roads, construction costs, maintenance, utility of calcium chloride roads as future bases, research and references.

National Sand and Gravel Assn. Circular 13; 1935. The Use of Gravel in Cement Bound Macadam. Gives a general discussion of the use of gravel in cement bound macadam together with a history of the subject and recent findings.

Structural Clay Products Institute. Mason's Handy Guide. Gives mortar recommendations, mortar proportions, weights of materials, and tables for estimating number of bricks, cubic feet of mortar, number of hollow wall tile, and quantities of lump quicklime, pulverized quicklime, and hydrated lime required.

518.31 Cement Concrete Pavements

American Public Works Assn. Specification for Portland Cement Concrete Pavement, F1-39; 1939. For concrete and reinforced concrete pavements; requirements for cement and aggregates tested in accordance with A.S.T.M. methods, water, reinforcement, steel including wire fabric, bars, bar mats, dowel and tie bars, and deformed metal plate, joint fillers, premolded and poured-in-place types, cork expansion joints, joints, metal and wood forms, curb and gutter, proportioning concrete, mixing, depositing, hand and machine finishing, curing, and appendix covering recommendation of design, A.S.T.M. specifications applicable to materials and methods of test, definitions, and sampling.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Concrete Pavements and Foundations. Gives requirements for grading, subgrade, curbing, joint filler, forms, joints, expansion joints, placing reinforcement, placing and finishing concrete, curing and protection, and guarantee.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Construction of Monolithic Concrete Crossings. Gives requirements for design of crossing, rail fillers, end crossing, concrete, and steel.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Construction of Precast Concrete Slab Crossings. Gives requirements for design, materials, installation, loading, flangeways, outside of rail head, anchorage, variable depth, concrete, steel, ties, shines, and bevel strips.

American Society for Testing Materials, C 175-44 T; 1944. Tentative Specifications for Air-Entraining Portland Cement for Concrete Pavements. For use in concrete pavements exposed to severe frost action. Covers basis of purchase, definition, chemical requirements, physical requirements, packaging and marking, storage, inspection, rejection, and methods of testing.

Portland Cement Assn. Concrete Pavement Inspector's Manual, 1940. Covers your job, sampling and testing aggregates, at the proportioning plant, form setting, preparing the subgrade, joints, at the mixer, finishing the surface, curing, tests for concrete, curb and gutter, cold weather construction, and city pavements.

Portland Cement Assn. Concrete Pavement Manual of Suggested Practice for Office and Field, Third Edition, 1942. Covers design of concrete pavements including width, curves, gradients, joints, reinforcement, car track paving, alleys, curbs, crown, drainage, resurfacing, cement bound macadam, concrete bases, colored concrete for pavements and walks, traffic lines of concrete, and sidewalks; and construction of concrete pavements including materials, aggregate storage, concrete for pavements, subgrade, mixing concrete, placing concrete, placing reinforcement, part width at a time, joints, finishing, cracking during construction, curb or curb and gutter, curing, test of concrete, and maintenance.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 4Yd; 1939. Construction of Portland Cement Concrete Pavements.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10, 516.0; sand, gravel, broken stone, slag, *see* 512.1, 512.2; concrete, *see* 516.3; grading for roadway, *see* 518.1; foundations for roads, *see* 518.2; concrete sidewalks, *see* 518.5; curbs and gutters, *see* 518.63, 518.84; general road design, *see* 518.30; road building equipment, weighing equipment, *see* 743, 793.5.

518.32 Gravel Pavements

American Society for Testing Materials, D 694-44; 1944. Crushed Stone, Crushed Slag, and Gravel for Water-Bound Base and Surface Courses of Pavements. Cover general characteristics, physical requirements, sizes, sieve analysis, and methods of sampling and testing, using A.S.T.M. methods.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Crushed Gravel or Crushed Stone Surface Course.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Gravel Surface Course.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10; gravel, sand, *see* 512.11, 512.12; grading for roadways, *see* 518.1; foundations of roads, *see* 518.2; curbs and gutters, *see* 518.63, 518.84; road building equipment, *see* 743.

518.33 Macadam Pavements

American Public Works Assn. Specification for Modified Tar Macadam Pavement, G8-36; 1936. Consists of broken stone or slag bound with cold tar and stone or slag particles introduced from the surface and laid on suitable foundation. Describes aggregates, tar cement, construction, and tests using A.S.T.M. methods.

American Public Works Assn. Specification for Tar Macadam Pavement, G9-36; 1936. For wearing course consisting of crushed stone or slag consolidated by rolling and subsequently filled with hot tar and finer crushed stone or slag. Requirements for aggregates, hot tar, construction, and tests using A.S.T.M. methods for materials.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Macadam Pavements; and Cement Grouted Macadam Platforms, Floors, Pavements, and Pavement Bases. Gives requirements for grade, subgrade, curb, gutter, material, construction and guarantee.

Portland Cement Assn. Cement Bound Macadam Pavement; 1934. General requirements for coarse aggregate pavement bound together with Portland cement grout; materials in accordance with A.S.T.M. specifications.

for construction of subgrade, forms, joints, compation prior to grouting, composition of grout, machine and hand finishing methods, and curing.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes: Class B-1, dense graded road-mix surface course; class B-2, dense graded plant-mix surface course; class C-1, dense graded road-mix surface course; class C-2, open graded road-mix surface course; class D-1, mosaic macadam pavement; class D-2, three-application pavement; class E-1, plant-mixed seal coat macadam; class E-2, four-application macadam; class F-1, dense graded plant-mixed surface course; and class F-2, open graded plant-mixed surface course.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10; sand, gravel, broken stone, slag, *see* 512.1, 512.2; bituminous macadam pavements, *see* 518.34, 518.37; grading for roadway, *see* 518.1; foundations and base courses, *see* 518.2; curbs and gutters, *see* 518.63, 518.64; general road design, *see* 518.30; road building equipment, *see* 743.

518.34 Bituminous Macadam and Bituminous Concrete Pavements

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for bituminous carpets—requirements for materials (tar, asphalt, aggregates), preparation of subfloor, construction of tar mat surface, construction of asphalt mat surface (mixed and penetration methods), opening to traffic, and measurement and payment.

American Public Works Assn. Specification for Sheet Asphalt Pavement, G1-36; 1936. Gives general description for construction of binder course and wearing surface, requirements for materials including sources, aggregates, paving plant, composition of binder mixture, and surface mixture, construction, maintenance, and tests.

American Public Works Assn. Specification for Stone Filled Sheet Asphalt Pavement, G2-36; 1936. For materials and methods of construction including requirements for sources of supply, aggregates, fillers, asphalt cement, paving plant, testing equipment, composition of asphaltic concrete mixture, placing, compacting, and for tests of materials by A.S.T.M. methods.

American Public Works Assn. Specification for Asphalt Macadam Pavement, G3-36; 1936. Consists of coarse broken stone or slag consolidated by rolling, enterstices filled with hot asphalt and fine stone or slag. Requirements for thickness, sub-base, seal coat, aggregates, asphalt cement, construction, and tests of materials following A.S.T.M. methods.

American Public Works Assn. Specification for Fine Aggregate Asphaltic Concrete Pavement, G4-36; 1936. Covers mixture of broken stone, or stone and sand, mineral filler and asphalt laid on sub-base and finished with seal coat of hot asphalt and stone chips or sand. Requirements for thickness, aggregates, asphalt, construction, and tests using A.S.T.M. methods.

American Public Works Assn. Specification for Coarse Aggregate Asphaltic Concrete Pavement, G5-36; 1936. Consists of mixture of broken stone, or stone and sand, mineral filler and asphalt laid on sub-base and sealed with hot asphalt and stone chips or sand. Materials, paving plant, construction, and tests of materials by A.S.T.M. methods.

American Public Works Assn. Specification for Modified Asphalt Macadam Pavement, G7-36; 1936. Gives requirements for materials and method of construction, including aggregates, cut-back asphalt, seal coat, compacting, and finishing, using A.S.T.M. tests.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Construction of Bituminous Crossings. Covers the use of emulsified asphalt, rock asphalt, and cut-back products. Gives requirements for foundation, handling materials, and method of constructing pavement.

American Society for Testing Materials, D 692-42T; 1942. Tentative Specifications for Crushed Stone, Crushed Slag, and Gravel for Bituminous Concrete Base and Surface Courses of Pavements. Includes requirements for sieve analysis and for tests using A.S.T.M. methods.

American Society for Testing Materials, D 693-44; 1944. Crushed Stone and Crushed Slag for Bituminous Macadam Base and Surface Courses of Pavements. Cover the quality and grading of crushed stone to be used in the construction of bituminous macadam base and surface courses. General characteristics, physical properties, sizes, sieve analysis, and methods of sampling and testing.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bituminous Preservative Treatment.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bituminous Prime Coat.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bituminous Sidewalk.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bituminous Tack Coat.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Class A. Seal Coats.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Class A Surface Treatments.

References.—Other bituminous (asphalt) pavement, *see* 518.37; definitions, methods of sampling and of testing for bituminous materials, *see* 502.2, 505.0, 505.30; definitions, methods of sampling and of testing for nonbituminous materials, *see* 500, 510, 512.10; sand, gravel, broken stone, slag, *see* 512.1, 512.2; asphalts, road oils, tar, *see* 505.1, 505.2, 505.3; grading for roadways, *see* 518.1; foundations and base courses, *see* 518.2; curbs and gutters, *see* 518.63, 518.64; mineral filler, *see* 512.16; general road design, *see* 518.30; road building equipment, *see* 743.

518.35 Brick Pavements

American Public Works Assn. Specification for Vitrified Brick Pavement, D1-36; 1936. Requirements as to quality of paving brick, cement, aggregates, asphalt filler, mastic bed, foundation, headers, untreated bed, cement-sand bed, brick laying, rolling, expansion joints, bituminous filler, cement grout filler, maintenance, brick gutters, and parking strips, etc. Materials to be tested in accordance with A. S. T. M. methods. Adopted by National Paving Brick Assn.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Brick Pavements and Floors. Gives requirements for grading, subgrade, foundation, curb, gutters, materials, expansion joints, laying, tamping, rolling, applying fillers, and guarantee.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Brick Sidewalk.

References.—Definitions, methods of sampling and of testing, *see* 500, 512.10, 534.10; sand-lime brick, *see* 513; clay brick, *see* 534.11; cushioning materials, *see* 512.12, 512.2, 518.20; sand filler, mineral fillers, *see* 512.12, 512.16; cement grout filler, *see* 516.9; bituminous filler, *see* 505.15; grading for roadway, *see* 518.1; foundations for roads, *see* 518.2; curbs and gutters, *see* 518.63, 518.64; general road design, *see* 518.30; road building equipment, *see* 743.

518.36 Stone Block Pavements

American Public Works Assn. Specification for Stone Block Pavement, E1-36; 1936. For stone block on sand cushion or cement-sand bed paved on concrete base course; requirements for new granite blocks as to quality, size and dressing, resurfacing blocks, new sandstone blocks, durax paving blocks, cement grout and bituminous mastic fillers, construction, and protection of finished surface.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10; stone block, *see* 511.71; mineral filler, grout filler, *see* 512.16, 516.9; bituminous fillers, *see* 505.15; cushioning materials, *see* 512.12, 512.2, 518.20; preparation of roadway, *see* 518.1; foundations for roads, *see* 518.2; curbs and gutters, *see* 518.63, 518.64; general road design, *see* 518.30; road building equipment, *see* 743.

518.37 Asphalt Pavements

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for asphalt block wearing surfaces—requirements for asphalt block (composition, physical characteristics, manufacture), preparation of sub-floor, mortar bed, laying the blocks, opening to traffic, and measurement and payment.

American Public Works Assn. Specification for Cold Laid Asphaltic Concrete Pavement (Plant Mix Liquefier Type), TG8-36; 1936 (Tentative). Consists of two courses of cold laid asphaltic concrete and top dressing on prepared sub-base. Requirements for materials, including aggregate, hydrated lime, asphalt cement, and naphtha liquefier for warm and for cold weather, composition of mixtures, paving plant, and construction, using A. S. T. M. methods of tests for materials.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Sheet Asphalt Pavements; Asphalt Block Pavements; and Asphalt Macadam Pavements. Gives requirements for grading, subgrade, foundations, curbs, gutters, materials, filler, asphaltic cement, construction, and guarantee.

Asphalt Institute. Construction Specifications A-1; 1942. Asphalt Macadam Surface Course (Penetration Method With Hot Asphalt Cement). Includes general description, mineral aggregate, asphalt cement, approval of materials, methods of testing, spreading and compacting coarse aggregate, first application of asphalt cement, filling surface voids with fine aggregate, seal coat, back rolling, protection of pavement, and measurement and payment.

Asphalt Institute. Construction Specifications A-2; 1942. Asphaltic Concrete Surface Course (Coarse Graded Aggregate Type). Includes general description, coarse aggregate, fine aggregate, mineral filler, asphalt cement, approval of materials, methods of testing, paving plant essentials, preparation of asphalt cement, preparation of mineral aggregate, preparation and composition of mixture, paving plant inspection, transportation of mixture, general conditions, placing asphalt mixture, joints, compaction of mixture, and measurement and payment.

Asphalt Institute. Construction Specifications A-3; 1942. Stone Filled Sheet Asphalt Surface Course. Includes general description, stone or slag, sand, mineral filler, asphalt cement, approval of materials, methods of testing, paving plant essentials, preparation of asphalt cement, preparation of mineral aggregate, preparation and composition of mixture, paving plant inspection, transportation of mixture, general conditions, placing asphalt mixture, joints, compaction of mixture, surface finish, and measurement and payment.

Asphalt Institute. Construction Specifications A-4; 1942. Sheet Asphalt Binder and Surface Courses. Includes general description, coarse aggregate, sand for binder course, sand for surface course, mineral filler, asphalt cement, approval of materials, methods of testing, paving plant essentials, preparation of asphalt cement, preparation of mineral aggregates, preparation and composition of binder course mixture, preparation and composition of surface course mixture, paving plant inspection, transportation of mixtures, general conditions, placing asphalt mixtures, joints, compaction of mixtures, coarse surface finish for sheet asphalt mixture, and measurement and payment.

Asphalt Institute. Construction Specifications A-5; 1942. Sand-Asphalt Base Surface Courses (Hot-Mix Type). Includes general description, sand, mineral filler, asphalt cement, approval of materials, methods of testing, paving plant essentials, preparation of asphalt cement, preparation of sand, preparation and composition of mixture, paving plant inspection, transportation of mixtures, general conditions, placing asphalt mixtures, joints, compaction of mixtures, and measurement and payment.

Asphalt Institute. Construction Specifications B-6; 1942. Patching, Reducing Crown and Correcting Profile (of Old Surfaces Which Are To Serve as

Foundations). Includes general description, materials, reduction of grade, removal of loose and foreign material, removal of bumps and waves, priming waterbound surfaces, patching, special patching mixture, leveling course, approval of materials, and methods of testing.

Asphalt Institute. Construction Specifications B-7; 1942. Asphalt Macadam Base (Penetration Method With Hot Asphalt Cement). Includes general description, mineral aggregate, asphalt cement, approval of materials, methods of testing, spreading and compacting coarse aggregate, first application of asphalt cement, filling surface voids with fine aggregate, second application of asphalt cement, back rolling, protection of base, and measurement and payment.

Asphalt Institute. Construction Specifications B-8; 1942. Asphaltic Concrete Base (Coarse Graded Aggregate Type). Includes general description, coarse aggregate, fine aggregate, asphalt cement, approval of materials, methods of testing, paving plant essentials, preparation of asphalt cement, preparation of mineral aggregate, preparation and composition of mixture, paving plant inspection, transportation of mixture, general conditions, placing asphalt mixture, joints, compaction of mixture, and measurement and payment.

Asphalt Institute. Construction Specifications S-1; 1942. Asphalt Surface Treatment or Retreatment of Old Bituminous Surfaces. Includes general description, mineral aggregate, cut-back asphalt, approval of materials, methods of testing, preparation of existing road surface, application of cut-back asphalt, application of mineral aggregate, and measurement and payment.

Asphalt Institute. Construction Specifications S-2; 1942. Asphalt Surface Treatment of Water Bound or Traffic Bound Surfaces. Includes general description, mineral aggregate, asphaltic materials, approval of materials, methods of testing, preparation of existing road surface, application of asphalt primer, application of asphalt binder, application of mineral aggregate, and measurement and payment.

Asphalt Institute. Construction Specifications S-3; 1942. Asphalt Surface Treatment of Loosely Bonded Surfaces. Includes general description, mineral aggregate, asphaltic material, approval of materials, methods of testing, preparation of existing road surface, pressure distributor, first application of asphaltic material, application of mineral aggregate cover, second application of asphaltic material, blading and compaction, and measurement and payment.

Asphalt Institute. Construction Specifications S-4; 1942. Emulsified Asphalt Surface Treatment of Old Bituminous or Other Paved Surfaces (Particularly Adapted to Smooth Texture Surfaces). Includes general description, mineral aggregate, emulsified asphalt, approval of materials, methods of testing, preparation of existing road surface, application of materials, rolling and brooming, and measurement and payment.

Asphalt Institute. Construction Specifications S-5; 1942. Emulsified Asphalt Single and Double Surface Treatments of Waterbound and Rough Texture Surfaces. Includes general description, mineral aggregate, emulsified asphalt, approval of materials, methods of testing, preparation of old surface, application of emulsified asphalt, first application of mineral aggregate for double surface treatment, seal coat application, protection of pavement, preparation and priming of base, and measurement and payment.

Asphalt Institute. Construction Specifications CL-1; 1942. Cold-Laid Asphaltic Plant-Mix Surface Course (Primed Macadam Aggregate Type). Includes general description, mineral aggregate, hydrated lime, asphaltic materials, approval of materials, methods of testing, paving plant essentials, preparation of asphalt cement, preparation of mineral aggregate, preparation and composition of mixtures, paving plant inspection, preparation of base, transportation of mixtures, general conditions, placing coarse and medium mixtures, joints, compaction of mixtures, application of top dressing, and measurement and payment.

Asphalt Institute. Construction Specifications CL-2; 1942. Cold-Laid Asphaltic Plant-Mix Surface Course (Macadam Aggregate Type). Includes general description, mineral aggregate, asphaltic materials, approval of materials, methods of testing, paving plant essentials, preparation of cut-back asphalt, preparation of mineral aggregate, preparation and composition of mixture, paving plant inspection, preparation of base, transportation of mixture, general conditions, placing asphalt mixture, joints, compaction of mixture, application of seal coat, and measurement and payment.

Asphalt Institute. Construction Specifications CL-3; 1942. Cold-Laid Asphaltic Plant-Mix Surface Course (Dense Graded Aggregate Type). Includes general description, mineral aggregate, asphaltic materials, approval of materials, methods of testing, paving plant essentials, preparation of cut-back asphalt, preparation of mineral aggregate, preparation and composition of mixture, paving plant inspection, preparation of base, transportation of mixture, general conditions, spreading and compacting the mixture, application of seal coat, and measurement and payment.

Asphalt Institute. Construction Specifications CL-4; 1942. Cold-Mix—Cold-Laid Emulsified Asphalt Plant-Mix Base and Surface Courses (Dense Graded Aggregate Type). Includes general description, mineral aggregate, emulsified asphalt, approval of materials, methods of testing, computation of quantity of emulsion, preparation of mixtures, paving plant inspection, preparation of base, transportation of mixtures, general conditions, spreading mixtures, rolling, and measurement and payment.

Asphalt Institute. Construction Specifications CP-1; 1942. Stock-Pile Asphalt Paving Mixtures for Making Quick Repairs of Bombed Surfaces. Includes general description, mineral aggregate, asphaltic materials, approval of materials, methods of testing, paving plant, preparation and composition of mixture (alternate 1, 2, and 3), stock piling, and measurement and payment.

Asphalt Institute. Construction Specifications MP-1; 1942. Modified Penetration Emulsified Asphalt Surface Course. Includes general description, mineral aggregate, asphalt, approval of materials, methods of testing, preparation of base, application of coarse aggregate, first penetration application of emulsified asphalt, filling surface voids with intermediate aggregate, second application of emulsified asphalt, seal coat, protection of pavement, and measurement and payment.

Asphalt Institute. Construction Specifications MP-2; 1942. Modified Penetration Cut-Back Asphalt Surface Course. Includes general description, mineral aggregate, asphaltic materials, approval of materials, methods of testing, preparation of base, application of coarse aggregate, first application of asphalt binder, filling surface voids with fine aggregate, seal coat, protection of pavement, and measurement and payment.

Asphalt Institute. Construction Specifications RM-1; 1942. Asphaltic Road-Mix Surface Course (Macadam Aggregate Type). Includes general description, mineral aggregate, asphaltic materials, approval of materials, methods of testing, preparation of existing base, application of asphalt primer, spreading coarse aggregate, first application of asphaltic binder, mixing operation, compaction, application of seal coat, and measurement and payment.

Asphalt Institute. Construction Specifications RM-2; 1942. Asphaltic Road Mix Surface Course (Dense Graded Aggregate Type). Includes general description, mineral aggregate, asphaltic materials, approval of materials, methods of testing, preparation of existing base, application of asphalt primer, preparation of mineral aggregate for treatment, application of asphaltic binder, mixing operation, spreading and compacting the mixture, application of seal coat, and measurement and payment.

Asphalt Institute. Construction Specifications RM-3: 1942. Sand-Asphalt Road Mix Course on Natural Sand Subgrade. Includes general description, sand, mineral filler, asphaltic materials, approval of materials, methods of testing, mixing equipment, pressure distributor, rollers, preparation of mineral aggregate for treatment, application of asphaltic binder, mixing operation, compaction, application of seal coat, and measurement and payment.

U. S. Gov., Federal Specification SS-A-706b; 1943. Asphalt (for Use in) Road and Pavement Construction. Shall be asphalts prepared by the distillation of asphaltic petroleum or by the fluxing of hard native Trinidad asphalt with a suitable petroleum flux. Covers nine types of petroleum asphalt and nine types of fluxed Trinidad asphalt. Gives details for each type including specific gravity, flash point, softening point, penetration at 25°C., ductility at 25°C., loss at 163°C., bitumen (soluble in carbon disulphide), and uniformity; methods of sampling and testing; and packing and marking for shipment.

References.—Other asphaltic (bituminous) pavements, *see* 518.34; definitions, methods of sampling and of testing asphaltic materials, *see* 502.2, 505.0; definitions, methods of sampling and of testing nonbituminous materials, *see* 500, 510, 512.10; sand, gravel, broken stone, slag, *see* 512.1, 512.2; asphalts, road oils, *see* 505.1, 505.2; mineral filler, *see* 512.16; grading for roadway, *see* 518.1; foundations and base courses, *see* 518.2; curbs and gutters, *see* 518.63, 518.64; road design, *see* 518.30; road building equipment, *see* 743.

518.38 Sand Clay or Top-Soil Pavements

Portland Cement Assn. Soil-Cement Airport Runways and Landing Areas, SC-101; 1939. Specifications for a combination of soil and Portland cement, moistened, compacted, and shaped to conform to grades; requirements for preparation of soil, materials in accordance with A.S.T.M. specifications; mixing of cement with cultivators, gang plows, or disc harrows; and protection of finished surface.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Selected Borrow Surface Course.

References.—Definitions, methods of sampling and of testing, *see* 500, 510, 512.10; sand, *see* 512.11; grading for roadways, *see* 518.1; foundations for roads, *see* 518.2; grading of soils, *see* 594; road building equipment, *see* 743.

518.39 Miscellaneous Pavements Specifications

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Construction of Rail Type Street Crossings. Cover second-hand or scrap steel rails of lighter weight section than the running rails. Gives requirements for materials and installation.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Construction of Wood Plank Street Crossings. Gives requirements for materials and construction.

American Society for Testing Materials, D 806-44 T; 1944. Tentative Method of Test for Cement Content of Soil-Cement Mixtures. Covers scope, apparatus, reagent, samples, procedure, and calculations.

Portland Cement Assn. Soil-Cement Mixtures, Laboratory Handbook, 1942. For using common soils and Portland cement to produce a usable construction material for light-traffic roads, runways, and parking areas. Covers soil identification and classification, soil surveys and soil sampling, A.S.T.M. soil-cement tests, supplementary soil-cement tests, procedures for setting up cement contents to be investigated in soil-cement tests, analysis of soil and soil-cement test data, cement-modified soil, research on soil-cement, appendix, tables, and charts.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-95. Driveway.

References.—Wood block and wood block pavements, *see* 402.3.

518.4 BRIDGE CONSTRUCTION

518.41 Bridges

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes general provisions—definition of terms, proposal requirements and conditions, award and execution of contract, scope of work, control of work and materials, legal relations and responsibility to public, prosecution and progress, and measurement and payment; specifications for construction—excavation and fill, sheet piles, bearing piles, concrete masonry, reinforcement, ashlar masonry, mortar rubble masonry, dry rubble masonry, brick masonry, steel structures, bronze or copper-alloy bearing and expansion plates, steel grid flooring, railings, painting metal structures, riprap, concrete cribbing, waterproofing, dampproofing, name plates, timber structure, preservative treatments for timber, timber cribbing, sectional plate pipe and arches, and wearing surfaces; recommendations for design—general features of design, loads, distribution of loads, unit stresses, pile loads, and bearing power of soils, substructure and retaining walls, structural steel design, concrete design, design of timber structures, sectional plate pipe and arches, and rating of existing bridges; specifications and references to other specifications for cement, water for use with cement, aggregates, reinforcement, structural, eyebar and rivet steels, wrought iron, steel forgings and castings, gray-iron and malleable castings, bronze or copper-alloy bearing and expansion plates, sheet piles, steel sheet piling, steel grid floors, paint, welding, sheet metal for water stops and general use, sectional plate pipe and arches, stone for masonry, brick, bituminous materials and joint fillers, asphalt paving blocks, premolded asphalt plank, structural timber, lumber and piling, and timber preservatives; tables of moments, shears, and reactions; formulas for compressive members; and truck train and equipment loadings.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Concrete and Reinforced Concrete Railroad Bridges and Other Structures. Gives requirements for materials; proportioning and mixing; depositing in air, under water, in sea water, and in alkali soils or water; curing; forms; metal reinforcement; protective covering; joints; waterproofing; and surface finish. Emergency Provisions, adopted Feb. 3, 1943, provides for maximum reuse of material for forms and conserving metal by using outside bracing for metal ties and bituminous mastic for water tight joints in lieu of metal dams.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Rigid Frame Concrete Bridges. Gives requirements for design, formulas for analysis, and details of design of various items involved.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Concrete and Stone Masonry Bridges.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Culverts and Retaining Walls.

References.—Stone, *see* 511; sand, gravel, broken stone, slag, *see* 512; cement, *see* 516.1; concrete and mortars, *see* 516.3; cast stone, concrete cribbing, concrete blocks, *see* 516.4; steel reinforcement, *see* 805.25; wooden bridges, *see* 412.2; steel bridges, *see* 805.21; asphalts, *see* 505.1; tar and pitch, *see* 505.3; riprap, *see* 511.72; rubble and ashlar masonry, *see* 518.81, 518.82; brick masonry, *see* 518.83; masonry arches, *see* 518.48, 518.84.

518.42 Piling

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for bearing piles—materials, limitation of use, preparation for driving (excavation, caps, collars, pointing, splicing, and painting steel piles), methods of driving (general, hammer for timber and steel piles, hammer for concrete piles, additional equipment, leads, followers, and water jets), defective piles, determination of bearing piles (loading tests, timber piles, and concrete and steel piles), test piles, order lists for piling, storage and handling of timber piles, cutting off timber piles, cutting off steel or steel shell piles, capping timber piles, manufacture of precast concrete piles (general, concrete, form work, reinforcement, casting, finish, and curing), storage and handling of precast concrete piles, manufacture of cast-in-place concrete piles (general, inspection of metal shells, class of concrete, reinforcement, and placing concrete), extensions or "Build-Ups," painting steel piles and steel pile shells, measurement and payment (two methods), payment for test piles, and payment for loading piles.

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for sheet piles to be left in place so that it becomes a part of the finished structure—timber sheet piles, concrete sheet piles, steel sheet piles, and measurement and payment.

American Public Works Assn. Sewers, J1-38; 1938. Includes specifications for piling, including wood, concrete and reinforced concrete; requirements for structural timber and piling to meet specifications of the American Association of State Highway Officials for highway bridges and incidental structures, grading of timber in accordance with provisions of American Lumber Standards, limitations for uses of species, timber sheet piles, concrete piles, plain and reinforced built-in-place piles, driving of piles and pile driving equipment, methods of determination of load bearing values, storage and handling of wood piles, length and diameters of piles, etc.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Making and for Driving Precast Concrete Piles. Gives requirements for materials; class; workability, placement, and curing of concrete; handling; driving equipment; jetting; load capacity; replacing and redriving; and cut-off.

Portland Cement Assn. Concrete Piles, 1939. Includes precast and poured-in-place foundation piles, classification of soil structure, pile driving formulas, load capacities of single and group piling; design, manufacture, and driving of precast piles; shell, shell-less and pipe formed poured concrete piles; sheet piles, and bulkheads, materials meeting A.S.T.M. specifications, mixing and placing concrete, forms, and curing.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Piling.

References.—Sand, gravel, broken stone, *see* 512.1; cement, *see* 516.1; concrete and mortars, *see* 516.3; steel reinforcement, *see* 605.25; wooden piling, *see* 401.4.

518.43 Parapets and Railings

References.—Sand, gravel, broken stone, *see* 512.1; cement, *see* 516.1; concrete and mortars, *see* 518.3;

steel reinforcement, *see* 605.25; cast iron pipe for railings, *see* 607.13; other iron and steel pipe, *see* 607.2, 607.3, 607.4; masonry bridges, *see* 518.41; wooden railing lumber, *see* 402.2.

518.44 Bridge Slabs and Girders

References.—Sand, gravel, broken stone, *see* 512.1; cement, *see* 516.1; concrete and mortars, *see* 516.3; steel reinforcement, *see* 605.25; masonry bridges, *see* 518.41.

518.45 Concrete Floors for Bridges

References.—Sand, gravel, broken stone, slag, *see* 512; cement, concrete, *see* 516.1, 516.3; steel reinforcement, *see* 605.25; brick, *see* 534.11; paving surfaces, *see* 518.3.

518.46 Bridge Arches

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for sectional plate pipe and arches—requirements for materials (conforms to A. A. S. H. O. Specification M-36); description, forming, and punching of plates; field erection (pipe structures, arches); strutting; arch substructures and headwalls; workmanship; method of measurement; and basis of payment.

References.—Sand, gravel, broken stone, slag, *see* 512; cement and concrete, *see* 516.1, 516.3; steel reinforcement, *see* 605.25; other masonry arches, *see* 518.84; rubble and ashlar masonry, *see* 518.81, 518.82.

518.5 BUILDING CONSTRUCTION AND MATERIAL

References.—Steel buildings and metal parts of buildings, *see* 605.22.

518.50 General Items

American Institute of Architects, Document 172; 1942. For filing information on building materials, appliances, and equipment. To simplify the filing problem of architects, engineers, landscape architects, contractors, and others desirous of selecting and filing for convenient reference not only the catalogs and other descriptive literature distributed by manufacturers and producers of building materials, appliances, and equipment, but other informative material referring to building and construction and related activities. Classifications and file numbers are arranged under 41 major divisions. Provides a filing system with the necessary flexibility and comprehensive alphabetical index.

American Institute of Architects, Document 239. Cubic Contents of Buildings —A Standard Method of Calculation and Form of Statement. Gives definition of "standard cubic contents," interpretation, supplementary information, explanation, and examples.

American Municipal Assn. and Building Officials' Conference of America, Inc., sponsors. American Standards Assn., A55.1; 1944. Administrative Requirements for Building Codes. Covers title and scope, organization, powers and duties of building official, application for permit, permits, fees, inspection, certificate of occupancy, posting floor loads, board of appeal, appeals, decisions of the board of appeal, violations, invalidity, enforcement jurisdiction, and appendices covering permit fees and enforcement.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes. Gives list of unit weights of materials of construction.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railway Purposes, 1939. Incorporates the American Railway Engineering Assn. Construction Contract Form. Gives general conditions; requirements for excavation, filling and back-filling, sewers and drainage, concrete, brickwork, stone masonry and cut stone work, clay hollow tile, architectural terra cotta, concrete architectural stone, concrete roofing tile, clay roofing tile, slate roofing, built-up roofing, sheet metal work, structural steel and iron, ornamental and miscellaneous metal work, carpentry and millwork, lathing and plastering, marble and tile work, painting and glazing, hardware, plumbing, heating, oil burning equipment, electric light wiring, brick pavements and floors, concrete pavements and foundations, creosoted wood block pavements, wood block floors, sheet asphalt pavements, asphalt mastic floors, asphalt block pavements and floors, macadam pavements, asphalt macadam pavements, sprinkler system, elevators, chimneys, and screens.

American Society for Testing Materials, C 19-41; 1941. Joint sponsor with the National Bureau of Standards and A. S. A. Fire Protection Group. American Standards Assn., A2.1-1942. Methods of Fire Tests of Building Construction and Materials. Applicable to assemblies of masonry units and to composite assemblies of structural materials for buildings, including bearing and other walls and partitions, columns, girders, beams, slabs, and composite slab and beam assemblies for floors and roofs, also applicable to other assemblies and structural units that constitute permanent integral parts of a finished building, but not having determined suitability for use after fire exposure. Standard time-temperature curve for control of fire tests, classification as determined by test, fire endurance and hose stream tests, size of sample and condition for acceptance.

American Society for Testing Materials, C 152-41; 1941. Joint sponsor with National Bureau of Standards and A. S. A. Fire Protection Group. American Standards Assn., A2.2-1942. Methods of Fire Tests of Door Assemblies. Covers various types and materials used as protectives against passage of fire, heat, fumes, or smoke; performance during exposure but not for ratings or standards for different uses. Control of fire tests, furnace temperatures, temperature of unexposed surfaces, test structures, test assemblies, fire and hose tests, heat insulation, and fire resistance.

American Society for Testing Materials, C 168-44; 1944. Definitions of Terms Relating to Thermal Insulating Materials. Defines preformed thermal insulating block and thermal insulating cement.

American Society for Testing Materials, C 177-42 T; 1942. Tentative Method of Test for Thermal Conductivity of Materials by Means of the Guarded Hot Plate. Tests obtained on dry specimens only.

American Standards Assn., A10.2-1944. Sponsored by American Institute of Architects and Nat'l Safety Council. Safety Code for Building Construction. Covers demolition, excavation work, welding and cutting, piling, handling and storing materials, blasting; compressed-air work, derricks, scaffolds, ladders, hoists and elevators, temporary floors, stairs, railings and toe boards, and housekeeping, temporary wiring and lighting, temporary sanitation, and salamanders.

American Wood-Preservers' Assn., 50d; 1944. Recommended Practice for the Use of Pressure Treated Lumber in Protecting Buildings Against Decay and Termites. For protection against decay and against subterranean termites and dry-wood termites. Designates construction in contact with the ground and construction not in contact with the ground. Gives minimum retention (lb.-cu. ft.) required for various kinds of preservatives.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 7.13; 1940. Anchorage for Factory Roofs—Principles and Design Data. Includes basis of design, wind forces, suggested steps for designing roof anchorage, workmanship, foundations, calculations, suggested methods of roof anchorage, and tables of data used in designing roof anchorage.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 21.71; 1938. Winter Protection for Dry-Pipe Valves. Includes recommendations for insulated wood-frame frost enclosures.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 22.70; 1940. Detailed Specifications for Laying Fire Mains. Includes requirements for cast iron pipe, asbestos-cement pipe, pipe linings, fittings, suction pipe, protection, excavation and preparation, foundations, pipe laying, blocking, and jointing, valves, indicator posts and cast iron fittings, plugging dead ends, anchorage of tees, plugs, and bends, hydrostatic test, backfilling, and special type pipe. Factory Mutual Bulletin of Loss Prevention 22.71; 1940. Anchoring Fire Mains. Gives diagrams of various methods of anchoring conditions.

Associated Factory Mutual Fire Insurance Companies. Panphlet 80; 1934. Construction, Fire Resistance of Industrial Buildings. Covers main points in brief and gives types of construction, subdivision by fire stops, protection of floor openings, prevention of water damage, hazardous occupancies, warehouses and storehouses, protection against exposure fires, construction fire hazards, planning fire protection, heavy timber construction, planning construction for effective and economical sprinkler protection, protecting steelwork, noncombustible and fire-resistive roofs, construction of fire cut-offs, waterproofing floors, auxiliary and temporary buildings, miscellaneous details, wind resistance, and earthquake resistance.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Code of Standard Practice—Concrete Joist Construction Floor Forms. The practice and customs contained in this code are in accordance with good engineering practice, tend to insure safety and economy for concrete joist construction floors, and are standard within the Industry. Covers engineering service, estimating, materials, execution, arbitration, and contracts.

National Assn. of Building Owners and Managers. Sheridan-Kackow Formula for Determining Rental Value of Office Space. Revised, 1941. Includes explanatory data, key to computations, definitions, rental schedule foundation, adjustments required for group comparisons, formula to reflect the relative value of various kinds of space within any given building in relation to the base rate of that building, definition of base rate, and explanatory footnotes on formula.

National Board of Fire Underwriters. Building Codes, Their Scope and Aims, 1940. Covers early codes, art of building, masonry walls as fire stops, windows need protection, height a factor in fires, large areas make large fires, reducing fire areas in buildings, life safety a vital factor, enclosure of stairways and elevator shafts, fireproof construction, equipment to extinguish fires, and enforcement a vital need.

National Board of Fire Underwriters. Recommended Building Code, 1943. Covers administration, definitions, classification, general building restrictions, light and ventilation, means of egress, materials, loads and stresses, construction, safeguards during construction, fire resisting features of construction, chimneys, flues and vents, heat appliances, heating, ventilating, air conditioning, blower and exhaust systems, places of assembly, theatres, motion picture theatres, assembly halls and garages, elevators, escalators, dumbwaiters, and amusement devices; miscellaneous equipment, electrical installations, fire extinguishing equipment, signs and outdoor display structures, and appendices.

National Board of Fire Underwriters. Hose Houses for Mill Yards, No. 25; 1940. Standards for the construction and equipment. Gives sizes, materials, illustrated designs for frame hose housing, hose shelving, hardware, fire equipment, length and size of hose provided.

National Board of Fire Underwriters. Nitrocellulose Motion Picture Film, No. 40; 1939. Storage and handling requirements for construction and arrangement of buildings, electrical equipment, heating, sprinklers, allowable weight of film in cabinets and vaults, construction of film cabinets and film vaults, containers and transportation of film, motion picture projectors, motion picture theaters, film exchanges, laboratories, studios, etc.

National Board of Fire Underwriters. Photographic and X-Ray Nitrocellulose Films, No. 41; 1930. Regulations for the storage and handling in stores, warehouses, commercial studios, hospitals, laboratories, etc., maximum volume of cabinets, vaults, and outside storage houses.

National Board of Fire Underwriters. Pyroxylin Plastic in Factories, No. 42; 1940. Standards for the storage, handling, and use of pyroxylin plastic in factories making articles therefrom. Covers synopsis, application, definitions, general requirements, isolated storage buildings, storage of raw materials, manufacturing, inspection and packing, storage of finished stock, display and sales tables, and factories using finished pyroxylin articles for assembly with other materials.

National Board of Fire Underwriters. Pyroxylin Plastic in Warehouses and Stores, No. 43; 1940. Standards for the storage and handling of pyroxylin plastic in warehouses and wholesale jobbing and retail stores. Covers introduction, scope of standards, sales and handling, storage of loose or packed articles not in shipping containers, storage of finished articles in shipping containers, storage of raw stock in shipping containers, and general requirements.

National Board of Fire Underwriters. Storage and Handling of Combustible Fibres, No.44; 1941. For cotton, sisal or henequen, ixtle, jute, hemp, tow, cocoa fibre, oakum, baled waste, kapok, Spanish moss, and excelsior. Covers fire-resistive fibre warehouses, fire extinguishing equipment, operation and maintenance, nonfire-resistive warehouses, quantities and storage methods, and appendix.

National Board of Fire Underwriters. Protection of Openings in Walls and Partitions Against Fire, No.80; 1939. Regulations for devices including doors, shutters, windows, etc., designed to resist the passage of fire, in six classes. Number of units, stability, insulation, combustibility, safety, installation, and maintenance. Includes sliding, swinging, rolling shutter doors, hollow metal, tin clad, door closers, elevator doors, shutters, wired glass windows, and diagrams of various types of doors, shutters, and windows.

National Fire Protection Assn. American Standards Assn., A 9.1-1942. Building Exit Codes. Covers definitions, stairs and stair enclosures, outside stairs (fire escapes), ramps, horizontal exits, doors, aisles and corridors, elevators, escalators, slide escapes, alarm systems, fire exit drills, and signs and lighting. Gives general requirements and requirements for schools, department stores, factories, hospitals, sanitariums and corrective institutions, places of public assembly, hotels and apartment houses, and office buildings.

National Safety Council (American Society of Safety Engineers, Engineering Section). American Standards Assn., A12-1932. Safety Code for Floor and Wall Openings, Railings, and Toe Boards. Standards of size, strength, and construction of stair railings, handrails, and guards for floor and wall openings and holes and for open-sided floors, platforms, and runways.

National Safety Council (American Society of Safety Engineers, Engineering Section). American Standards Assn., A14-1935. Safety Code for Construction, Care and Use of Ladders. Definition of terms; kind and quality of materials; specifications and construction of fixed, single, extension, fire, step, trolley and side-rolling, sectional, trestle, and extension trestle ladders; installation of fixed ladders; accessories; care and use.

National Safety Council. American Standards Assn., A39-1933. Recommended Practice for Window Cleaning. Applies to all window cleaning operations performed wholly or partially on the outside of all public buildings more than one story high, or in which the sills of windows are located more than ten feet above grade or adjoining roof. Requirements when to use approved safety devices. Requirements on swinging scaffolds, boatswain's chair, sectional ladder, belts, belt terminals, and anchors.

Pacific Coast Building Officials Conference. Uniform Building Code, 1943. The purpose of this code is to provide certain minimum standards, provisions, and requirements for safe and stable design, methods of construction, and uses of materials in building and structures hereafter erected, constructed, enlarged, altered, repaired, moved, converted to other uses or demolished, and to regulate the equipment, maintenance, use, and occupancy of all buildings and structures. Covers twelve parts—(I)administrative, (II)definitions and abbreviations, (III)requirements based on occupancy, (IV)requirements based on location in fire zone, (V)requirements based on types of construction, (VI)engineering regulations, quality, and design of the materials of construction, (VII)detailed regulations, (VIII)fire-resistive standards for fire protection, (IX)regulators for use of public streets and projections over public property, (X)plastering, (XI)special subjects, and (XII)legislative.

Society of Motion Picture Engineers. Projection Room Plans, 1942. Recommendations for use in designing and remodeling projection rooms so that greater uniformity of construction and greater efficiency in projection will exist in the future. Projection room facilities shall consist of the projection room proper, film rewind and storage space, a power equipment room, and a lavatory. Recommendations cover projection room proper, rewind room, power equipment room, lavatory, exits, conduits and circuits, lighting, ventilation, heating, painting and floor covering, equipment, and miscellaneous.

Underwriters' Laboratories, Inc., American Society for Testing Materials, National Bureau of Standards, and American Standards Assn. Fire Protection Group, joint sponsors. American Standards Assn., A2.1; 1942. Standard Specifications for Fire Tests of Building Construction and Materials, 1942. Gives specification for control of fire tests, classification as determined by test, test structures, test samples, and conduct of fire tests; tests of walls, partitions, columns, floors, and roofs; and tests of protection for combustible framing, or for combustible facings on the unexposed side of walls, partitions, and floors.

Underwriters' Laboratories, Inc. Fire Hazard Classification of Building Materials, 1944. Covers introduction, object of investigation, development program, description of test equipment, test method, interpretation of test results, observations during development tests, classification of untreated lumber, classification of treated lumber, classification of cellulose board, plywoods, felts, and fabrics, and summary.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H19; 1934. Manual of Fire-Loss Prevention of the Federal Fire Council. It is aimed to present herein the essentials relating to design, materials of construction, and equipment and operation of buildings, that effectively prevent or abate loss by fire. An initial discussion is given of justifiable outlay for fire-loss prevention, considering the values and the degree of hazard present. Sections III to VI, inclusive, deal with the fire resistance of building materials, assemblies, and types; control of spread of fire by structural means; and design and arrangement of buildings to secure exit facilities for occupants in case of fire. In sections VII and VIII, structural and equipment features having a bearing on safeguarding hazards incidental to heating, lighting, and power supply are discussed, as also those pertaining to lightning protection, fire hazards during construction, and special occupancy hazards. In Section IX protection of records is treated from the standpoint of construction and equipment, and in section XIII from the standpoint of business routine and general fire prevention. Sections X and XI deal with equipment for detecting and extinguishing fire. In section XII general methods for decreasing the ease of origin and initial spread of fire are outlined; and in sections XIV to XVI, inclusive, the effective use of equipment in case of fire by prior training for emergency, and the systematic inspection of property to enable unnecessary fire hazards to be promptly eliminated and defects in construction and equipment remedied. Two general subdivisions of the manual may be noted, namely, construction and equipment up to and including section XI, and fire prevention and maintenance covered in the subsequent sections.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M151; 1935. Design and Construction of Building Exits. Contains results of surveys of current practice in providing exits and of the rates of speed at which people can effect their escape through different kinds of exits. Presents also the methods employed in the surveys and the results obtained; also suggested requirements are presented to be used when local requirements are under consideration.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 87-32; 1932. Forms for Concrete Joist Construction Floors. This recommendation covers forms for concrete joist construction floors. Gives tables showing standard forms, specials for filler forms, and standard end taper forms.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, BH7; 1924. Minimum Live Loads Allowable for Use in Design of Buildings. Recommended by building code committee for adoption in state and municipal building codes, covers live loads due to human occupancy, industrial or commercial occupancy, roof loads, movable partition loads, and wind pressures.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, BH14; 1925. Recommended Minimum Requirements for Fire Resistance in Buildings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS17; 1939. Sound Insulation of Wall and Floor Constructions and 1940 Supplement. This report summarizes the data obtained in tests at the National Bureau of Standards on the sound transmission of wall, partition, and floor panels and gives a general discussion of the principles of sound insulation. A general discussion is given of the factors which determine the transmission of sound through partitions. Impact noises and methods of insulating against them receive special mention.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS19; 1939. Preparation and Revision of Building Codes. In this discussion a description is given of how such work is done and useful sources of technical information are indicated. Some of the problems that are encountered by local committees are mentioned, including what basic principles are involved; methods of presentation, arrangement, and numbering; advantages of using national standards and ways of referring to them; methods of recognizing new materials and new methods of construction; extent of delegation of authority to the building official and safeguards against arbitrary action; and other questions of major importance.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS33; 1939. Plastic Calking Compounds. The purposes of this investigation of calking compounds were: (1) To develop simple test procedures and obtain data for use in specifications, (2) to study compositions and physical properties in relation to performance, and (3) to study the installation and service conditions which have a bearing on performance and durability. A large number of commercial samples were collected and numerous experimental compounds were prepared in the laboratory. Chemical analyses were made of the commercial compounds. Physical tests were made on both commercial and experimental compounds. Laboratory studies have been supplemented, as far as possible, with exposure tests and inspections of actual installations.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS45; 1940. Air Infiltration Through Windows. Tests were conducted on double-hung wood windows and light steel casements, types frequently specified for low-cost housing construction. Infiltration measurements were made for systematic sets of clearance conditions and correlations between amount of clearance and infiltration are given. The results are summarized, using a concise method for representing the relationship between air infiltration and test pressure. Relationships between average sash clearance and infiltration at the reference pressure of 0.2 in. of water are given and a general type of relation between infiltration and pressure is suggested on the basis of the test results.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS52; 1940. Effect of Ceiling Insulation Upon Summer Comfort. This investigation deals with the effect of insulation in limiting the temperature rise of the rooms in the upper story of a building with a flat roof. For test purposes a structure was built on the roof of one of the buildings at the National Bureau of Standards. This structure has a "flat" (slightly sloping) roof, below which is a low attic separated from the room below by a ceiling of plasterboard. Various types of insulation were installed just above this ceiling to insulate it from the attic space. The temperature of the ceiling in the room below was measured and the effect of the insulation in limiting the rise in the temperature of the ceiling was determined.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS 78; 1941. Structural, Heat-Transfer, and Water-Permeability Properties of Five Earth-Wall Constructions.

For the program on the investigation of low-cost house constructions, specimens representing adobe, bitudobe, monolithic terracrete, terracrete-block, and rammed-earth walls were constructed with the Cooperation of the Office of Indian Affairs and the National Youth Administration. These specimens were subjected to structural, heat-transfer, and water-permeability tests. Sixty structural specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. The transverse, concentrated, and impact loads were applied to one face. The loads simulated those to which elements of a house are subjected in actual service. The deformations under load and the sets after the load was removed were measured for each increment of load. Five heat-transfer specimens were subjected to a temperature differential that might occur in actual service. Five water-permeability specimens were tested under conditions that simulated exposure to a heavy, wind-driven rain.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS81; 1942. Field Inspectors' Check List for Building Construction. Outlines items suggested for periodic inspection. The arrangement of the list was selected for the convenience of the field inspector and to insure that the various steps will be checked in their proper sequence. To amplify specific items in the check list and to avoid unnecessary repetition, the work of certain trades has been treated more fully in the appendixes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS87; 1942. A Method for Developing Specifications for Building Construction. Report of Subcommittee on Specifications of the Central Housing Committee on Research, Design, and Construction. Advocates a directive method which, under proper supervision, should condense specifications, bring about important economies, and increase efficiency. Fundamental principles that have proved of value over a period of years have been retained and are coordinated in a basic specification which promotes uniformity and permits choice of those materials and methods of construction best suited to the specific project in hand. Application of the method is made clear by three examples—a model basic specification illustrating the procedure outlined, a typical contemporary specification, and the typical specification rewritten in accordance with the method advocated.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS 88; 1942. Recommended Building Code Requirements for New Building Construction With Special Reference to War Housing. Includes recommended requirements for general items, definitions, fire-resistance, classifications, general building restrictions, light and ventilation, exits, construction (working stresses, loads, soil-bearing capacity, foundations, masonry, reinforced concrete, reinforced brick, chimney, steel and iron, and wood construction), fire protection, chimneys and heating appliances, safeguards against accidents, electrical work, and plumbing; and an appendix of information to assist in interpreting and enforcing the code requirements.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-397. Storm Entrance for Type "S" Bldg., Construction of.

U. S. Gov., Dept. of Labor, Division of Labor Standards. Special Bulletin 7; 1942. Suggested Standards for Industrial Safeguards. Railing and Toeboards. Covers metal and wood toeboards.

U. S. Gov., Federal Housing Administration. Minimum Construction Requirements. These requirements provide a Minimum Standard of Construction and shall apply to all new construction on which the mortgage is insured by the Federal Housing Administration. They are considered necessary to produce a well-constructed dwelling which will serve as sound security for a long-term mortgage loan. Since these requirements are essentially minimum, they are not to be built down to but form a basis from which to build up. Copies are available in the F.H.A. insuring offices throughout the U. S. Include requirements for excavation, masonry, adobe construction, structural steel and iron, lumber, wood framing, termite prevention, roof coverings, sheet metal, lathing, plastering, stucco, painting, plumbing, heating, electrical work, etc., according to geographical location and local building code requirements.

References.—Sand, gravel, broken stone, slag, *see* 512; cement, concrete, *see* 516.1, 516.3; brick, building tile, roofing tile, terra cotta, glazed tile, mosaic, *see* 534; sand lime brick, *see* 513; granite, limestone, marble, sandstone, *see* 511; gypsum tiles and blocks, *see* 514.62; brick masonry, *see* 518.83; rubble and ashlar masonry, *see* 518.81, 518.82; steel reinforcement, *see* 605.25; wooden lath, *see* 402.51; metal lath, *see* 605.24; wooden shingles, *see* 402.52; asphalt roofing, tar roofing, *see* 505.16, 505.36; yard lumber, *see* 402.4, 411; slate roofing, *see* 511.52; structural timbers, *see* 412; millwork, *see* 423; plaster, *see* 514; drains and sewers, *see* 518.6; steel buildings and metal parts of buildings, *see* 605.22; eaves troughs and conductor pipe, *see* 607.5; industrial building construction for prevention of dust explosions, *see* 782, 789; accident prevention in construction, *see* 518.0

518.51 Buildings and Dwellings

American Foundrymen's Assn. Code of Recommended Practices for Industrial Housekeeping and Sanitation, 1944. Covers scope, requirements, definitions, housekeeping, ventilation, lighting, water for human consumption, toilet rooms, wash and locker rooms, rest rooms for women, lunch rooms, and appendix.

American Transit Assn. Recommended Practice for Operating Bus Garage Layouts, W136-30; 1930. These practices relate to selection of site, architectural features of building proper, location of building on site, heating and ventilation, lighting, details to be considered in layout of garages, location of work areas, gasoline storage, oil and grease storage, and tire service and storage rooms.

American Transit Assn. Recommended Regulations for Construction and Protection of Bus Garages, W137-34; 1934. These regulations are intended to provide reasonable safeguards against the fire hazards of garages. Garages intended to come within the scope of these recommended good practice requirements are bus or truck garages, and other garages in which more than three motor vehicles are housed or kept and/or in which repairs involving open flames, spark emitting devices, or highly heated parts are made.

These regulations, when adopted, to conform to corresponding regulations of the National Fire Protection Assn.

American Transit Assn. Wiring, Construction, Maintenance, and Protection of Car and Trolley Bus Houses, Yards, and Auxiliary Buildings, W141-35; 1935. The rules referred to in these regulations are identical with the regulations of the National Board of Fire Underwriters for electric cars and trolley busses, including houses and yards.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-22; 1927. Lineman's Tool House. Dimensional drawing of typical floor plan.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 11.71; 1940. Pyroxylin Plastic, Its Hazards, and Special Precautions Needed for Storage and Handling. Includes recommendations for storage cabinets and vaults.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 11.80; 1938. Acetylene and Its Generation. Safeguards for Industrial Installations. Includes recommendations for generator house of fire-resistive construction and for three types of generators.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume 1. Structural Details, 1938. For buildings supporting tanks, requirements as to footings on brick supporting walls, design of anchorage, allowable bearing pressures for supports of various building materials. Concrete buildings according to A.S.T.M. specifications for concrete.

National Assn. of Building Owners and Managers. Sheridan-Kackow Formula for Determining Rental Value of Office Space. Revised, 1941. Includes explanatory data, key to computations, definitions, rental schedule foundation, adjustments required for group comparisons, formula to reflect the relative value of various kinds of space within any given building in relation to the base rate of that building, definition of base rate, and explanatory footnotes on formula.

National Board of Fire Underwriters. Fire Prevention and Protection as Applied to Hotels, 1936. Covers hazards including lighting, heating, storage of fuels, power plants, ventilation, incinerators, kitchens, refrigeration and air conditioning, shops, painting, laundry, motion pictures, smoking, storage rooms, and decorations; construction including year-round hotels, apartment hotels, and seasonal or resort hotels; new construction; existing construction; and protection including automatic sprinklers, standpipes, chemical extinguishers, private fire brigades, fire alarm system, and outside protection.

National Board of Fire Underwriters. Fire Prevention and Protection as Applied to the Public and Parochial Schools, 1939. Covers limitation of heights, restricting floor areas, danger of floor openings, emergency exits—fire escapes, light and power, heating system as a fire cause, protecting the coal pile, ventilation, auditorium and cafeteria, importance of good housekeeping, automatic sprinkler systems, standpipe as an aid in fire fighting, importance of suitable chemical extinguishers, fire drills, fire alarm system, and safety through self inspection.

National Board of Fire Underwriters. Fire Prevention and Protection as Applied to Hospitals, 1941. Covers construction; fireproof construction; nonfireproof construction; hazards including lighting, heating, incinerators, ventilation, kitchens, refrigeration, laundry, dry cleaning, sewing room, laboratories, X-ray laboratory and film storage, pharmacy, combustible anaesthetics, operating rooms, oxygen chamber, and housekeeping; and protection including automatic sprinklers, standpipes, chemical extinguishers, fire drills, fire alarm system, and outside protection.

National Board of Fire Underwriters. Airplane Hangars, No.85; 1943. Standard good practice requirements for the construction and protection of airplane hangars. Covers height, area, for sprinkled and unsprinkled hangars; types of construction in order of preference, floor drainage, fire doors, lighting, power, heating, permissible repairs in hangars, construction of doping room, housekeeping and smoking, and fire protection appliances.

National Board of Fire Underwriters. Construction and Protection of Garages, No.88; 1932. Recommended practice for garages where more than three vehicles are kept, including buses and trucks. Construction, basement garages, lighting, power, heating, ventilation, repair work, storage of flammable liquids, housekeeping, automatic sprinklers, and fire protection.

National Board of Fire Underwriters. Construction of School Buildings and Improvement of Existing Structures, 1937. Recommendations as to fireproof or semifireproof construction, maximum heights, floor areas, and exit facilities; special hazards such as cafeterias, laboratories, shops, etc.; boiler rooms; also the improvement of existing buildings, fire partitions, stair enclosures, fire doors, etc.

National Fire Protection Assn. American Standards Assn., A 9-1940. Building Exits Code. Requirements on width, construction, materials, design, arrangements, inclosure, etc., for stairs, horizontal exits, doors, slide escapes, elevators and escalators, installation of lighting and alarm systems, etc.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Hose Houses for Mill Yards. Standards for hose houses for mill yards. Covers location, foundations, material, size, frame, roof, doors, hose shelves, floors, ventilation, hardware, painting, required apparatus, hose, hydrant gates or cut-off valves, couplings, nozzles, coupling spanners or wrenches, domestic service use prohibited, and rack for washing and drying hose.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Rooms, Cabinets, and Outside Houses for the Storage of Flammable Liquids. Covers standards for the construction of inside storage or mixing room, storage cabinets, and outside storage houses.

National Fire Protection Assn. Protection of Records, 1939. Includes compilation of committee reports. Covers introduction, value of records, classification of records, record losses, construction equipment and maintenance of buildings, severity, duration and control of exposure, fire exposure conditions for vaults and portable record containers. Protection of records by duplication, document buildings, vaults and vault doors, file storage rooms and doors, fire protection equipment for vaults and file storage rooms, safes, substandard and commercial record containers, salvage of fire damaged records, destruction of records no longer useful, codes for preservation of records, protection of local archives, and use of protective equipment.

National Fire Protection Assn. Protection of Records, 1939. Includes summary of good practice requirements for the protection of records. Covers introduction, protection of records, survey and classification of records, survey of building, providing protection, handling of records, and disposition of useless records.

Portland Cement Assn. Concrete for Industrial Buildings and Garages, 1939. Includes concrete floors on fill, floor framing, columns, live load, stairs, walls, fire resistance, roofs, extensions, expansion anchors, inserts, pipe sleeves, etc.; dimensions of automobiles, layout of parking units, framing plans, ramps, and structural details.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 469. Shelter; Weather-Instrument, U. S. Weather Bureau Cotton Region.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, BH18; 1932. Recommended Minimum Requirements for Small Dwelling Construction. Recommendations of building code committee on thickness, height, and bonding of exterior walls, proportions of piers, bearing areas of arches and lintels, quality and strength of the building materials used, recommended types and details of construction for economy, strength, and fire protective qualities for various types of masonry and frame construction.

References.—Building construction, general items, *see* 518.50; miscellaneous building construction items, *see* 518.59; steel buildings and metal parts of buildings, *see* 605.22; sheet metal work, metal doors and trim, tin clad fire doors, *see* 605.22; sheet metal roofing, *see* 604.3; *see* references under 518.59.

518.52 Foundations for Buildings

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Pile Foundations. Covers the investigation, design, and construction of pile foundations.

Portland Cement Assn. Specifications for Concrete Footings and Concrete Masonry Walls, 1939. Gives general requirements, materials in accordance with A.S.T.M. specifications, construction of footings, and hollow block wall construction. Includes below-grade construction, wood or concrete sill attachment, masonry back-up tile, coping and parapet walls, methods of installing ducts and conduit, and illustrations of procedures.

References.— Cement, concrete and mortar, *see* 516.1, 516.3; sand, gravel, broken stone, slag, *see* 512; reinforcement steel, *see* 605.25; building construction, *see* 518.50, 518.51.

518.53 Walls and Partitions for Buildings

American Society for Testing Materials, ES-19; 1942. Emergency Specifications for Structural Insulating Board (Thermal Insulation). Cover thermal insulating material made principally of vegetable fiber in the form of insulating board suitable for structural purposes.

Metal Lath Manufacturers' Assn. Standard Metal Lath Specifications for Better Plastering and Concrete Stucco. Includes nomenclature for metal lath construction; requirements for material; size, weight, and spacing of attaching devices; minimum requirements for plastered metal stud partitions and standing or wall furring; minimum requirements for furred contact or suspended ceiling construction for the soffits of steel beams, purlins or joists, or concrete or hollow tile floor arches or roofs; corner and joint reinforcement; erection of metal lath; and appendix of general notes on plastering and stucco, solid and soundproof partition details, and plaster beams and cornices.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 112-43; 1943. Homogeneous Fiber Wallboard. Covers one type of homogeneous fiber wallboard of a nominal thickness of 5/16 in., 4 ft. wide, and 6 to 12 ft. long. Gives requirements for composition, treatment for destruction of rot-producing fungi, surfaces, edge finish, physical properties, standard commercial sizes, and tolerances; method of sampling and testing; and packing and marking.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS61; 1940. Structural Properties of Two Nonreinforced Monolithic Concrete Wall Constructions. The Masonry Construction Section of the National Bureau of Standards built 24 specimens representing two nonreinforced monolithic concrete wall constructions. The only difference in their construction was in the proportions of the concrete. The specimens were subjected to compressive, transverse, impact, concentrated, and racking loads. For each of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for each increment of load. The results are presented in graphs and a table.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS63; 1940. Moisture Condensation in Building Walls. Moisture condensation in insulated walls will occur under certain conditions. This paper discusses these conditions in a general way and makes available to architects, builders, and others information concerning factors which control humidity in walls. These factors are presented so as to make possible estimates of the probability of moisture condensation in walls of dwellings if the factors governing it such as design, structural materials, construction details, and moisture conditions inside and outside the building are known.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS76; 1941. Effect of Outdoor Exposure on the Water Permeability of Masonry Walls. The water permeabilities of about 100 small masonry-wall specimens were measured before and after exposing them to the weather at Washington, D. C., for a maximum period of 3 yrs. Some of the more permeable walls had been waterproofed before exposure, and the durability of the waterproofing treatments, as well as the structural appearance or condition of the walls was also determined.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-354. Building, Type "S", Prefabricated Partition Panels.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 7Yg; 1934. For Roofing, Siding, and Sheet Metal Work; Dampproofing and Membrane Waterproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 11Yc; 1939. Marble and Tile Work. Includes requirements for water closet and shower enclosures and stalls.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 15Yb; 1934. Standard Methods for Inspection of Materials for Roofing, Siding, Sheet Metal Work, Dampproofing, and Waterproofing.

References.— Building construction, *see* 518.50, 518.51; *see* references under 518.50.

518.54 Inclosures

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 11.71; 1940. Pyroxylin Plastic, Its Hazards, and Special Precautions Needed for Storage and Handling. Includes recommendations for storage cabinets and vaults.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 11.80; 1938. Acetylene and Its Generation. Safeguards for Industrial Installations. Includes recommendations for generator house of fire-resistive construction and for three types of generators.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 21.71; 1938. Winter Protection for Dry-Pipe Valves. Includes recommendations for insulated wood-frame frost enclosures.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.28-1941. Recommended Practice for Motion Picture Theater Projection Rooms. Projection lens height, projection angle, observation port, projection lens mounting, projection lens focal length, projection objectives, and focal markings.

Underwriters' Laboratories, Inc. Standard for Bandit Resisting Enclosures, Subject 752; 1942. Applies to the installations of bullet-resisting materials in the form of complete bandit-resisting enclosures designed to protect against robbery of persons handling money or securities within the enclosure during business hours. Gives design and construction, general test procedure, maintenance, and certification of installations.

References.— Building construction, *see* 518.50, 518.51; *see* references under 518.50.

518.55 Chimneys for Buildings

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Steel Chimneys—Riveted; Steel Chimneys—Welded; Genuine Wrought Iron Chimneys—Welded; Brick Chimneys; Reinforced Concrete Chimney; and Reinforced Brick Masonry Chimney. Gives requirements for design, workmanship, and construction.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 7.62; 1940. Factory Chimneys—Concrete and Brick. Specifications for the erection and repair of chimneys more than 50 ft. high.

Clay Products Assn. Tentative Standards for Vitrified Clay Products, 1937. Includes fire clay flue linings, rectangular and circular, and glazed tile flue or chimney pipe and fittings. Gives weights and standard dimensions of tile.

Clay Sewer Pipe Assn., Inc. Handbook Vitrified Clay Sewer Pipe and Kindred Clay Products, 1942. Includes dimensions and weights of salt glazed vitrified clay flue linings and fittings and chimney tops and bases.

References.—Fire clay flue linings, clay stove pipe, *see* 534.29; building construction, *see* 518.50, 518.51; regulations on chimney sizes for house heating boilers, *see* 614.4; *see* references under 518.50.

518.56 Floors for Buildings

American Hospital Assn., 25-7. Asphalt Tile. Covers one grade. Based on U. S. Gov. Federal Specifications SS-T-306 for Asphalt Tile.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Membrane Waterproofing. Gives requirements for premoulded asphalt blocks.

American Wood-Preservers' Assn., 19b; 1923. Standard Specification for Interior Creosoted Wood-Block Flooring. Gives timber, size of blocks, preservatives, treatment, handling blocks after treatment, inspection, subgrade, foundation, laying the blocks, bituminous filler, and melting point test.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 4.20; 1938. Watertight Floors. Covers methods for improving construction where floor leakage is a serious defect. Includes description of common methods of waterproofing (hot asphalt mastic flooring, emulsified asphalt flooring, magnesite composition flooring, and light weight special surfacing), recent developments in waterproofing, and general precautions.

Maple Flooring Manufactures Assn. Grading Rules for Northern Hard Maple (Acer Saccharum), Beech, and Birch Flooring, 1941. Includes description of individual characteristics of Northern hard maple and of Northern beech and birch flooring; grading rules for First, Second, Third, and three Special grades; standard measurement; kiln-drying; end matching; custom in bundling; thicknesses and faces; rules for estimating quantity of flooring required; grade-use recommendations; and uses of different thicknesses.

National Board of Fire Underwriters. Waterproofing of Floors and Drainage, and Installation of Scuppers, No.92; 1937. Suggested practice for prevention of water damage during fires and other emergencies by use of asphalt mastic flooring, protected membrane flooring, magnesite flooring, asphalt emulsion flooring, rubber and asphalt tile, and linoleum floors; disposal of water through scuppers in the walls, floor drains, ramps in doorways where flammable liquids may be discharged, skids under stock subject to water damage, etc.

Portland Cement Assn. Concrete Floor Finishes, 1938. Includes standard, heavy-duty, and resurfacing concrete floor finish, decorative concrete floor finishes as terrazzo, concrete tile and art marble, colored pigment cement floors, stained floor finish, painted finish, armored concrete floor finish, acid-proof and nonslip floors, linoleum, rubber and cork tile floors, carpeted floors; specifications for construction, surfacing, and curing; hardening treatments to overcome dusting, cracking, and cleaning of floors.

Portland Cement Assn. Specifications for Precast Joist Concrete Floors (With Cast-in-Place Concrete Slab), 1939. Requirements for precast joists as to strength, curing, and reinforcement; joist hangers, setting joists, cast-in-place slab, finish and curing, with illustrations of methods.

Tile Manufacturers' Assn. Basic Specification for Tile Work, K-300; 1939. Recommendations for the installation of tile in new construction and alterations on vertical and horizontal surfaces; for application over wood, masonry, concrete, or steel joist; for preparation of base, quality of materials, mortar mixtures, etc.

Tile Manufacturers' Assn. Tile Industry Research Bureau, R-TS-51; 1939. Specification for Installing Tile Floors on Thin Mastic Setting Bed. For installation over wood, cement, steel, roof decks, old terrazzo, natural stone, and tile floors, etc.; applicable to interior and exterior horizontal surfaces only (except ceilings) in hot or cold climates. Requirements for flexible binder, preparation of subfloor, priming, laying and grouting of tile, and precautionary measures.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. For equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons, and accessible only to such persons. They also apply to similar equipment if installed in factories, mercantile establishments, vehicles, or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts. Recommendations on floors of battery rooms housing large batteries comprised of cells in lead lined tanks.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS43; 1940. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 2. In the second series, 40 test installations were subjected to a performance test in the floor-testing chamber of the National Bureau of Standards. Included in the tests were battleship linoleum, rubber in sheet and tile form, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of asphalt tiles. The bonding agents used included lignin pastes, resinous cements, latex adhesives, rubber cements, cut-back asphalt, and asphalt emulsions. Installations were made on both concrete and wood subfloors. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries showing the performance of the test panels are given, and the appearance of the different floor coverings after 48,000 cycles of the testing equipment is shown by representative photographs.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS62; 1940. Structural Properties of a Precast Joist Concrete Floor Construction Sponsored by the Portland Cement Assn. The Portland Cement Assn. submitted six specimens representing a floor construction which consisted of precast concrete joists and bridging and a reinforced-concrete floor slab. The specimens were subjected to transverse, impact, and concentrated loads. All loads were applied to the upper faces of the specimens. For each of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for each increment of load. The results are presented in graphs and in a table.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS68; 1941. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 3. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a third series of 40 test installations. Included in the test were linoleums in sheet and tile form, cork-composition tile, sheet rubber, rubber tile, asphalt tiles, fiberboard tiles, felt-base floor coverings having various wearing surfaces, three monolithic floors, and a number of wood floors. The bonding agents used included lignin pastes, cumar-resin cement, alumina cement-latex paste, rubber cements, various asphaltic adhesives, and nails. Installations were made on concrete, stripwood, and plywood subfloors. Installations on stripwood subfloors were made with underlays of dry and asphalt-saturated lining felts. Descriptions of the testing equipment and test installations are given. Results showing the relative depth of the depressions in the floor coverings during the test are presented in tables. Brief summaries of the manner in which the various test installations performed are given and photographs of the test panels after 48,000 cycles of the testing equipment are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report

BMS73; 1941. Indentation Characteristics of Floor Coverings. The indentation characteristics of 64 floor coverings were determined. Tests were conducted on specimens conditioned in an atmosphere of 65-percent relative humidity and 72° F. temperature, on specimens after exposure to accelerated aging, and on specimens at an elevated temperature of 90°F. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, wood, fiberboard, and monolithic compositions. Variations in composition and thickness were included in many of the types. The apparatus and the procedure are briefly described. Summaries of the results are presented to show the relative merits of the various floor coverings with respect to comfort value and permanent indentation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS80; 1942. Performance Test of Floor Coverings for Use in Low-Cost Housing: Part 4. A performance test was conducted in the floor-testing chamber of the National Bureau of Standards on a fourth series of 40 different installations involving 26 different floor coverings. Specimens of most of the floor coverings were installed on both a concrete and a wood subfloor. Included in the test were cork tiles, rubber tile containing aluminum oxide aggregate, asphalt tile, marbleized linoleums, felt-backed floor coverings having various wearing surfaces, strip maples, maple unit-block, pecan unit-block, asphalt mastic, coal-tar mastic, alumina cement-rubber latex composition, magnesium oxychloride composition, and 1:2:4 Portland cement concrete. Different underlays and adhesives were also included in the test. The test installations are described and results showing the depth of the depressions in the floor coverings made by the equipment are presented in tables. Brief summaries of the manner in which the various installations performed are given, and their appearance at the end of the test, is shown by photographs. A few generalized comments and conclusions are made.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS85; 1942. Dimensional Changes of Floor Coverings With Changes in Relative Humidity and Temperature. The floor coverings tested included such general types as linoleum, cork, rubber, felt base, asphalt, stripwood, plywood, fiberboard, and several monolithic compositions, such as cement mortar and magnesium oxychloride. Dimensional changes due to a variation in relative humidity from 8 to 86 percent and those due to a variation in temperature from 32° to 90° F. were determined. The floor coverings, testing equipment, and procedure are described and the results are presented in graphic form.

U. S. Gov., Federal Specification SS-T-306a; 1943. Tile; Asphalt. Covers one type and one grade. Gives requirements for material, workmanship, color, finish and surface characteristics, bid sample, size, thickness, identation, impact, flexure, and curling; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Conditioning of Subfloor (for bituminous wearing course).

References.—Tile flooring, *see* 518.59, 534.25; wood flooring, *see* 411.2; hollow flooring tile, *see* 534.22; building construction, *see* 518.50, 518.51; *see* references under 518.50.

518.57 Ceilings and Roofing for Buildings

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Built-Up Roofing. Gives requirements for materials (pitch, asphalt, asphalt primer, roofing felt, ready or prepared asphalt roofings, flashings, gravel, and slag); tarred rag felt, pitch and gravel (or slag) over wood or precast units (type A-1), and over homogeneous roofs cast in place (type A-2); tarred rag felt, steep roofing pitch and slag for use over wood or precast concrete or gypsum units (type A-3), and over homogeneous roofs cast in place (type A-4); asphalt rag felt, asphalt and gravel (or slag) over wood or precast units (type B-1), and over homogeneous roofs cast in place (type B-2); asphalt impregnated asbestos felt and asphalt (smooth surface) over wood or precast units (type C-1—classes 1, 2, and 3), and over homogeneous roofs cast in place (type C-2—classes 1, 2, and 3); and asphalt rag felt and asphalt (smooth surface) over wood or precast units (type D-1), and over homogeneous roofs cast in place (type D-2).

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Specifications for Metal Lath Ceiling Construction. Includes furred ceiling construction, suspended ceiling construction, and contact ceiling construction with removable and permanent forms, integral ceiling construction, gauge and placing of furring rods, channels, and lathing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 7Yg; 1934. Roofing, Siding, and Sheet Metal Work; Dampproofing and Membrane Waterproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 15Yb; 1934. Standard Methods for Inspection of Materials for Roofing, Siding, Sheet Metal Work; Dampproofing and Waterproofing.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-13A; 1933. Roofing; Built-Up, Type 4-AWS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-14A; 1933. Roofing; Built-Up, Type 5-AWS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-15A; 1933. Roofing; Built-Up, Type 3ACS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-16A; 1933. Roofing; Built-Up, Type 4ACS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-17A; 1933. Roofing; Built-Up, Type 5ACS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-18A; 1933. Roofing; Build-Up, Type 3TCS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-19A; 1933. Roofing, Built-Up, Type 4TCS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-20A; 1933. Roofing; Built-Up, Type 5TCS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-21B; 1943. Roofing; Built-Up, Type 4TWS, Construction of.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-22A; 1933. Roofing; Built-Up, Type 5TWS, Construction.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-23A; 1933. Flashing; Metal, Installation of, With Bituminous Built-Up Roofing.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 81-24A; 1933. Flashing; Plastic, Installation of, With Bituminous Built-Up Roofing.

References.—Sheet steel and tin roofing, *see* 604.32, 604.31; asphalt roofing, tar roofing, *see* 505.16, 505.36; slate roofing, *see* 511.52; roofing tiles, *see* 534.23; wood shingles, *see* 402.52; ceiling lumber, *see* 411.3; building construction, *see* 518.50, 518.51; metal ceilings for buildings, *see* 605.22.

518.58 Beams and Columns for Buildings

References.—Building construction, *see* 518.50, 518.51; *see* references under 518.50.

518.59 Miscellaneous Specifications for Building Construction and Materials

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 4.0:1941. Miscellaneous Ammonia Standards. Cold Storage Room Insulation. Gives recommended thicknesses of insulation for certain required temperatures.

American Hospital Assn., 4-1. Prefabricated Acoustical-Units. Covers nine types. Based on U. S. Gov. Federal Specification SS-A-118 for Prefabricated Acoustical-Units; TT-E-506a for Enamel, Interior, Gloss, Light-Tints and White; and TT-P-51a for Paints, Oil, Interior, Eggshell-Flat-Finish, Ready Mixed and Semipaste, Light-Tints and White.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Includes clearance diagrams for railway bridges, turntables, tunnels, buildings and sheds adjacent to side tracks, warehouse and engine house doors, platforms, and equipment.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 7.13; 1940. Anchorage for Factory Roofs—Principles and Design Data. Includes basis of design, wind forces, suggested steps for designing roof anchorage, workmanship, foundations, calculations, suggested methods of roof anchorage, and tables of data used in designing roof anchorage.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 7.16 (1938), 7.17, 7.18, 7.19, and 7.20 (1939). Anchorage of Steel-Deck Roofs. A series of bulletins showing details of wind-anchorage methods for various types of steel-deck roofs.

Evaporated Milk Assn. Standards for Plant and Equipment, 1940. For construction and operation of evaporated milk plant; requirements for floors, walls and ceilings, doors and windows, lighting and ventilation, protection from contamination, toilet facilities, water supply, hand washing facilities, milk piping, construction and repair of containers and equipment; cleaning and bactericidal treatment of milk piping, containers and apparatus, etc.

National Assn. of Marble Dealers. Interior Marble Work, 1926. Explanatory of the material a specification for interior marble work should contain, includes grouping of marbles according to properties for finishing, kinds of finish and where used, standard and minimum thicknesses for marble for different applications, recommended details and methods of construction, 42 plates illustrating typical installations.

National Board of Fire Underwriters. Coloring and Ripening of Fruits and Vegetables, No.57; 1938. Recommended practice against fire and explosion hazards of process. Includes bananas, citrus fruit, apples, pears, tomatoes, celery, etc. Requirements for use of ethylene gas, open flames, gas heaters, kerosene stoves, electric wiring, and general precautions.

National Board of Fire Underwriters. Construction of Merchandise Vaults, No.84; 1930. Regulations for storage of fur, silk, and other merchandise, but not intended for highly flammable materials. Requirements as to materials and thickness of walls, floors, and ceilings, under supports, water-tightness, fire resistance of doors, ventilation, lighting, refrigeration, and fire extinguishing equipment.

National Board of Fire Underwriters. Construction and Protection of Piers and Wharves, No.87; 1935. Recommended practice for two types of substructure depending on harbor conditions; steel and reinforced concrete, sheet iron or asbestos on steel frame, and heavy timber superstructures. Includes also fire walls, fire doors, and fire stops, bulkheads, and requirements for automatic sprinkler systems, watch service, and safeguarding hazards.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Protection of Piers and Wharves. Includes subdivision of combustible substructures, protection of combustible substructures, fire protection, first aid fire appliances, watch service, fire alarm, and fire brigade.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Petroleum Wharves. Suggested ordinance regulating location, design, equipment and protection of piers and wharves at which flammable liquid cargoes are transferred in bulk, and providing safeguards for such transfer operations.

National Fire Protection Assn. Protection of Records, 1939. Includes compilation of committee reports. Covers introduction, value of records, classification of records, record losses, construction equipment and maintenance of buildings, severity, duration and control of exposure, fire exposure conditions for vaults and portable record containers. Protection of records by duplication, document buildings, vaults and vault doors, file storage rooms and doors, fire protection equipment for vaults and file storage rooms, safes, substandard and commercial record containers, salvage of fire damaged records, destruction of records no longer useful, codes for preservation of records, protection of local archives, and use of protective equipment.

National Fire Protection Assn. Protection of Records, 1939. Includes summary of good practice requirements for the protection of records. Covers introduction, protection of records, survey and classification of records, survey of building, providing protection, handling of records, and disposition of useless records.

Safe Manufacturers' National Assn. Specification for Fire Insulated Vault Doors, F3; 1939. For maximum protection of business records from fire and definite measure of resistance to burglarious attack; three types based on fire resistance, methods of test for fire resistance, and for hose stream test.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. SAE Standard Reference Screen Room for the Inspection and Testing of Radio Noise Suppression. Adopted, 1942. Size and general construction and arrangement of the standard reference screen room and optional construction details and arrangements.

U. S. Gov., Army Air Forces. Specification 24685-A; 1941. Bombing Ranges and Related Equipment.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Lookout Towers.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-50. Buildings; Type "S", Fabrication.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-51. Building; Type "S" Radio Transmitter, Erection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-52. Building; Type "S" Watch House, Erection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-53. Building; Type "S" Power Shed, Erection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-54. Building; Fan Marker, Shed, Erection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-55. Building; Type "S" Diesel Shed, Erection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-56. Building; Type "S" Special Transmitter, Erection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-241. Building; Type "S" Prefabricated, UHF Range, Erection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-328. Remote Receiving Tuning House.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-381. Buildings; Concrete Foundations for Watch Houses.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-389. Buildings; Prefabricated, for UHF Antenna Housing.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-447. Building; Sectional for UHF Antenna Housing.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-477. Engine-Generator Power Plant; 60-Cycle, 240-V., 5-KVA.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C436; 1942. Low-Cost Glazes for Structural Clay Products. Three groups of clays, consisting of three shales, three surface clays, and two fire clays, were investigated to determine their glaze-making properties when used as integral parts of glaze compositions. The clay-whiting ($CaCO_3$) composition which deformed at the lowest temperature was determined for each clay and served as the major portion of the glaze composition applied to tile made of that clay. Fluxing materials and potter's flint, when needed to control fusibility, texture, and glaze fit, were incorporated. Six different fluxes and eight different materials for producing glaze colors were investigated. The data are presented in 3 figures and 19 tables.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R87-32; 1932. American Standards Assn., A48-1932. Sizes of Removable and Permanent Forms, Pans, or Domes Made of Wood, Steel, or Other Material Used in Concrete Ribbed Floor Construction. Simplified practice recommended and accepted by industry establishing a limited number of standard stock sizes for forms, standard widths and depths.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M151; 1935. Design and Construction of Building Exits. To aid those interested in the problem, surveys of current practice in providing exits and of the rates at which people can effect their escape through different kinds of exits have been made. The methods employed in the surveys and the results are presented here in detail. To supplement the information thus obtained, opinions have been solicited from numerous architects, building officials, fire-protection experts, and others. Five methods of calculating exit width in current use are discussed. As a useful reference when local requirements are under consideration, suggested requirements are presented, together with notes on the reasoning employed in connection with them.

U. S. Gov., Federal Specification SS-A-118; 1939. Acoustical-Units; Prefabricated. Covers nine types identified by their texture, surface appearance, and composition. Gives requirements for classes for auditorium treatment, noise reduction, material, and workmanship; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Marine Corps Specification. Balk Pier; Temporary, 10-Ton, Model 1940.

U. S. Gov., Marine Corps Specification. Chess for Pier; Temporary, 10-Ton, Model 1940.

U. S. Gov., Marine Corps Specification. Sill for Pier; Temporary, 10-Ton, Model 1940.

U. S. Gov., Marine Corps Specification. Trestle for Pier; Temporary, 10-Ton, Model 1940.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 7Yg; 1934. Roofing, Siding, and Sheet Metal Work; Dampproofing and Membrane Waterproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification E-9Ye; 1943. Electrical Apparatus, Distributing Systems, and Wiring (Emergency Edition). Includes requirements for standard transformer vault.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 15Yb; 1934. Standard Methods for Inspection of Materials for Roofing, Siding, Sheet Metal Work; Dampproofing and Waterproofing.

U. S. Gov., Navy Dept. Specification 52C12a; 1940. Compound; Calking, for Metal Seams and Airports.

U. S. Gov., Navy Dept. Specification 59B4a; 1945. Blanket; Sound-Absorbing.

U. S. Gov., Navy Dept. Specification 59D1; 1943. Decking-Tile, Composition; and Adhesive (for Wet Spaces) (Shipboard Use).

U. S. Gov., U. S. Maritime Commission. Specification 32-MC-1; 1941. Insulation; Mineral Wool, Blanket Type. Shall be mineral wool felt, blanket form, without covering. Gives requirements for material and workmanship, thickness, density, fire-retardant properties, resistance to corrosion, resistance to bacteria, integrity, miscellaneous properties, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 32-MC-2; 1941. Insulation; Mineral Wool, Block Type, for Use Below 225° F. Shall be mineral wool felt in block form with or without moisture-repellent treatment. Gives requirements for material, workmanship, construction, surfaces, dimensions, edge finish, fire-retardant properties, resistance to corrosion, resistance to bacteria, resistance to moisture, miscellaneous properties, sampling, inspection, and tests.

References.— Building Construction, *see* 518.50, 518.51; *see* references under 518.50.

518.6 DRAINAGE STRUCTURES

518.60 General Items

American Assn. of State Highway Officials, T33-42. Standard Methods of Testing Culvert Pipe, Sewer Pipe, and Drain Tile. Covers tests for concrete pipe, cast iron pipe, clay pipe and drain tile. Gives three-edge bearing method, sand-bearing method, absorption test, freezing and thawing test for drain tile, and test for resistance to action of acids for clay pipe.

American Public Works Assn. Sewers, J1-38; 1938. Specifications for complete sewer projects, including excavation, concrete and masonry work, pipe and pipe sewers, manholes, brick, precast concrete, vitrified tile, structural steel, iron and steel castings, piling, cement and aggregates, tables of dimensions of various classes of sewer pipe, etc., with tests for materials using A.S.T.M. methods.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Roadway Drainage. Covers the artificial surface and subsurface drainage of the cuts and fills which make up the roadbed as distinguished from the drainage of the natural surface of the ground by natural waterways.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Sewers and Drainage. Gives requirements for excavation, pumping and bailing, sheeting, grades, backfilling, vitrified sewer pipe, mortar, cement and sand, brick, manholes and catchbasins, cast iron covers, cast iron and reinforced concrete pipe, foundation drains, and special fittings.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1938. Sub-Surface Drainage. Covers soil moisture, soils, field test for soils, necessity for drainage, water cut-off, drainage of open soils, drainage of impervious soils, pipe drains, and French or rock drains.

American Society for Testing Materials, C 12-19; 1919. Recommended Practice for Laying Sewer Pipe. Includes preparation of trenches for pipe laying, foundations for pipe, laying of pipe, and backfilling of trenches.

518.61 Culverts and Culvert Pipe

American Assn. of State Highway Officials, M41-42. Standard Specifications for Reinforced Concrete Culvert Pipe. Gives scope, materials, design, Curing, physical test requirements, crushing strength tests, sizes and permissible variations, workmanship and finish, marking, inspection and rejection, and methods of testing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Jacking Culvert Pipe Through Fills. Describes method of jacking, number and size of jacks, protection of pipe against percolation and scour.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for the Placement of Concrete Culvert Pipe. Gives requirements for bedding, foundation, camber, backfill, embankment, jacking pipe through fills, and constructing culverts in tunnels.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Reinforced Concrete Culvert Pipe. Gives requirements for materials and construction and table of coefficients for computing moments and thrusts.

American Society for Testing Materials, C 76-41; 1941. Reinforced Concrete Culvert Pipe. Classes, basis of acceptance, materials, design and strength of standard strength and of extra strength, design, curing, test requirements, tolerances, workmanship and finish, and inspection and rejection.

U. S. Gov., Federal Specification SS-P-371; 1937. Pipe; Concrete, Non-Pressure, Non-Reinforced, and Reinforced. Covers two types—(I) nonreinforced of bell and spigot pattern and (II) reinforced. Gives requirements for materials, workmanship, dimensions, strength, and design; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bituminous Coated Corrugated Sheet Metal Culvert Pipe, Type 1.

U.S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bituminous Coated Corrugated Sheet Metal Culvert Pipe, Type 2.

U.S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Reinforced Concrete Culvert Pipe.

References.—Definitions and methods of test, *see* 500, 518.60; other specifications for culverts, *see* 518.41; sand, gravel, broken stone, slag, *see* 512; concrete and mortar, *see* 516.3; rubble and ashlar masonry, *see* 518.81, 518.82; vitrified clay pipe, *see* 531.5; corrugated sheet metal culverts, *see* 607.5; cast-iron culvert pipe, *see* 607.11; brick masonry, *see* 518.83.

518.62 Drains, Drain Tile, and Pipe

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Sewers and Drainage. Gives requirements for cast iron and reinforced concrete pipe.

American Society for Testing Materials, C 4-24; 1924. American Standards Assn., A 6-1925. Drain Tile. Covers farm, standard, and extra quality drain tile of concrete or of clay, disallowed materials in chemical composition, requirements on crushing strength and absorption test, visual inspection, and, where specified, freezing and thawing test requirements.

American Society for Testing Materials, C 75-41; 1941. Reinforced Concrete Sewer Pipe. Covers reinforced concrete pipe intended to be used for the conveyance of sewage, industrial wastes, and storm water. Class, basis of acceptance, aggregates, mixture, minimum and alternate designs, placing reinforcements, longitudinals, laps, welds, and spacing; joints and joint reinforcement; physical, crushing strength, and absorption test requirements and apparatus; sizes and permissible variations; workmanship and finish; marking and inspection and rejection.

American Society for Testing Materials, C 118-39; 1939. Concrete Irrigation Pipe. For conveying irrigation water under low heads; requirements for Portland cement, aggregates, mixture; design and permissible variations in dimensions, test specimen, strength tests by three-edge-bearing or sand-bearing method, hydrostatic test, absorption test, finish, and curing.

U. S. Gov., Federal Specification SS-P-371; 1937. Pipe; Concrete, Non-Pressure, Non-Reinforced, and Reinforced. Covers two types—(I) nonreinforced of bell and spigot pattern and (II) reinforced. Gives requirements for dimensions, strength, and design; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Underdrains.

References.—Definitions, methods of test, *see* 500, 518.60; sand, gravel, broken stone, slag, *see* 512; cement, concrete, and mortar, *see* 516.1, 516.3; vitrified clay pipe, *see* 531.5; clay drain tile, *see* 534.21; sewers and sewer pipe, *see* 518.67; cast iron drain pipe, *see* 607.11; sheet metal pipe, *see* 607.5; plain concrete pipe, *see* 518.67.

518.63 Curbs

American Public Works Assn. Specification for Stone and Concrete Curbs, C2-36; 1936. Includes requirements for granite, hard sandstone, bluestone and limestone, soft sandstone and limestone, header or protection curb, tests in accordance with A.S.T.M. methods, dressing and cutting, and setting in concrete. Also includes construction of concrete curb and combined curb and gutter including requirements for cement and aggregates, tested by A.S.T.M. methods, construction, and protection of finished work.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R102-33; 1933. Granite Curbstone. This recommendation establishes a simplified schedule of sizes of granite curbstone as follows—5 in. wide and 16 in. in depth when set in soil. The lengths shall be not less than 3 ft. for corners and not less than 4 ft. for straight curve, except when closures are required.

References.—Granite, limestone, sandstone, *see* 511.1, 511.2, 511.4; sand, gravel, broken stone, slag, *see* 512; cement, concrete and mortar, *see* 516.1, 516.3; brick, *see* 513, 534.11; street pavements, *see* 518.3; sidewalks, *see* 516.5.

518.64 Gutters

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bituminous Gutter.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Concrete Curb and Combination Concrete Curb and Gutter.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Grouted Rubble Gutter.

References.—*See* references under 518.63.

518.65 Catch Basins, Inlets, Manholes

American Public Works Assn. Sewers, J1-38; 1938. Includes specifications for manholes, wellholes and inlets; requirements for concrete and masonry construction, quality of brick, drip-stones, foundations, steps and ladder bars, frames and covers, using A.S.T.M. methods of test for materials.

American Society for Testing Materials, C 139-39; 1939. American Standards Assn., A73.1-1942. Concrete Masonry Units for Construction of Catch Basins and Manholes. For solid, precast, segmental units made from Portland cement and suitable aggregates. Specifies minimum compressive strength, maximum absorption, dimensions and permissible variations, visual inspection, marking, sampling, and testing.

Assn. of American Railroads, Telegraph and Telephone Section, 1-C-1; 1940. Communication Underground Conduit Construction. Includes construction of manholes, requirements for dimensions, junction manholes, excavation, floors, drainage, walls, pulling-in irons, manhole roofs, frames and covers, concrete work, reinforcement, etc.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Drop Inlets and Catch Basins.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification E-9Ye; 1943. Electrical Apparatus, Distributing Systems, and Wiring (Emergency Edition). Includes requirements for standard manholes.

References.—Sand, gravel, broken stone, slag, *see* 512; cement, concrete and mortars, *see* 516.1, 516.3; brick, *see* 513, 534.11; brick masonry, *see* 518.83; manhole and conduit castings, *see* 611.12.

518.66 Retaining and Head Walls

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Roadway Protection. Covers retaining structures in sliding cuts. Gives requirements for timber, concrete, and metal cribbing; and dry rubble, masonry, and concrete walls.

Portland Cement Assn. Concrete Shore Protection, 1939. For sea walls, revetment, and permeable groins; causes of erosion, theory of wave motion, wave pressure and velocity, factors influencing shore protection, etc.; design of curved face walls, stepped face walls, cellular type walls, light bulkhead walls, and sheet pile sea walls; design of open cellular groins, jetties, and illustrations of applications.

References.—Riprap, *see* 511.72; rubble and ashlar masonry, *see* 518.81, 518.82; brick masonry, *see* 518.83; stone masonry retaining walls, *see* 518.89.

518.67 Sewers, Sewer Pipe, and Drain Tile

American Assn. of State Highway Officials, M86-42. Standard Specifications for Concrete Sewer Pipe. Gives scope, materials, physical test requirements, acceptance or rejection of results of tests, sizes and permissible variations, workmanship and finish, marking, inspection and rejection, and methods of testing.

American Assn. of State Highway Officials, M87-42. Standard Specification for Reinforced Concrete Sewer Pipe. Gives scope, materials, design, curing, physical test requirements, crushing strength tests, sizes and permissible variations, workmanship and finish, markings, inspection and rejection, and methods of testing.

American Public Works Assn. Sewers, J1-38; 1938. Includes requirements for concrete sewer pipe, plain and reinforced, for conveyance of sewage, industrial wastes, and storm water. Conforms to specifications of the American Society for Testing Materials.

American Public Works Assn. Sewers, J1-38; 1938. Specifications covering complete sewer project, including excavation, open cut and tunnels, concrete, masonry, pipe and pipe sewers, piling, manholes, brick, vitrified tile, precast concrete, structural steel, iron and steel castings, structural timber, Portland cement, aggregates, tables of dimensions of various classes of sewer pipe, etc., using tests for materials as applicable in accordance with A. S. T. M. methods.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Sewers and Drainage. Gives requirements for vitrified sewer pipe.

American Society for Testing Materials, C 14-41; 1941. Concrete Sewer Pipe. Covers nonreinforced concrete pipe intended to be used for the conveyance of sewage, industrial wastes, and storm water. Class, basis of acceptance, concrete, cement, aggregates; mixture, crushing strength, and absorption; hydrostatic test, test specimens, measurement and observation of specimens, crushing strength tests, apparatus and application of load, three-edge-bearing method, sand-bearing method, absorption test, hydrostatic test, acceptance or rejection, sizes and tolerances, workmanship and finish, marking, inspection, and rejection.

American Society for Testing Materials, C 75-41; 1941. Reinforced Concrete Sewer Pipe. Covers reinforced concrete pipe intended to be used for the conveyance of sewage, industrial wastes, and storm water. Class, basis of acceptance, aggregates, mixture, minimum and alternate designs, placing reinforcements, longitudinals, laps, welds, and spacing; joints and joint reinforcement; physical, crushing strength, and absorption test requirements and apparatus; sizes and permissible variations; workmanship and finish; marking and inspection and rejection.

Clay Products Assn. Tentative Standards for Vitrified Clay Products, 1937. Includes specifications for laying of vitrified salt-glazed clay sewer pipe; requirements for excavation, shoring, foundations, pipe laying, sulfur-silica joints, table of amounts of jute and compound necessary, hot-poured bituminous joints, and backfilling.

Clay Products Assn. Tentative Standards for Vitrified Clay Products, 1937. Includes vitrified salt-glazed sewer pipe and fittings with tables of weights and standard dimensions. Conforms to A. S. T. M. specifications for all pipe, Y's, and T's.

Clay Sewer Pipe Assn., Inc. Handbook Vitrified Clay Sewer Pipe and Kindred Clay Products, 1942. Includes dimensions and weights of salt-glazed vitrified clay sewer pipe and fittings, half traps, traps, grease traps, meter boxes, septic tanks, and liner plates.

U. S. Gov., Federal Specification SS-P-371; 1937. Pipe; Concrete, Non-Pressure, Non-Reinforced, and Reinforced. Covers two types—(I) nonreinforced of bell and spigot pattern and (II) reinforced. Gives requirements for dimensions, strength, and design; methods of sampling, inspection, and tests; and requirements for packing and marking.

References.—Definitions, methods of testing, methods of laying pipe, *see* 518.60; sand, gravel, broken stone, slag, *see* 512; cement, concrete and mortars, *see* 516.1, 516.3; brick for sewers, *see* 534.11; brick masonry, *see* 518.83; vitrified clay lining plates, *see* 534.29; reinforcement steel, *see* 605.25; clay drain tile, *see* 534.21; vitrified clay pipe; *see* 531.5; concrete drain pipe, *see* 518.62; cast iron sewer pipe, *see* 607.11.

518.68 Dams and Flood Control

Portland Cement Assn. Concrete Structures for Flood Control—Soil and Water Conservation, 1937. Includes check dams, small-gully dams, medium and large-gully check dams or debris dams, gully-head plugs, drop inlets for culverts, and water storage and diversion structures. Also suggestions for channel lining, revetment, contraction works, channel enclosure, and flood walls.

518.7 RESERVOIRS, TANKS, POOLS, ETC.

518.70 General Items

American Society of Mechanical Engineers. Hydraulic Structures, 1937. Covers the functional design and detailed analysis of virtually all types of hydraulic structures. Deals with meteorology, hydrology, and hydraulics, soils and soil mechanics, and important building materials of hydraulic structures as to their bearing on other subjects in this book which include general subject of water supply, sewage, dams, outlet works and canal intake works, hydroelectric plants, reclamation, river and waterway engineering.

518.71 Fuel Storage Tanks

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Concrete Fuel Oil Tanks. Covers general requirements, design, and construction of concrete fuel oil storage tanks.

References.—Sand, gravel, broken stone, slag, *see* 512; cement, concrete and mortars, *see* 516.1, 516.3; reinforcing steel, *see* 605.25; steel tanks, *see* 605.23; other tanks, *see* 956.2.

518.72 Viaducts

References.—Sand, gravel, broken stone, slag, *see* 512; cement, concrete and mortars, *see* 516.1, 516.3; reinforcing steel, *see* 605.25.

518.73 Swimming Pools

American Public Health Assn. Recommended Practice for Design, Equipment, and Operation of Swimming Pools and Other Public Bathing Places, 1942. Covers classification of bathing places and general principles of bathing place sanitation; swimming pools including location and layout of pools, design and construction features, proportioning pool area to expected load, inlets and outlets, overflow gutters, steps, ladders and step holes, runways or sidewalks, visitors' galleries, dressing rooms, showers, toilets, lavatories, lighting, ventilation, heating, recirculation system, proportioning the water interchange for recirculation and flowing-through pools, filtration, disinfection, diving towers, spring boards and floats, safety precautions at swimming pools; suits, towels and caps; supervision of bathers, personal regulations, chemical and physical quality of swimming pool water, bacterial quality of swimming pool waters, cleaning pool, bathing load limits, and operating control; and outdoor bathing places including definition, sources of pollution, flowing-through bathing pools along small streams, disinfection of small flowing-through bathing pools, disinfection of large bodies of water, collection of samples from outdoor bathing places, bacteriological classification of bathing waters, relative classification of bathing areas recommended, sanitary appurtenances at outdoor bathing places, and safety precautions at outdoor bathing places.

National Collegiate Athletic Assn. The Official Swimming Guide With Official Rules for Swimming, Fancy Diving, and Water Polo, SW45. Includes recommended dimensions for pools for championship meets.

Tile Manufacturers' Assn. Swimming Pool Information, K-301; 1939. Includes indoor and outdoor pools with tilework specification and details; recommendations of the Amateur Athletic Union, National Collegiate Athletic Assn. and the Y.M.C.A. as to sizes, design and general details; requirements for competitive pools, locker room space, locating of pools, finish and decoration, pool markings, gutters, ladders, walkways, drains, starting grips, underwater lighting and observation window, galleries, cleaning of tile, and detailed specification for tile work.

References.—Sand, gravel, broken stone, slag, *see* 512; cement, concrete and mortars, *see* 516.1, 516.3; reinforcing steel, *see* 605.25; glazed tile for tiling, *see* 534.25.

518.74 Watering Troughs

518.75 Reservoirs

518.76 Spillways

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Embankment Spillways.

518.77 Cofferdams

518.8 MASONRY

518.80 General Items

National Concrete Masonry Assn. Facts About Concrete Masonry With Construction Details and Suggested Specifications, Eighth Edition, 1941. Covers facts about concrete masonry, strength and stability, comparative wall strengths, concrete masonry as fire retardant, heat transmission, sound-absorbing value, sound transmission, economy, water tight walls, cracks in masonry walls, painting, concrete ashlar walls, building codes, construction details, concrete brick walls, and suggested specifications for concrete footings and concrete masonry walls.

Structural Clay Products Institute. Cavity Brick Wall Construction, 1941. Specifications for Cavity Brick Wall Construction. Gives masonry units and mortars, metal ties, drainage, flashings and dampproof courses, and insulation.

Structural Clay Products Institute. Clay Masonry Graphics, undated. This series includes 48 graphic sheets showing various types of brick, tile, and brick and tile masonry construction including walls, floors, window details, termite barriers, walks and terraces, reinforced brick slabs, typical segmental arches, tapered units, common types of brick arches, typical structural clay tile arches, fireplaces, outdoor barbecue grill, and surface insulated and internally insulated masonry walls.

Structural Clay Products Institute. Mason's Handy Guide. Gives mortar recommendations, mortar proportions, weights of materials, and tables for estimating number of bricks, cubic feet of mortar, number of hollow wall tile, and quantities of lump quicklime, pulverized quicklime, and hydrated lime required.

Structural Clay Products Institute. Plans for Approved Farm Buildings of Brick and Tile, 1943. Gives drawings for construction of dairy barns, hog houses, vegetable storage cellar, and poultry house.

Structural Clay Products Institute. The Heart of the Home With Designs and Construction Details for Indoor and Outdoor Fireplaces, 1939. Gives photographs of various styles of indoor and outdoor fireplaces; essentials of correct fireplace construction including smoke shelf, damper, smoke chamber, separate flue, hearth, rear wall, and flue lining; table of fireplace dimensions, methods of construction; essentials of outdoor fireplace construction including hearth, grid, firebox, and chimney; and high efficiency heating fireplaces.

Structural Clay Products Institute. Watertightness and Transverse Strength of Masonry Walls, 1939. From address delivered at annual meeting of Structural Clay Products Industry by Chief of Masonry Section, National Bureau of Standards. Gives introduction, water permeability of masonry walls, transverse strength of masonry walls, application of results, and conclusion.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, sponsor. American Standard Assn., A41.1-1944. Masonry. Covers general, materials, allowable stresses in masonry, lateral support, solid masonry walls, walls of structural clay tile or hollow concrete masonry units, solid walls of plain concrete, stone walls, cavity walls and hollow walls of solid units, veneered walls, faced walls, foundation walls, piers, structural glass block, parapet walls, partitions, miscellaneous masonry requirements, existing walls, erection, and appendix.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS5; 1938. Structural Properties of Six Masonry Wall Constructions. Specimens were built representing six masonry wall constructions as follows: High-strength brick, cement mortar, excellent workmanship; medium-strength brick, cement-lime mortar, commercial workmanship; medium-strength brick, cement-lime mortar, excellent workmanship; structural clay tile on end, cement-lime mortar, excellent workmanship; structural clay tile on side, cement-lime mortar, excellent workmanship; and stone-concrete block, cement-lime mortar, excellent workmanship. The specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. For most of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load up to the maximum load, except for concentrated loads, for which the set only was determined. The results are presented graphically and in a table.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS7; 1938. Water Permeability of Masonry Walls. Walls of brick, structural clay tile, and hollow concrete unit masonry were tested under conditions resembling exposures to wind and rain and their resistance to the penetration of water determined. Five kinds of workmanship (methods of filling joints), three kinds of brick, six kinds of structural clay tile, two kinds of hollow concrete units, and six different mortars were used in the construction of the walls. The effectiveness of several methods of "waterproofing" were compared by retesting some of the walls after they had been treated.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS55; 1940. Effects of Wetting and Drying on the Permeability of Masonry Walls. Since the volume changes resulting from the wetting and drying of masonry units and mortars are unequal, changes in the moisture content of a masonry wall may produce differential volume changes between the units and the mortar, resulting in the formation or enlargement of cracks in the joints. The effects of changes in the moisture content of 8 small masonry walls were studied by measuring the permeability of the walls during each of about 12 cycles of wetting and drying. Five of the walls were of all-brick construction, one was a stucco-faced wall, and two were faced with brick and backed with hollow units.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS76; 1941. Effect of Outdoor Exposure on the Water Permeability of Masonry Walls. The water permeabilities of about 100 small masonry-wall specimens were measured before and after exposing them to the weather at Washington, D. C., for a maximum period of three years. Some of the more permeable walls had been waterproofed before exposure and the durability of the waterproofing treatments, as well as the structural appearance or condition of the walls, was also determined.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS82; 1942. Water Permeability of Walls Built of Masonry Units. Describes the results obtained from tests on a group of 140 walls, represented by 14 kinds of workmanship, 39 kinds of units, 10 kinds of mortars.

518.81 Dry Rubble Masonry

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for dry rubble masonry—requirements for general quality, size, and shape of stone; headers; shaping and laying stone; copings, bridge seats and backwalls; and measurement and payment.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Dry Rubble Masonry.

References.—Definitions, methods of sampling and of testing, *see* 510; masonry stone, *see* 511.1, 511.2, 511.4, 511.9; riprap, *see* 511.72.

518.82 Cement Rubble Masonry

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for mortar rubble masonry—requirements for general quality and size of stone; headers; shaping stone; laying stone; copings; bridge seats and backwalls; arches; pointing, and measurement and payment.

American Public Works Assn. Sewers, J1-38; 1938. Includes specifications for rubble masonry consisting of roughly squared or dressed stone laid in cement mortar; requirements for mortar, headers, shaping of stone, laying of stone, pointing, and basis of payments, using tests in accordance with A.S.T.M. methods for materials.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Cement Rubble Masonry.

References.—Definitions, methods of sampling and of testing stone, *see* 510; masonry stone, *see* 511.1, 511.2, 511.4, 511.9; cement, concrete and mortars, *see* 516.1, 516.3; building construction, *see* 518.50, 518.51; stone masonry, *see* 518.89.

518.83 Brick Masonry

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for brick masonry—requirements for brick (to conform to American Society for Testing Materials Specification C-62); construction methods; copings, bridge seats and backwalls; and measurement and payment.

American Public Works Assn. Sewers, J1-38; 1938. Includes requirements for brick masonry; for sewer brick in three grades, sizes and properties in accordance with A.S.T.M. specification C67, brick masonry for sewers and storm-water conduits, form, line and grade, laying courses, finish, construction of inverts and arches, protection, manholes, wellholes and inlets, using A.S.T.M. methods of test for material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS23; 1939. Structural Properties of a Brick Cavity-Wall Construction, sponsored by the Brick Manufacturers Assn. of New York, Inc. The Brick Manufacturers Assn. of New York, Inc., submitted 15 specimens representing a brick cavity-wall construction. The specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. The compressive loads were applied to the facing and backing of three specimens and to the backing only of three other specimens. For each of the loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented graphically and in a table.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS24; 1939. Structural Properties of a Reinforced-Brick Wall Construction and a Brick-Tile Cavity-Wall Construction, sponsored by the Structural Clay Products Institute. The Structural Clay Products Institute submitted 9 specimens representing a reinforced-brick wall construction and 18 specimens representing a brick-tile cavity-wall construction. The reinforced-brick wall specimens were subjected to compressive, transverse, concentrated, and impact loads. The brick-tile cavity-wall specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. The transverse, concentrated, and impact loads were applied to both faces of the brick-tile cavity-wall specimens. For each of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented graphically and in tables.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS32; 1939. Structural Properties of Two Brick-Concrete-Block Wall Constructions and a Concrete-Block Wall Construction, sponsored by the National Concrete Masonry Assn. The National Concrete Masonry Assn. submitted 48 specimens representing 3 wall constructions, 2 of which consisted of brick facing and concrete-block backing, the other of concrete blocks only. The specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. The transverse, concentrated, and impact loads were applied to both faces of the brick-concrete-block wall constructions. For each of the loads three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented in graphs and in tables.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Brick Masonry.

References.—Sand lime brick, *see* 513; clay brick, *see* 534.11; fire clay brick, *see* 534.12; concrete brick, *see* 516.4; cement, concrete and mortars, *see* 516.1, 516.3; walls and partitions of buildings, *see* 518.53; building construction, *see* 518.50, 518.51.

518.84 Masonry Arches

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Stone Masonry. Gives requirements for arch masonry—ashlar stone and block rubble.

References.—Definitions, methods of sampling and of testing stone, *see* 510; masonry stone, *see* 511.1, 511.2, 511.4, 511.9; cement, concrete and mortars, *see* 516.1, 516.3; bridge arches, *see* 518.46, 518.89; building construction, *see* 518.50, 518.51.

518.85 Monuments

U.S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Concrete Maintenance Marker Posts.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Right-of-Way Monuments.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Timber Culvert Markers.

518.89 Miscellaneous Specifications for Masonry

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for ashlar masonry—requirements for general quality, size, surface finishes (five types), and dressing of stone; stretchers; headers; cores and backing; mixing mortar; laying stone (face stone), stone backing and cores, and concrete cores and backing; leveling courses; resetting; dowels and cramps; copings; arches; pointing; and measurement and payment.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Stone Masonry and Cut Stone Work. Gives description of stone; and requirements for carving, cutting and finishing, Lewis holes, mortar, anchor and dowels, setting, protection, cleaning, and pointing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Stone Masonry. Gives requirements for mortar; laying; pointing; ashlar; block rubble; and arch, culvert, and dry masonry.

Indiana Limestone Institute. Cut Stone Masonry, 1940. Covers oolitic limestone wholly fabricated in mill and specifications for fabrication; description of stone, grades and finishes, samples, shop drawings, cutting, back-checking and fitting to structural frame, models, inscriptions, cornerstone, shipping; and stone setting, including delivery and storage, scaffolding, mortar, anchors, back-painting, parging, pointing, and protection; random ashlar, staining and efflorescence, waterproofing compounds; and cleaning, using steam, acids, scrubbing, or sand blast.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS21; 1939. Structural Properties of a Concrete-Block Cavity-Wall Construction, sponsored by the National Concrete Masonry Assn. The National Concrete Masonry Assn. submitted 12 specimens representing a concrete-block cavity-wall construction. The specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. For each of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented graphically and in a table.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS23; 1939. Structural Properties of a Brick Cavity-Wall Construction, sponsored by the Brick Manufacturers Assn. of New York, Inc. The Brick Manufacturers Assn. of New York, Inc. submitted 15 specimens representing a brick cavity-wall construction. The specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. The compressive loads were applied to the facing and backing of three specimens and to the backing only of three other specimens. For each of the loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented graphically and in a table.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS24; 1939. Structural Properties of a Reinforced-Brick Wall Construction and a Brick-Tile Cavity-Wall Construction, sponsored by the Structural Clay Products Institute. The Structural Clay Products Institute submitted 9 specimens representing a reinforced-brick wall construction and 18 specimens representing a brick-tile cavity-wall construction. The reinforced-brick wall specimens were subjected to compressive, transverse, concentrated, and impact loads. The brick-tile cavity-wall specimens were subjected to compressive, transverse, concentrated, impact, and racking loads. The transverse, concentrated, and impact loads were applied to both faces of the brick-tile cavity-wall specimens. For each of these loads, three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented graphically and in tables.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS32; 1939. Structural Properties of Two Brick-Concrete-Block Wall Constructions and a Concrete-Block Wall Construction, sponsored by the National Concrete Masonry Assn. The National Concrete Masonry Assn. submitted 48 specimens representing 3 wall constructions, 2 of which consisted of brick facing and concrete-block backing, the other of concrete blocks only. The specimens were subjected to compressive, transverse, concentrated, impact, and rackin loads. The transverse, concentrated, and impact loads were applied to both faces of the brick-concrete-block wall constructions. For each of the loads three like specimens were tested. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The results are presented in graphs and in tables.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS41; 1940. Effect of Heating and Cooling on the Permeability of Masonry Walls. Permeability tests were made on 11 small masonry wall specimens before and after exposing them to a number of cycles of heating and cooling. Seven of the specimens were 12-in. brick walls, two were of clay tile with stucco facings, and two were brick walls with hollow-unit backings.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes class A and class B stone masonry and stone masonry in parapets.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Foundation Masonry.

References.—Definitions, methods of sampling and of testing stone, *see* 510; masonry stone, *see* 511.1, 511.2, 511.4, 511.9; sand, gravel, broken stone, slag, *see* 512; cement, concrete and mortars, *see* 516.1, 516.3; cast stone, concrete blocks, *see* 516.4.

518.9 MISCELLANEOUS CONSTRUCTION WORK

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for riprap, concrete slab riprap, and concrete cribbing—requirements for general quality and size of materials, dry riprap for slopes (two classes), mortared riprap for slopes, grouted riprap for slopes, concrete riprap in bags, concrete slab riprap (placing, measurement, and payment), and concrete cribbing (crib members, drift bolt casings, construction, and measurement and payment).

American Petroleum Institute, Division of Production. Standard No.4; 1944. Specification for Standard Rigs, Derricks, and Accessory Equipment. This specification covers dimensional and strength requirements of steel and wood derricks, rig and derrick parts, derrick substructures, pumper structures, bolts, and capacity ratings for roller bearings. Covers material, workmanship and finish, steel derrick dimensions, steel derrick strength or capacity requirements, derrick substructures, standard rig parts, capacity rating of pumper structures, allowable unit stresses, specification for bolts, rating of radial bearings, rating of flat thrust bearings, nailed wood derrick dimensions, nailed wood derrick strength or capacity requirements, marking, inspection and rejection, and appendices.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Ballast Sections for Single and Multiple Track—Tangent and Curves.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Lining Railway Tunnels With Brick. Gives requirements for materials and design.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Lining Railway Tunnels With Metal Liner Plates and Shotcrete. Gives requirements for metal lining, design, and shotcrete.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Lining Railway Tunnels With Plain Concrete. Gives requirements for design, concrete, forms, placing concrete, and construction and expansion joints.

American Society for Testing Materials, C 176-44; 1944. Fireclay Plastic Refractories for Boiler and Incinerator Service. Covers scope, high heat duty plastic refractories required for average service conditions, super duty plastic refractories for use in the zone of highest temperature and where severe spalling or slagging occurs, retests, and methods of testing.

Assn. of American Railroads, Telegraph and Telephone Section, 1-C-1; 1940. Communication Underground Conduit Construction. Includes requirements for location and clearances, materials such as couplings, risers, U guard, manholes and covers, cable racks and hooks, concrete work, trenching, grading, creosoted wood duct, clay tile, iron and steel pipe, fiber duct, laterals, excavating, manhole dimensions, drainage, floors, walls and roofs, etc.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume 1. Structural Details, 1938. For concrete foundations for tanks and towers, requirements as to concrete mixture, construction of piers, anchorage requirements, permissible bearing pressures, details of concrete design according to A.S.T.M. specifications.

National Board of Fire Underwriters. Regulations for Incinerators, No.82; 1938. Requirements for three types of stationary incinerators and portable domestic incinerators. Form of combustion chamber; smoke flue, service openings, fuel-fired types, rubbish and waste types, installation, and operation.

U. S. Gov., Federal Housing Administration. Minimum Construction Requirements. These requirements provide a Minimum Standard of Construction and shall apply to all new construction on which the mortgage is insured by the Federal Housing Administration. They are considered necessary to produce a well-constructed dwelling which will serve as sound security for a long-term mortgage loan. Since these requirements are essentially minimum, they are not to be built down to but form a basis from which to build up. Copies are available in the F.H.A. insuring offices throughout the U. S. Include requirements for excavation, masonry, adobe construction, structural steel and iron, lumber, wood framing, termite prevention, roof coverings, sheet metal, lathing, plastering, stucco, painting, plumbing, heating, electrical work, etc., according to geographical location and local building code requirements.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes concrete cribbing and timber and log cribbing.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Derrick-Placed Rock Retaining Wall.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Dimensioned Masonry.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Stone Masonry Facing for Concrete.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 5Yb; 1935. Radial Brick and Concrete Chimneys.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification E-9Ye; 1943. Electrical Apparatus, Distributing Systems, and Wiring (Emergency Edition). Includes requirements for underground conduit.

References.—Sand, gravel, broken stone, slag, *see* 512; cement, concrete and mortars, *see* 516.1, 516.3; portable gas incinerator, *see* 997.2.

520-529 GLASS AND GLASS PRODUCTS

520. GENERAL ITEMS

American Ceramic Society. Journal of A.C.S. for June 1928. Tentative Methods. Analysis of Glass, 1926. Preparation and fusion of sample, method for determination of silica, iron, and alumina, lime, magnesia, and alkalies.

American Society for Testing Materials, C 146-43; 1943. Methods of Chemical Analysis of Glass Sand. For use in referee analysis primarily for glass sand containing not less than 98 percent silica. Covers special solutions required, preparation of sample, loss on ignition, silicon dioxide, ferric oxide, and determination of other oxides.

American Society for Testing Materials, C 147-43; 1943. Method of Hydrostatic Pressure Test on Glass Containers. For determination of breaking strength of narrow-mouth glass containers and serviceability of pressure containers. Covers apparatus, sampling, procedure, and report.

American Society for Testing Materials, C 148-43; 1943. Method of Polariscopic Examination of Glass Containers. For determining the relative annealing stress in glass containers by comparison with reference standards. Covers apparatus, sampling, procedure, and report.

American Society for Testing Materials, C 149-43; 1943. Method of Thermal Shock Test on Glass Containers. For determining relative resistance of commercial glass containers (bottles and jars) to temperature changes (thermal shock) in service such as washing, pasteurization, or "Hot-Pack" processes, etc. Gives requirements for apparatus, sampling, procedure, and report.

American Society for Testing Materials, C 158-43; 1943. Method of Flexure Testing of Glass (Determination of Modulus of Rupture). In practice the modulus of rupture is usually taken as the stress at which the specimen breaks in the flexure tests. Covers apparatus, test specimen of rods, test specimens of flat glass, procedure, calculation, and report.

American Society for Testing Materials, C 162-41T; 1941. Tentative Definition of the Term "Glass."

American Society for Testing Materials, C 169-43; 1943. Methods of Chemical Analysis of Soda-Lime Glass. Covers procedures for use in the referee analysis and in the routine analysis of soda-lime glasses. Covers reagents, filter papers, preparation of sample for analysis, and probable accuracy of results. Also gives procedures for referee analysis and for routine analysis.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Glass, Low Boron, Sample 92; Glass, High Boron, Sample 93; Glass, Lead-Barium, Sample 89; Glass, Opal, Sample 91; Glass, Soda-Lime, Sample 80; Glass, Sand, Sample 81; and Glass, Soda-Lime (B_2O_3BaO), Sample 128. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

521. FLAT GLASS

521.0 GENERAL ITEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Painting and Glazing. Gives requirements for glazing windows, doors, transoms, skylights, and marquises.

Society of Automotive Engineers. 1944 Handbook—SAE Recommended Practice for Glazing Glass. Thickness of glass for vehicles normally operating on land. To comply with American Standard Z26.1-1938.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Joint sponsor with National Bureau of Casualty and Surety Underwriters. American Standards Assn., Z26.1-1938. Safety Code for Safety Glass for Glazing Motor Vehicles Operating on Land Highways.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP709; 1934. Opacity Standards. Describes tests of solid-opal glass, ground to nearly uniform thickness, one face fire-polished, the other fine-ground; and flashed-opal glass, the flashed face fire-polished, the other face fine-ground; and outlines the method of checking an opacimeter by its use.

521.1 PLATE GLASS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Glass; Window and Plate. Covers definition, constants, solubility, derivation, uses, types, grades and sizes, packing, and substitutes.

U. S. Gov., Federal Specification DD-G-451; 1931. Amendment 1; 1944. Glass; Flat for Glazing Purposes. Includes plate glass. Covers polished plate glass, second silvering quality and glazing quality; and ornamental, figured plate. Gives definitions, general requirements, sizes and thickness, tolerances in thickness, tolerances in dimensions, grades, and details for each type; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-357; 1944. Glass; Selected Plate, Photographic.

References.— Methods of analysis, standard samples of glass, *see* 520; sand for glass, *see* 512.12; lime for glass, *see* 517.2; limestone for glass, *see* 511.2.

521.2 CLEAR WINDOW GLASS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Glass; Window and Plate. Covers definition, constants, solubility, derivation, uses, types, grades and sizes, packing, and substitutes.

U. S. Gov., Federal Specification DD-G-451; 1931. Amendment 1; 1944. Glass; Flat for Glazing Purposes. Includes clear window glass. Covers single strength, quality A and B; double strength, quality A and B; and heavy sheet, glazing quality and factory-run quality. Gives definitions, general requirements, requirements for all thicknesses, sizes obtainable, tolerances in thickness, flatness, glazing, dimensions, and details for each type; methods of sampling, inspection, and test; and packaging, packing, and marking.

References.—Methods of analysis, standard samples of glass. *see* 520; standard sizes, *see* 521.0; sand, lime, and limestone for glass, *see* 512.12, 517.2, 511.2.

521.3 WIRE GLASS

U. S. Gov., Federal Specification DD-G-451; 1931. Amendment 1; 1944. Glass; Flat for Glazing Purposes. Includes wire glass. Covers polished wire; polished, one side; figured; corrugated; and colored. Gives definition, general requirements, quality, tolerance for thickness, dimensions, and details for each type; methods of sampling, inspection, and test; and packaging, packing, and marking.

References.— Methods of analysis, standard samples of glass, *see* 520; standard sizes, *see* 521.0; sand, lime, limestone for glass, *see* 512.12, 517.2, 511.2.

521.4 ROLLED FIGURED SHEET GLASS

U. S. Gov., Federal Specification DD-G-451; 1931. Amendment 1; 1944. Glass; Flat for Glazing Purposes. Includes rolled figured sheet. Covers figured sheet, large variety of patterns; and colored figured sheet. Gives definition, general requirements, quality, tolerance for thickness, dimensions, and details; methods of sampling, inspection, and test; and packaging, packing, and marking.

References.— Methods of analysis, standard samples of glass, *see* 520; standard sizes, *see* 521.0; sand, lime, limestone for glass, *see* 512.12, 517.2, 511.2.

521.5 PRISM GLASS

U. S. Gov., Federal Specification DD-G-451; 1931. Amendment 1; 1944. Glass; Flat for Glazing Purposes. Includes prism glass. Covers pressed tile, rolled sheet, and rolled and pressed sheet. Gives definition, general requirements, quality, tolerance for thickness, dimensions, and details for each type; methods of sampling, inspection, and test; and packaging, packing, and marking.

References.— Methods of analysis, standard samples of glass, *see* 520; sand, lime, limestone for glass, *see* 515.12, 517.2, 511.2.

521.6 SPECIAL QUALITY GLASS

U. S. Gov., Army Air Forces. Specification 12031 (1); 1943. Glass; Bullet Resistant.

U. S. Gov., Army-Navy Aeronautical Specification AN-DD-G-551-1; 1940. Glass; Laminated.

U. S. Gov., Federal Specification DD-G-451; 1931. Amendment 1; 1944. Glass; Flat for Glazing Purposes. Includes glass for absorbing and intercepting ultra-violet and infra-red rays. May be made as rolled figured sheet or wire glass in flat or corrugated sheets. Gives requirements for the exclusion of ultra-violet rays and infra-red rays; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Federal Specification DD-G-476; 1932. Glass; Flat, Glazing (for) Transmitting Not Less Than 25 Percent of. Ultra-Violet Radiation at Wave Length 302 Millimicrons. Covers one type. Gives detail requirements; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 12G6c; 1944. Glasses; Heat-Treated, Circular.

U. S. Gov., Navy Dept. Specification 12G8; 1940. Glasses; Heat-Treated, Disk Type (Clear View Screens).

U. S. Gov., Navy Dept. Specification 59G3; 1940. Glass; Heat-Treated, Glazing, Rectangular (for Bridge Windows).

U. S. Gov., Navy Dept. Specification 60G1a; 1938. Glasses; Port-Light, Evaporator.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Glass; Bulletproof.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 81-11D; 1942. Glass; Laminated.

References.— Methods of analysis, standard samples of glass, *see* 520; sand, lime, limestone for glass, *see* 512.12, 517.2, 511.2.

521.7 SIDEWALK AND SKYLIGHT GLASS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R49-26; 1926. Sidewalk, Floor, and Roof Lights. This recommendation establishes simplified sizes, shapes, and styles for sidewalk lights of round and square glass, and floor and roof lights of square glass.

References.— Methods of analysis, standard samples of glass, *see* 520; sand, lime, limestone for glass, *see* 512.12, 517.2, 511.2.

521.8 GLASS PARTITIONS AND INCLOSURES

References.— Methods of analysis, standard samples of glass. *see* 520; sand, lime, limestone for glass, *see* 512.12, 517.2, 511.2.

521.9 MISCELLANEOUS FLAT GLASS

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes recommendations for sizes, shape, and height of glass spotting boards.

U. S. Gov., Federal Specification DD-G-451; 1931. Amendment 1; 1944. Glass; Flat for Glazing Purposes. Includes processed glass. Covers chipped, No.1 processed, and No.2 processed; and ground, acid ground, and sand blasted. Gives definitions and general requirements; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Federal Specification DD-T-396; 1944. Tiles; Pill, Glass (Pharmaceutical). Covers one type, grade, and class. Gives requirements for material, workmanship, description, and etching; methods of sampling and inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes requirements for clear plate glass shelf supported by two bent metal brackets. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

References.— Methods of analysis, standard samples of glass, *see* 520; sand, lime, limestone for glass, *see* 512.12, 517.2, 511.2.

522. GLASS CONTAINERS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R91-32; 1932. Glass Containers for Preserves, Jellies, and Apple Butter. This recommendation establishes a list of stock sizes and capacities of glass containers for preserves, jellies, and apple butter. Initiated by National Preservers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R156-41; 1941. Extracted-Honey Packages. This recommendation establishes a schedule of sizes of containers for use in marketing stock packages of extracted honey. The recommended sizes are 2, 5, and 8 oz. and 1, 1 1/2, 2, 2 1/2, 3, 5, 10, and 60 lbs. Sponsored by American Honey Producers League and American Honey Institute.

References.—Bottles, carboys, flasks, jars, and demijohns, *see* 955.

523. TABLE GLASSWARE

523.0 GENERAL ITEMS

523.1 VINEGAR BOTTLES

U. S. Gov., Federal Specification DD-T-101a; 1938. Tableware; Glass. Covers the type of glassware known as blown or pressed ware, and includes six classes—(A) tumblers, (B) vinegar bottles, (C) sirup pitchers, (D) salt shakers, (E) pepper shakers, and (F) special items. Gives requirements for material, glass, design, dimensions, capacity, weight, metal parts, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-DD-T-101a; 1942, changes requirements for design, tolerances, tests, and admits plastic in lieu of metal.

References.—Methods of analysis, standard samples of glass, *see* 520; pressed ware (bottles), *see* 523.9.

523.2 PITCHERS

U. S. Gov., Federal Specification DD-T-101a; 1938. Tableware; Glass. Covers the type of glassware known as blown or pressed ware, and includes six classes—(A) tumblers, (B) vinegar bottles, (C) sirup pitchers, (D) salt shakers, (E) pepper shakers, and (F) special items. Gives requirements for material, glass, design, dimensions, capacity, weight, metal parts, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-DD-T-101a; 1942, changed requirements for design, tolerances, tests, and admits plastic in lieu of metal.

References.—Methods of analysis, standard samples of glass, *see* 520; pressed ware (pitchers), *see* 523.9.

523.3 GLASS SALT SHAKERS

U. S. Gov., Federal Specification DD-T-101a; 1938. Tableware; Glass. Covers the type of glassware known as blown or pressed ware, and includes six classes—(A) tumblers, (B) vinegar bottles, (C) sirup pitchers, (D) salt shakers, (E) pepper shakers, and (F) special items. Gives requirements for material, glass, design, dimensions, capacity, weight, metal parts, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-DD-T-101a; 1942, changed requirements for design, tolerances, tests, and admits plastic in lieu of metal.

U. S. Gov., Veterans Administration. Specification VA-G-53j; 1941. Sugar Shakers (for Granulated Sugar).

References.—Methods of analysis, standard samples of glass, *see* 520; pressed ware (shakers), *see* 523.9

523.4 TUMBLERS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R91-32; 1932. Glass Containers for Preserves, Jellies, and Apple Butter. This recommendation establishes a list of stock sizes and capacities of glass containers for preserves, jellies, and apple butter. Initiated by National Preservers Assn.

U. S. Gov., Federal Specification DD-T-101a; 1938. Tableware; Glass. Covers the type of glassware known as blown or pressed ware, and includes six classes—(A) tumblers, (B) vinegar bottles, (C) sirup pitchers, (D) salt shakers, (E) pepper shakers, and (F) special items. Gives requirements for material, glass, design, dimensions, capacity, weight, metal parts, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-DD-T-101a; 1942, changed requirements for design, tolerances, tests, and admits plastic in lieu of metal.

U. S. Gov., Navy Dept. Specification 63T10; 1944. Tumblers; Glass (Thin-Blown).

U. S. Gov., Veterans Administration. Specification VA-G-45b; 1935. Tumblers; Lime-Flint Glass.

References.—Methods of analysis, standard samples of glass, *see* 520; pressed ware (tumblers), *see* 523.9

523.9 MISCELLANEOUS TABLE GLASSWARE

U. S. Gov., Navy Dept. Specification 63T9d; 1944. Tableware; Glass, Officers' Mess-Gear.

524. LIGHTING GLOBES AND SHADES

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 59-39; 1939. Kerosene Hand Lantern Globes. Minimum values of luminous transmission and limits of chromacity for red, yellow, green, and blue colors used in railroad signaling. Values given obtained from Colorimetry Section of National Bureau of Standards, maximum deviation from standard limit glasses, with tables and diagrams. Standard size, marking, calibrations by the National Bureau of Standards, hot water and chill tests.

American Society for Testing Materials, D 187-39; 1939. American Petroleum Institute Standard, 502-39. American Standards Assn., Z11. 17-1939. Method of Test for Burning Quality of Kerosine Oils. For burning quality of ordinary kerosine used for illuminating purposes, description of standard brass

Saybolt test lamp, Miller No. 2 burner, MacBeth-Evans No. 514 pearl top chimney, detailed dimensions of burner, wick, balance and sight gage, and test procedure.

American Society for Testing Materials, D 219-36; 1936. American Petroleum Institute Standard 503-36. American Standards Assn., Z11.19-1936. Method of Test for Burning Quality of Long-Time Burning Oil for Railway Use. For special kerosine oil used in railway semaphore signal lamps, includes standard semaphore lamp, dimensions of burner, gray round felt wick and chimney, sight gage, and test procedure.

American Society for Testing Materials, D 239-30; 1930. American Petroleum Institute Standard 504-30. American Standards Assn., Z11.18-1930. Method of Test for Burning Quality of Mineral Seal Oil. For burning quality of special illuminating oil known as mineral seal oil, 300 oil, or mineral colza oil, used in railway coach lamps. Using Dressel standard No. 520 side lamp; dimensions of font, burner, chimney, and wick; sight gage and outline of procedure.

Illuminating Engineering Society. Specifications for Shades for I.E.S. Portable Lamps, 1935. Applies to shades designed for incorporation in certified I.E.S. table and floor lamps. Includes requirements for effectiveness, construction, and proposed specifications for shades for I.E.S. portable lamps.

Illuminating Engineering Society. Testing Specifications for Lighting Equipment, Sections I and IV. Specification C-1-1940. Luminaires for General Lighting. Includes requirements for materials, diffuse enclosing and semi-indirect enclosing globes; direct, indirect, and semi-direct luminaires; selection, physical measurements, output, candlepower distribution, brightness, and lamp neck cutoff ratio.

U. S. Gov., Army Air Forces. Specification 32021-A (1); 1943. Globe; Field Outline Lamp.

U. S. Gov., Federal Specification DD-C-311; 1935. Amendment 1; 1944. Chimneys and Globes, Lamp and Lantern; Glass. Covers two types—(II) lantern globes for hand lanterns, railway signal lanterns, and similar uses, clear and colored and (II) lamp chimneys for interior lighting. Gives requirements for material and workmanship, quality of glass, design. and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 17L5g; 1944. Lenses and Globes; Electric Light.

U. S. Gov., Navy Dept. Specification 31B2b; 1934. Chimneys; (Burners; Wicks;) Running-Light (Oil-Burning).

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Enclosing Glassware for Lighting Fixtures, 1941.

U. S. Gov., Treasury Dept., Procurement Div., No. 254. Globes; Lighting, Enclosing. Shall be of one grade, two types— (I) semi-direct and (II) semi-indirect. Gives requirements for material and workmanship, diameters, light output, surface brightness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 255E; 1941. Luminaires; Complete. Shall be of two types—(I) indirect, silver mirrored reflector, porcelain enamel reflector, and silvered bowl lamp reflector and (II) semi-indirect, bowl-type. Gives requirements for design, hangers, swivels, stem, wiring, sockets, metal parts of fixture, distribution, angle of cut off, finish, and surface brightness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.— Methods of analysis, standard samples of glass, *see* 520; electric lamps, *see* 716.1; electron tubes, *see* 718.62; oil lamps and lanterns, *see* 997.1.

525. LENSES

References.— Binoculars, telescopes and optical goods, *see* 914.

525.0 GENERAL ITEMS

525.1 LIGHTHOUSE LENSES

525.2 REFLECTORS

Illuminating Engineering Society. Testing Specifications for Lighting Equipment, Section III. Specifications for Testing Asymmetric Show-Window Reflectors. Includes instructions for selection of sample, physical measurements, output candlepower distribution, lumen distribution, and gives typical show-window example.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40740; 1944. Reflector; Reflex Taxi-Strip-Delineator.

References.— Glass reflectors for headlights and searchlights, *see* 716.2.

525.3 SIGNAL LAMP LENSES

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 69-40; 1941. Signal Glasses. Except for kerosene hand lantern globes, defines minimum values for luminous transmission and the limits of chromaticity for signal colors. Data obtained by the Colorimetry Section, National Bureau of Standards, maximum deviation from standard limit glasses for red, yellow, green, blue, purple, and white, with tables and diagrams. Roundels, lenses, discs, and slides for railroad signalling, quality of glass, marking, etc.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-2; 1943. Lens; 24-In. Double Beam.

U. S. Gov., Navy Dept. Specification 17L5g; 1944. Lenses and Globes; Electric Light.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-623A; 1931. Filter; Types MC-121 and MC-122, for Signal Lamps.

References.— Methods of analysis, standard samples of glass, *see* 520; testing of lenses, *see* 525.0; color definitions of traffic signal lenses, *see* 718.5.

525.4 AUTOMOBILE LAMP LENSES

References.— Methods of analysis, standard samples of glass, *see* 520.

525.5 PHOTOGRAPHIC LENSES

References.—*See* 911.6.

525.9 MISCELLANEOUS LENSES

U. S. Gov., Army-Navy Aeronautical Specification AN-C-70; 1942. Covers; Light-Transmitting (for Aeronautical Lights).

U. S. Gov., Army-Navy Aeronautical Specification AN-L-3a; 1942. Lens; 24-In. Drum Type Floodlight.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-101-19E; 1942. Lens; Laminated, 3-Ply.

526. CHEMICAL LABORATORY AND OTHER GLASSWARE

526.1 GLASS INSULATORS

American Society for Testing Materials, D 468-42; 1942. Methods of Testing Pin-Type, Lime-Glass Insulators. Covers glass insulators for primary and secondary power distribution to 10,000 volts to ground; requirements for sampling, structural defects, resistance to thermal shock, gaging of threads, mechanical strength, electrical tests, and details of thread standards for the power industry.

American Society for Testing Materials, D 550-44; 1944. Methods of Testing Glass Spool Insulators. For secondary power distribution. Sampling, routine tests, structural defects, gaging, report, record, and marking.

American Society for Testing Materials, D 730-43T; 1943. Tentative Specifications for Low and Medium Voltage Pin-Type Lime-Glass Insulators. Covers general requirements, material, definitions, insulator characteristics, marking, packing, manufacturers' production sampling and tests, purchasers' acceptance sampling and tests, inspection tests, mechanical tests, electrical tests, and method of testing.

American Society for Testing Materials, ES-41; 1944. Emergency Specifications for Communication and Signal Pin-Type Lime-Glass Insulators. Gives scope, material, thermal shock, electrical characteristics, dimensions and permissible variations, workmanship and finish, marking, packaging, and methods of testing.

American Standards Assn., C 75.8-1943. Glass Radio Insulators (American War Standard). Covers applicable specifications and drawings, classification, material and workmanship, general and detail requirements, methods of inspection and tests, packing, packaging, marking for shipment; requirements applicable to individual government departments, notes, and drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-33; 1930. Double-Petticoat Glass Insulators. Includes side groove and top groove line wire insulators of green or colorless transparent glass, dimensional diagrams and thread gage, and finish requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-34; 1930. Dead-Ending Glass Insulators. For transparent glass dead-ending insulators, requirements for material and finish, with dimensional drawing, and permissible variations.

Edison Electric Institute. Suggestions for Specifications for Low and Medium-Voltage Pin-Type Lime-Glass Insulators, TD-51; 1942. For insulators having a dry flashover of 85,000 volts or less. Gives requirements for material, definitions, insulator characteristics, marking, packing, manufacturer's production sampling and tests, purchaser's acceptance sampling, purchaser's acceptance tests, test procedure, and drawings showing dimensions and correction factors.

U. S. Gov., Joint Army-Navy Specification JAN-1-9; 1944. Insulators; Glass, Radio.

References.— Methods of analysis, standard samples of glass, *see* 520; porcelain insulators, *see* 532.22; thread gages for insulators, *see* 615.82.

526.2 CHEMICAL LABORATORY GLASSWARE

References.— Methods of analysis, standard samples of glass, *see* 520; surgical and medical instruments, *see* 915.2; burettes and pipettes, *see* 918.1; beakers, graduates, funnels, *see* 918.2; glass tubing and tubes, *see* 918.7; hydrometers, thermometers, *see* 919.4, 919.8; biological laboratory apparatus, *see* 918.8; laboratory flasks, *see* 918.9; bottles, jars, *see* 955.1, 955.4.

526.3 COVER GLASSES

American Hospital Assn., 43-13. Cover Glasses. Covers one type, one grade, and two classes.

U. S. Gov., Federal Specification DD-G-426; 1941. Glasses; Cover, (for) Microscopy. Covers two types—(I) for blood counting chambers, in two classes—(A) light and (B) heavy, and in one size—20 mm. by 26 mm.; and (II) for routine microscopy, in three classes—22 mm. by 22 mm., 22 mm. by 40 mm., and 25 mm. by 25 mm. Gives requirements for material, workmanship, sizes, and measurements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

526.4 GLASS TUBES AND TUBING

References.—Glass tubes and tubing, *see* 918.7.

526.6 WATER GAUGES

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Water Gauge and Lubricator Glasses, M-909-42; 1942. Reflex, tubular, and "bull's-eye" water gauge glasses, and "bull's-eye" lubricator gauge glasses. For use on locomotive and stationary boilers, requirements as to physical properties and tests, permissible variations, workmanship, wrapping, and labeling.

U. S. Gov., Federal Specification DD-G-491; 1939. Glasses; Gage, Flat (Plain and Reflex), (for Pressures 125 lbs. and Over). Covers two types—(I) plain and (II) reflex. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DD-G-496; 1939. Glasses; Gage, Reflex and Round, Tank (for Pressures Under 125 Lbs.). Covers two types—(I) round, (II) reflex, flat. Gives detail requirements; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DD-G-511; 1939. Glasses; Gage, Round, Boiler (for Pressures 125 Lbs. and Over). Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 13G1e; 1942. Glasses; Gage, Round (for Pressures up to 200 Lb.).

U. S. Gov., Navy Dept. Specification 13G2e; 1943. Glasses; Gage, Round and Flat, Reflex, Under 125 Lb. Pressure.

U. S. Gov., Navy Dept. Specification 13G3g; 1944. Glasses; Gage, Flat, Plain and Reflex, Over 125 Lb. Pressure.

References.—Methods of analysis, standard samples of glass, *see* 520.

526.9 MISCELLANEOUS SPECIFICATIONS FOR GLASS

U. S. Gov., Army Air Forces. Specification No.40830; 1944. Glass; Projection, for Projection Trainer.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C-430; 1941. Glass Stopcocks. This general discussion of stopcocks is written from the viewpoint of the user rather than the maker. Various types of cocks, their construction, grinding, lubrication, and care are discussed.

U. S. Gov., Federal Specification DD-S-431; 1944. Slabs; Cement-Mixing, Glass, Plain, Dental. Covers one type, grade, and class. Gives requirements for material, workmanship, surfaces, edges, finish, sizes, and dimensions; method of sampling and inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57F1; 1941. Filters; Ray, Glass.

References.—Methods of analysis, standard samples of glass, *see* 520; electron vacuum tubes, *see* 718.62.

527. MIRRORS

U. S. Gov., Army Air Forces. Specification 40653-A; 1944. Mirror; Emergency Signaling.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS27-36; 1936. Mirrors. This standard includes plate glass mirrors made from polished plate glass, as well as so-called "shock" mirrors 6 by 8 in. and larger made from common window glass, which have previously been known as common glass, sheet glass, crystal, or shock mirrors. Detail requirements are given for plate glass mirrors and shock mirrors, standard thicknesses, silvering, quality designation and guarantee for several grades of plate glass mirrors, method of inspection, and glossary of terms. Initiated by Mirror Manufacturers Assn.

U. S. Gov., Navy Dept. Specification 18M8; 1944. Mirrors; Signaling, Emergency.

U. S. Gov., Navy Dept. Specification 26M11; 1944. Mirrors (Shipboard Use).

U. S. Gov., Treasury Dept., Procurement Div., 256B; 1943. Mirrors; Plate Glass, Framed. Covers either No.1 or No.2 quality, and three classes of wood frames—(A)mahogany finish, (B)oak, and (C)walnut finish. Gives requirements for silvering, backing, bevel-edge mirrors, chips, design, construction, back, assembling, sizes and dimensions, tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-13A; 1938. Mirror; Wall, Hospital.

U. S. Gov., Veterans Administration. Specification VA-G-55c; 1939. Mirrors; Wall.

References.—Other plate glass, *see* 521.1; methods of analysis, standard samples of glass, *see* 520.

528. GLASS CLOTH

American Society for Testing Materials, D 578-44T; 1944. Tentative Methods of Testing and Tolerances for Glass Yarn. For continuous filament and staple glass yarns, both single and plied, and both single and multiple wound. Gives definitions, breaking strength tolerances, glass content, test procedures for single strand, twist, yarn diameter, and glass content.

American Society for Testing Materials, D 579-44; 1944. Methods of Testing and Tolerances for Woven Glass Fabrics. Covers woven continuous filament and staple glass fabrics for electrical purposes, except woven glass tapes. Gives definitions, tolerances, and methods of testing.

American Society for Testing Materials, D 580-44; 1944. Methods of Testing and Tolerances for Woven Glass Tapes. These methods apply to woven continuous filament and staple glass tapes. Gives definitions, tolerances, and methods of testing.

American Society for Testing Materials, D 581-44; 1944. Methods of Testing and Tolerances for Woven Glass Tubular Sleeving and Braids. These methods apply to continuous filiment and staple glass tubular sleeving and braid. Gives definitions, inside diameter, wall thickness, weight, construction, yarn number, glass content, and methods of testing.

U. S. Gov., Navy Dept. Specification 32C15d; 1944. Cloth, Tape, and Thread; Glass, Fibrous (for Lagging Insulation).

530-539 CLAY AND CLAY PRODUCTS

531. CLAY

531.0 GENERAL ITEMS

American Ceramic Society. Journal of A.C.S. for June 1928. Method for Behavior in Firing. For determination of progressive change in porosity and progressive change in volume in the firing process for clay, requirements on preparation of test pieces, placement in furnace, rate of heating, drawing from furnace, cooling, weighing, saturating and weighing, for samples drawn at different temperatures, calculation of apparent porosity, volume change, apparent and bulk specific gravity, and absorption.

American Ceramic Society. Journal of A.C.S. for June 1928. Method for Drying Shrinkage, 1920. Size and preparation of test pieces, method for measurement of plastic volume, dry volume and determination of volume shrinkage, and linear shrinkage.

American Ceramic Society. Journal of A.C.S. for June 1928. Method for Sampling Ceramic Materials As Delivered, 1922. Time for sampling, method of collecting and size for underground material and for ground or pulverized material, treatment of gross sample.

American Ceramic Society. Journal of A.C.S. for June 1928. Method for Shrinkage and Pore Water, 1928. Method of determination from data on plastic volume and dry volume.

American Ceramic Society. Journal of A.C.S. for June 1928. Method for Slaking Test, 1928. Size and preparation of test piece, procedure for testing time of slaking.

American Ceramic Society. Journal of A.C.S. for June 1928. Method of Testing for Pyrometric Cone Equivalent, 1928. Applicable to fire brick, refractory materials, and clays. Requirements on sampling, size, shape, and preparation of test cones; rate of heating and method for determination of softening point.

American Ceramic Society. Journal of A.C.S. for June 1928. Method for Water Plasticity, 1920. Size and preparation of test piece, method of test by drying test piece and calculating the water of plasticity from loss in weight.

American Ceramic Society. Journal of A.C.S. for June 1928. Specific Gravity. Requirements on sampling and crushing of samples, method for determination of true specific gravity, apparent specific gravity, and bulk specific gravity.

American Ceramic Society. Journal of A.C.S. for June 1928. Tentative Test Method. Sag Tests, 1928. For determination of rate of softening under fixed conditions of load and heat treatment, as evidenced by transverse bending. Requirements on shape and size of test pieces, heating rate and transverse loading for clay and for fine and coarse grog bodies, determination of warpage ratio.

American Ceramic Society. Journal of A.C.S. for June 1928. Tentative Method. Sampling Clay Deposits. Method for preliminary and for extended sampling.

American Ceramic Society. Journal of A.C.S. for June 1928. Tentative Test Method. Transverse Strength, 1928. Preparation, shape, and size of test specimen, drying of specimen, test procedure, calculation of modulus of rupture, for clay specimens.

American Society for Testing Materials, C 71-42; 1942. Definitions of Terms Relating to Refractories. Defines fire-clay, plastic fire-clay, flint fire-clay, diaspore clay, nodular fire-clay, spalling, pyrometric cone equivalent, silica fire-clay, grog fire-clay mortar, and high-temperature bonding mortar.

American Society for Testing Materials, C 92-43T; 1943. Tentative Methods of Test for Sieve Analysis and Water Content of Refractory Materials. Covers procedures for a wet method and a dry method for sieve analysis of refractory materials and also procedures for determining the water content of refractory materials in the wet condition. Gives requirements for sieves, sample, water content, wet sieve analysis, and dry sieve analysis.

American Society for Testing Materials, C 179-43T; 1943. Tentative Method of Test for Combined Drying and Firing Shrinkage of Fireclay Plastic Refractories. Covers a procedure for determining the combined drying and firing shrinkage of high heat duty and super heat duty fireclay plastic refractories. Gives requirements for apparatus, test specimens, procedure, and calculation and report.

American Society for Testing Materials, C 180-43T; 1943. Tentative Method of Panel Test for Resistance to Thermal and Structural Spalling of Fireclay Plastic Refractories. Covers the procedures for determining the resistance of high heat duty and super duty fireclay plastic refractories to the separate and combined effects of structural and thermal spalling. Gives requirements for apparatus, test specimens, procedure, preheating test panels, and spalling procedure.

American Society for Testing Materials, C 181-43T; 1943. Tentative Method of Test for Workability Index of Fireclay Plastic Refractories. Covers a procedure for obtaining the workability index of fireclay plastic refractories materials by measuring the plastic deformation of a molded test specimen when subjected to impacts. Gives requirements for apparatus, test specimens, procedure, calculation, and report.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. China Clay and Paper Clay. Covers definition, properties, occurrence, purity and grades, uses, containers, and substitutes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Clay, Flint, Sample 97; and Clay, Plastic, Sample 98. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis, for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

531.1 BALL CLAY

531.2 CHINA CLAY

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. China Clay and Paper Clay. Covers definition, properties, occurrence, purity and grades, uses, containers, and substitutes.

531.3 FIRE CLAY

American Society for Testing Materials, C18-41; 1941. Methods of Chemical Analysis of Refractory Materials. Cover procedures for the chemical analysis of fire-clay, silica, high-alumina, and magnesite refractories, and of chrome ore and chrome refractories. Includes the determination of moisture, loss on ignition, silica, iron, aluminum and titanium oxides, lime, magnesia, and alkalies; reagents and special solutions required; preparation of samples; and reproducibility of results.

American Society for Testing Materials, C 105-41; 1941. Ground Fire Clay as a Mortar for Laying-Up Fireclay Brick. For use in the laying-up of refractory brick. Gives quality, commercial and fine grades based on particle size, four classes of fire clay, depending on refractories used; sampling and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Fireclay. Covers definition, properties, specifications, and containers.

U. S. Gov., Federal Specification HH-C-451b; 1944. Clay; Fire, Ground. Covers two degrees of fineness—(C)commercial and (F)fine. Covers a heat-resistant material composed entirely, or principally, of ground plastic fire clay used primarily as a mortar in laying up brick and shapes. Gives requirements for fineness, and pyrometric cone equivalent; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification HH-M-611a; 1943. Mortar; Air-Setting, Refractory, Bonding (Wet and Dry Types). Covers two types—(I) wet and (II) dry; and three grades for each type—(A) high-heat and super-duty, (B) moderate, intermediate, and slag-resistant duty, and (C) back-up duty. Gives requirements for material and workmanship, plasticity and preservation, fineness, troweling, dipping, bonding strength, and heat soaking; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Federal Specification HH-R-191; 1936. Refractories; Fire-Clay, Plastic. Covers one grade. Gives requirements for material and workmanship, silica content, pyrometric cone equivalent, water content, and shrinkage; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 32C6d; 1942. Clay; Fire.

U. S. Gov., Navy Dept. Specification 32R1c; 1944. Refractories; Fire-Clay, Plastic, Superduty.

U. S. Gov., Navy Dept. Specification 32R3c; 1945. Refractories; Baffle-Material.

References.—Definitions, *see* 531.0; methods of sampling and of testing, *see* 531.0; fire brick and tile, *see* 534.12; fire clay flue lining, *see* 534.29.

531.4 KAOLIN

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-35; 1927. Kaolin Caustic, for Gas Mask Canisters.

531.5 CLAY PRODUCTS, PIPE, CONDUIT, ETC.

American Assn. of State Highway Officials, M65-42. Standard Specifications for Clay Pipe. Covers standard-strength clay pipe for the conveyance of sewage, industrial wastes, and storm water; and extra-strength clay pipe for the construction of culverts and where high-strength pipe are desired. Gives materials and manufacture, resistance to action of acids, physical properties, test specimens, measurement and observation of specimens, acceptance and rejection, sizes and dimensions, permissible variations in dimensions, absence of defects, salt glaze, finish of ends, fittings, marking, inspection, rejection, marking of rejected specimens, and methods of testing.

American Assn. of State Highway Officials, T33-42. Standard Methods of Testing Culvert Pipe, Sewer Pipe, and Drain Tile. Covers tests for concrete pipe, cast-iron pipe, clay pipe, and drain tile. Gives three-edge bearing method, sand-bearing method, absorption test, freezing and thawing test for drain tile, and test for resistance to action of acids for clay pipe.

American Public Works Assn. Sewers, J1-38; 1938. Includes vitrified sewer pipe and vitrified liner plates; sewer pipe in accordance with A.S.T.M. Specification C13, salt-glazed vitrified clay or shale liner plates for general quality, finish, size and form, weight, specimen, and absorption test.

American Society for Testing Materials, C 13-44 T; 1944. Tentative Specifications for Standard Strength Clay Sewer Pipe. Intended for the conveyance of sewage, industrial wastes, and storm water. Covers materials and manufacture, resistance to action of acids, physical test requirements, acceptance or rejection of results of test, sizes and dimensions, workmanship. and finish, and inspection and rejection.

American Society for Testing Materials, C 200-44 T; 1944. Tentative Specification for Extra Strength Clay Pipe. Covers scope, class, materials and manufacture, resistance to action of acids, physical test requirements, absorption test, acceptance or rejection on results of tests, size and dimensions, workmanship and finish, and inspection and rejection.

Assn. of American Railroads, Telegraph and Telephone Section, 1-C-9. Vitrified Clay Conduit. Includes round or square bore, single duct and square bore two, three, four, six, or nine duct multiple clay conduit for wires and cables. Requirements as to quality of materials, workmanship, dimensions, and tests.

Clay Sewer Pipe Assn., Inc. Handbook Vitrified Clay Sewer Pipe and Kindred Clay Products, 1942. Includes dimensions and weights of salt glazed vitrified clay sewer pipe and fittings, fire clay flue linings and fittings, stove pipe and fittings, wall copings and fittings, chimney tops and bases, half traps, traps, grease traps, meter boxes, septic tanks, and liner plates.

U. S. Gov., Federal Specification SS-P-361a; 1942. Pipe; Clay, Sewer. Covers two grades—standard strength and extra strength; two types—bell and spigot, and butt joint (with separate reinforced concrete or clay collars); sizes—from 4 to 36 in. for standard strength, and 6 to 36 in. for extra strength; and either glazed or not glazed. Gives requirements for materials, workmanship and finish, physical characteristics, fittings, absorption, strength, dimensions, collars, and resistance to action of chemicals; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov. Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Vitrified Clay Culvert Pipe.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification E-9Ye; 1943. Electrical Apparatus, Distributing Systems, and Wiring (Emergency Edition). Includes requirements for clay conduit.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-467A; 1932. Conduit; Vitrified Clay.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; porcelain products, *see* 532.2; bricks and tiles, *see* 534; burnt clay ballast, *see* 511.73.

531.6 ENAMEL FOR ENAMELWARE

American Ceramic Society. Journal of A.C.S. for September 1930. Method of Test for Determination of Deformation Temperature of Enamel, 1930. Requirements on preparation of sample, test procedure, rate of heating, etc.

American Ceramic Society. Journal of A.C.S. for September 1930. Method of Test for Fineness of Wet-Milled Enamel, 1930. Standard method for sieve testing of fineness.

American Ceramic Society. Journal of A.C.S. for September 1930. Tentative Test Method. Determination of Resistance of Sheet-Steel Enamel to Deflection, 1930. Requirements for test machine, preparation of test pieces, test procedure.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Porcelain Enamel Frit. Covers definition, manufacture, properties, weight per cubic foot, specifications, substitutes, containers, shipping regulations, uses, and order instructions.

Porcelain Enamel Institute, Inc. Reflectance Test for Opaque White Porcelain Enamel, 1937. Includes requirements for manner in which reflectance is determined, manner of applying reflectance data in research and in commercial classification, and diagram showing interrelation of reflectance, reflectivity, and opacity.

Porcelain Enamel Institute, Inc. Specifications for Architectural Porcelain Enameled Parts, 1940. Covers requirements for materials, processing, the finished part, and packing.

Porcelain Enamel Institute, Inc. Specifications for First Quality Tops for Breakfast Sets, Dinette Sets, Kitchen Tables, and Kitchen Cabinets, No.161; 1940. All tops conforming to these specifications shall be labeled and guaranteed by the manufacturer. Gives requirements for finished top—surface hardness, gloss, acid resistance, heat resistance, color, flat surfaces, straight edges, thickness of porcelain enamel, general requirements, surface texture, uniformity of finish, color match, and workmanship; materials; processing-fabrication of metal and application of porcelain enamel; and protection.

Porcelain Enamel Institute, Inc. Tentative Screen Test for Wet-Milled Porcelain Enamel, 1938. Includes requirements for equipment, sample, and procedure.

Porcelain Enamel Institute, Inc. Tentative Standard Impact Test for Laboratory Specimens of Porcelain Enameled Sheet Iron and Steel, August 1940. The purpose of this test is to provide a method of measuring the relative impact resistance of laboratory specimens prepared from different enamels or from the same enamel under different conditions. Covers specimens, apparatus, test procedure, precautions, treatment of data, and appendix.

Porcelain Enamel Institute, Inc. Tentative Standard Test for Sagging of Iron and Steel Sheets for Porcelain Enameling, October 1940. Sagging may be defined as the inability of the metal to support its own weight at enameling temperatures and should not be confused with warping. Covers equipment, specimens, test procedure, and bibliography.

Porcelain Enamel Institute, Inc. Tentative Standard Torsion Test for Laboratory Specimens of Porcelain Enameled Sheet Iron and Steel, September 1940. This test involves both twisting and, to some extent, bending of the specimen; and is to measure, under the specified conditions, the relative resistance to failure of laboratory specimens prepared from different enamels or from the same enamel under different conditions. Covers specimens, apparatus, test procedure, treatment of data, and appendix.

Porcelain Enamel Institute, Inc. Tentative Standard Test for Warpage of Flatware, 1941. The term warpage is considered to include any deviation of the nominally flat surface of a finished piece from flatness regardless of the source of such deviation. Covers apparatus, test procedure, and precautions.

Porcelain Enamel Institute, Inc. Test for Acid Resistance of Porcelain Enamels, Part 1—Flatware, 1940. Covers requirements for specimens, preparation of specimens, treatment, grading, and precautions for commercial test, umpire test, and research test.

Porcelain Enamel Institute, Inc. Test for Resistance of Porcelain Enamels to Gouging, 1942. The resistance of enamels to mechanical wear may be considered as the resultant of the resistance of the surface layer to abrasion and the resistance of the underlying enamel structure to crushing. Covers type of treatment of specimens, type of specimens required, gouging apparatus and its operation, method and equipment for inspecting tested specimens, procedure of test, and analysis of results.

Porcelain Enamel Institute, Inc. Test for Resistance of Porcelain Enamels to Surface Abrasion, 1942. The resistance of enamels to mechanical wear may be considered as the resultant of the resistance of the surface layer to abrasion and the resistance of the underlying enamel structure to crushing. Covers equipment required, test specimens, test procedure, treatment of data, and precautions and corrections.

U. S. Gov., Army Air Forces. Specification 14121; 1943. Finish; Porcelain Enamel.

U. S. Gov., Army-Navy Aeronautical Specification AN-E-4; 1942. Enamel; Porcelain.

U. S. Gov., Navy Dept. Specification 52 E 3; 1944. Enamel; Porcelain (for Coating).

References.—Methods of testing clay and clay products, *see* 531.0; enameled cast-iron bath tubs and sinks, *see* 612.21, 612.23.

531.7 BENTONITE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Bentonite (Wilkinite, Colloidal Clay). Covers definition, properties, occurrence, grades, and uses.

532. CHINA AND PORCELAIN WARE

532.1 TABLE CHINAWARE

American Hospital Assn., 64-4. Vitrified Chinaware. Based on U. S. Gov. Federal Specifications M-C-301 for Vitrified Chinaware.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R5-24; 1924. Hotel Chinaware. This recommendation establishes a simplified list of standard types and sizes of hotel chinaware, covering plates, dishes, butters, bowls, bakers, cups, saucers, etc. Sponsored by the American Hotel Assn. of U. S. and Canada and the American Vitrified China Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R33-25; 1925. Chinaware (Cafeteria and Restaurant). This recommendation establishes a schedule of types and sizes of restaurant and cafeteria chinaware, including plates, butters, coffee cups, mugs, nappies, bowls, dishes, jugs, etc. Sponsored by the American Hotel Assn. of U. S. and Canada, American Vitrified China Manufacturers Assn., and National Restaurant Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R39-25; 1925. Dining-Car Chinaware. This recommendation establishes a simplified list of standard types, sizes, and capacities of dining-car chinaware, including plates, butters, dishes, cups, bowls, bakers, etc. Sponsored by American Vitrified China Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R40-25; 1925. Hospital Chinaware. This Recommendation establishes a simplified list of standard types and sizes of hospital chinaware, including plates, butters, dishes, cups, bowls, bakers, etc. Sponsored by the American Hospital Assn and the American Vitrified China Manufacturers Assn.

U. S. Gov., Federal Specification M-C-301a; 1943. Chinaware; Vitrified. Shall be three weights known as thick ware, hotel (or rolled-edge) ware, and medium-weight ware. Gives requirements for material, workmanship, design, marking of ware, decoration of ware, absorption, impact, chipping, size and tolerance, method of sampling, inspection, test, packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-66; 1939. Cup; Custard and Feeding.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; table glassware, *see* 523.

532.2 PORCELAIN PRODUCTS

References.—Table chinaware, *see* 532.1.

532.20 General Items

Porcelain Enamel Institute, Inc. Tentative Standard Impact Test for Laboratory Specimens of Porcelain Enameled Sheet Iron and Steel, August 1940. The purpose of this test is to provide a method of measuring the relative impact resistance of laboratory specimens prepared from different enamels, or from the same enamel under different conditions. Covers specimens, apparatus, test procedure, precautions, treatment of data, and appendix.

Porcelain Enamel Institute, Inc. Tentative Standard Test for Sagging of Iron and Steel Sheets for Porcelain Enameling, October 1940. Sagging may be defined as the inability of the metal to support its own weight at enameling temperatures and should not be confused with warping. Covers equipment, specimens, test procedure, and bibliography.

Porcelain Enamel Institute, Inc. Tentative Standard Torsion Test for Laboratory Specimens of Porcelain Enameled Sheet Iron and Steel, September 1940. This test involves both twisting and, to some extent, bending of the specimen and is to measure, under the specified conditions, the relative resistance to failure of laboratory specimens prepared from different enamels or from the same enamel under different conditions. Covers specimens, apparatus, test procedure, treatment of data, and appendix.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-390. Porcelain Enamel.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS30-31; 1931. Colors for Sanitary Ware. This standard designates colors to be used as a guide in production of sanitary ware, plumbing fixtures, and allied products made of vitreous china, porcelain (all-clay) enameled iron, metals, wood, or glass.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS63-38; 1938. Colors for Bathroom Accessories. This standard covers seven colors adopted as standard for bathroom accessories, provides a standard sample plan for control of these colors at the source, specifies a method for visual comparison, and supplies a means for identification of standard colors from producer to user. Sponsored by National Retail Dry Goods Assn.

532.21 Crucibles and Laboratory Porcelain Ware

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes dishes and crucibles, sizes and capacities selected as standard stock items, no detailed dimensions or specifications.

American Hospital Assn., 70-22. Jars for Dressings. Covers one type, one grade, and one class. Based on U. S. Gov., War Dept., Specifications 10-2399 for Jars for Dressings.

Manufacturing Chemists Assn. of the U. S. Laboratory Apparatus, 1922. Laboratory Porcelain Ware. Requirements on general quality, tolerance on capacity, test requirements for resistance to rapid heating and cooling, resistance to hot alkalies, freedom from porous surface, softening at high temperatures, standard sizes and dimensions for annealing cups, boats, casseroles, combustion capsules, high and low form crucibles and crucible covers, dishes, buchner funnels, gooch crucibles and covers, perforated plates for funnels, plates for color reactions, long spatula with knob, dupont nitrometer, requirements on surfaces to be glazed.

U. S. Gov., Navy Dept. Specification 50C11; 1938. Crucibles; Foundry, and Covers.

U. S. Gov., Navy Dept. Specification 50C4; 1938. Crucibles for Melting Aluminum.

U. S. Gov., Navy Dept. Specification 50C5a; 1942. Crucibles for Melting Steel.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2003B; 1941. Dishes; Evaporating, Porcelain.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2291; 1929. Ring; Filtering, Porcelain, Concentric.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; other laboratory apparatus, *see* 918.

532.22 Porcelain for Electrical Purposes

American Institute of Electrical Engineers. Standard No.41; 1930. American Standards Assn., C29a-1930.

Insulator Tests. Definitions, methods of making design and routine tests for both pin and suspension type insulators, including dry and wet flashover tests, corona and puncture tests, thermal and porosity tests.

American Society for Testing Materials, D 116-44; 1944. Methods of Testing Electrical Porcelain. Includes glazed and unglazed ceramic materials, wet process, cast, or dry process porcelain, dimensions of test specimen, apparatus required, and tests for tensile, compressive, flexural, and dielectric strength, impact resistance, effect of heat, porosity, power factor and dielectric constant.

American Society for Testing Materials, D 667-44; 1944. Methods of Testing Steatite Used as Electrical Insulation. Outline procedures for making the various tests described when they are required for an investigation or examination of steatite used as electrical insulation.

American Standards Assn., C 75.14-1944. Porcelain Radio Insulators (American War Standard). For the purpose of facilitating production of porcelain radio insulators. Covers applicable specifications and drawings, classification, material and workmanship, general requirements, detail requirements; methods of inspection and tests; packaging, packing, and marking for shipment; requirements applicable to individual government departments; and notes, drawings, and appendix.

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Porcelain for insulators shall be of the wet process, high grade, fine grained, and dense. The finished insulator shall be true to shape, free from bubbles and other imperfections, and smooth. The glaze shall be of brown color, smooth, firmly adherent, thoroughly vitrified and free from bubbles, cracks, or undissolved particles.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 144-39; 1939. Dry Process Porcelain Insulation. Electrical insulation for signal apparatus to be enclosed in housings for circuits of 660 volts or less. Compounding of glaze, finish, tolerance, unglazed color, and absorption tests.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 146-39; 1939. Pin Type Porcelain Insulators. For signal purposes, all voltage ranges, quality of material and workmanship, porosity, mechanical, dry and wet flashover tests, puncture test, and preliminary routine and optional tests.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-78; 1941. Strain Insulators. For use in communication plant. Gives general requirements, material and workmanship, mechanical requirements, electrical requirements, inspection and tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-93; 1943. Porcelain Knob Insulators. For use in the communication plant. Gives general requirements, material and workmanship, inspection and tests, packing, marking, and warranty.

Edison Electric Institute. Suggestions for Specifications for Low and Medium-Voltage Pin-Type Insulators, TD-51; 1937. Covers pin-type insulators made of porcelain and having a dry flashover of 85,000 volts or less. Gives requirements for material, insulator characteristics, insulator threads, tests, marking, packing and shipping, and inspection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Porcelain; Electrical. Covers definition, constants and physical properties, properties, derivations, grades, containers, specifications, uses, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Steatite, Cut and Molded Products (Steatite Talc, Lava). Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Wiring Methods. Includes cleats, knobs and tubes, dimensions for various wire sizes.

National Electrical Manufacturers Assn., 42-83; 1942. High voltage Insulator Standards. Contains manufacturing and rating standards for high and low voltage cap-and-pin type suspension insulators as well as rating standards for outdoor types of switch and bus insulators. The standard ratings for switch and bus insulators fulfill the requirements for 60-cycle dry 1-minute withstand, and 60-cycle 10-second wet withstand tests as established in A.I.E.E. Standard No. 22, Air Switches and Bus Supports, dated June 1940. The impulse withstand voltages for these same insulators fulfill the requirements for the Standard Basic Impulse Insulation Levels as published by the Joint Committee on Coordination of Insulation of A.I.E.E., E.E.I., and N.E.M.A., published January 1941. The rating data given are based on tests made in accordance with the method of test as outlined in A.I.E.E. Standard No. 41-A, Insulator Tests.

Underwriters' Laboratories, Inc. Standard for Porcelain Cleats, Knobs, and Tubes, 1937. Covers insulating cleats, knobs, and tubes for the support of conductors of open wiring or concealed knob-and-tube work of circuits involving potentials of 600 volts or less, in accordance with the National Electrical Code. Does not cover split knobs and multiple-wire cleats for conductors larger than No. 4 Awg, solid knobs for conductors larger than No. 0000 Awg, knobs not intended for over-surface wiring, nor tubes having an internal diameter greater than 2 1/2 in. General; design and construction; absorption; marking; tables and illustrations of single-wire cleats, two-wire cleats, solid knobs, split knobs, and tubes; and inspection of listed product.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H32; 1941. American Standards Assn., C2.2-1941 (National Electrical Safety Code). Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines. For line insulators for grade A and B construction; requirements for wet porcelain insulators for voltages of 2,300 or above, including ratio of flashover to puncture voltages; dry flashover test requirements for insulators for various voltage applications.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R73-27; 1927. One-Piece Porcelain Insulators. This recommendation establishes a list of standard designs and shapes of one-piece porcelain insulators disignated by the various manufacturers and catalogue numbers.

U. S. Gov., Joint Army-Navy Specification JAN-I-21; 1944. Insulators; Porcelain, Radio.

U. S. Gov., Navy Dept. Specification 16I2d; 1944. Insulators; Rigging.

U. S. Gov., Treasury Dept., Procurement Div., No.716; 1945. Cleats, Knobs, and Tubes; Porcelain, for Electrical Wiring, 0 to 600 Volt Service. Gives requirements for types, classes, sizes, glazing, material, workmanship, moisture-absorption resistance test, color, marking, and details; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-286A; 1941. Insulator; Type IN-56.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-296A; 1925. Insulator; Types IN-25, and IN-26, Pony Porcelain.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-303; 1924. Tube; Porcelain.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-306B; 1930. Insulator; Porcelain Knob.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; other electrical insulating materials and methods of testing, *see* 719.5; thread gauges for insulators, *see* 615.82; glass insulators, *see* 526.1; rosettes for electrical wiring, *see* 715.23; electrical panels and switchboards, *see* 714.4; telephone switchboards, *see* 718.22; fuse blocks, cut-out bases, *see* 714.22, 719.71; switches, sockets, receptacles, *see* 714.52, 715.21, 715.22; porcelain terminal blocks, *see* 718.29; strain insulators and cap and cone insulators for trolley line support, *see* 719.63.

532.23 Tubs, Sinks, Water-Closets, and Lavatories

American Public Health Assn. Essential Features in the Design of Sanitary Drinking Fountains, 1934. Fountains should be constructed of impervious material, such as vitreous china, porcelain, enameled cast iron, other metals, or stoneware. Gives essential features for jet, nozzle, bowl, drain, water supply pipe, adjustable valve, height of fountain, and waste opening and pipe.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R106-41; 1941. Hospital Plumbing Fixtures. This recommendation establishes a list of standard stock sizes and types of baby baths, receiving baths, prenatal baths, sitz baths, continuous-flow or prolonged-treatment baths, patients' baths, surgeons' scrub-up sinks, medicine sinks, instrument sinks, clinic sinks, service sinks, bedpan closets, and combination lavatory with integral instrument trays. Covers staple items, tolerances, grading rules, nomenclature, definitions, autoclave test for crazing, kiln support marks, special selection of large pieces, fixtures available in several materials, and back-flow connections. Sponsored by the American Hospital Assn., National Assn. of Master Plumbers, Sanitary Cast Iron Enameled Ware Assn., Vitreous China Plumbing Fixtures Assn., and the Sanitary Brass Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS4-29; 1929. Staple Porcelain (All-Clay) Plumbing Fixtures. This standard covers nomenclature and definitions, grading rules, types, sizes, dimensions, and general practices relating to porcelain (all-clay) plumbing fixtures. It includes dimensional diagrams of urinals, sinks, laundry trays, lavatories, receptors, and baths. Initiated by manufacturers, distributors, and users, represented by Advisory Committee on Porcelain (All-Clay) Plumbing Fixtures.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS20-42; 1942. Staple Vitreous China Plumbing Fixtures. Covers nomenclature and definitions; detail methods of grading water-closet bowls; low tanks; vitreous china lavatories, pedestals, and legs; and grading rules for other vitreous china plumbing fixtures. Standard dimensions and detail drawings are also given, including a standard system of marking and labeling. Initiated by the Vitreous China Plumbing Fixtures Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS29-31; 1931. Staple Seats for Water-Closet Bowls. A commercial standard selected and accepted by industry establishing standard types and finishes for varnished seats, sprayed seats, sheet covered seats, hard rubber seats, and molded composition sheets, permissible defects in wood and size of doweling in wood seats, requirements on thickness of shell or covering for molded seats, thickness of covering and standard colors for sprayed finish and sheet covered seats, standard types, weights, dimensions, spacing, and material of hinges.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS30-31; 1931. Colors for Sanitary Ware. This standard designates colors to be used as a guide in production of sanitary ware, plumbing fixtures, and allied products made of vitreous china, porcelain (all-clay) enameled iron, metals, wood, or glass. The standard gives also detail requirements for the six standard colors and method of making color comparisons.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 111-43; 1943. Earthenware (Vitreous—Glazed) Plumbing Fixtures. Covers items such as bath tubs, lavatories, kitchen sinks, laundry trays, and similar products. Gives requirements for material, body and glaze, coatings for unglazed surfaces of body, physical properties determined by test, method of inspection, grading, definitions, and labeling of items which meet the standard.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes projected, semirecessed and recessed drinking fountains made of one piece of vitreous china or enameled iron; cast iron, soapstone, and concrete laundry trays with or without backs with single, double, and triple compartments; various types of lavatories made of vitreous china and cast iron, together with accessories; sink and laundry tray combinations with fixtures for several types of sinks and trays; enameled cast iron, nickel-copper alloy, or corrosion-resisting steel alloy kitchen sinks covering several types, including drainboards and legs; service sinks made of vitreous china and cast iron; three types of vitreous china urinals, stall urinal with high tank or flush valve, pedestal, and wall-hanging wash-out urinals; regular weight black and white and light weight black composition seats for water-closet bowls; wood seats for water-closet bowls complete with hinge and bumpers; and various types of water closets including siphon jet water closet with floor outlet, wash-down water closet with floor outlet, siphon jet wall-hanging water closet, blow-out wall-hanging water closet, siphon jet close coupled combination water closet, reverse-trap close-coupled combination water closet, and reverse-trap integral water closet and tank combination. Gives requirements for material, workmanship, finish, trimmings, fittings, supports, nozzle heads, valves, piping, floor flanges, traps, and details for each item; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-534a; 1942, changed requirements for metals and finishes, standard materials, and illustrations, selections, and air gaps.

U. S. Gov., Navy Dept. Specification 30U1e; 1936. Urinals (Shipboard Use).

U. S. Gov., Navy Dept. Specification 30W1h; 1944. Water-Closets (Shipboard Use).

U. S. Gov., Public Health Service, Federal Security Agency, sponsor. American Standards Assn., Z4.2-1942. Specifications for Drinking Fountains. Gives detailed requirements in order to provide sanitary conditions at public drinking fountains.

U. S. Gov., Treasury Dept., Procurement Div., 262D; 1943. Fountains; Drinking Water, Portable, Sanitary, Compressed Air Water Feed, Insulated. Shall be of not less than 4-gal. capacity. Gives requirements for water container, cover and pump assembly, bubbler head and water feed tube, insulation, and accessories; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; grinding and general quality of porcelain ware and vitreous ware, *see* 532.20; plumbing symbols and plumbing practice, *see* 600.6; metal bath tubs, water closets, and *sinks*, *see* 612.21, 612.23.

532.9 MISCELLANEOUS CHINA AND PORCELAIN WARE

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes recommendations for size, shape, and height of porcelain spotting boards.

Porcelain Enamel Institute, Inc. Specifications for First Quality Tops for Breakfast Sets, Dinette Sets, Kitchen Tables, and Kitchen Cabinets, No.161; 1940. All tops conforming to these specifications shall be labeled and guaranteed by the manufacturer. Gives requirements for finished top—surface hardness, gloss, acid resistance, heat resistance, color, flat surfaces, straight edges, thickness of porcelain enamel, general requirements, surface texture, uniformity of finish, color match, and workmanship; materials; processing-fabrication of metal and application of porcelain enamel; and protection.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 11Yc; 1939. Marble and Tile Work. Includes requirements for bathroom accessories.

References.—Glazed tile and mosaic, *see* 534.25.

533. EARTHENWARE AND STONEWARE

533.1 BOWLS

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-3; 1924. Bowl; Earthenware, Lithographers'.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-2; 1941. Bowls; Mixing, Yellow-Crockery. There shall be but one type and grade, and sizes shall be as specified. Gives requirements for materials, workmanship, details, methods of inspection, and tests.

533.2 CROCKERY

U. S. Gov., Navy Dept. Specification 30C3; 1941. Crockery; Stateroom and Bathroom (Shipboard Use).

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-36; 1941. Crocks; Stoneware, Glazed, Without Cover. There shall be but one type and grade, and sizes shall be as specified. Gives requirements for materials, workmanship, handles, shape, capacities and dimensions, glazing, methods of inspection, and tests.

533.3 POTS

U. S. Gov., Navy Dept. Specification 64P14a; 1941. Pots; Bean (Boston).

U. S. Gov., U. S. Maritime Commission. Specification 63-MC-2; 1941. Cooking Ware; Chinaware, Vitrified, Fireproof. Gives requirements for types, grade, colors, materials, workmanship, design, marking, under-glaze colors, thickness, absorption, impact, heat shock test, dimensions, capacities, weights, tolerances, sampling, acceptance and rejection, retest, and drawings.

533.4 STOPPERS

Manufacturing Chemists' Assn. of the U. S. Manual Sheet C-4. Carboy Stoppers, Porous Earthenware—Specifications and Method of Testing. Standard Adopted 1938. Includes requirements for design, material, and porosity.

534. BRICKS AND TILE

References.—Sand lime brick, *see* 513; concrete brick, *see* 516.4; asphalt block, *see* 518.37.

534.1 BRICKS

534.10 General Items

American Assn. of State Highway Officials, T31-42. Standard Methods of Sampling and Testing Paving Brick. Gives scope, sampling, apparatus, barrel frame, driving mechanism, preliminary operation, abrasive charge, chemical composition of abrasive charge, scales, test specimen, procedure, percentage loss of weight, and rattler record.

American Ceramic Society. Journal of A.C.S. for June 1928. Method of Testing for Pyrometric Cone Equivalent, 1928. Applicable to fire brick, refractory materials, and clays. Requirements on sampling, size, shape and preparation of test cones, rate of heating, and method for determination of softening point.

American Public Works Assn. Specification for Vitrified Brick Pavement, D1-36; 1936. Requirements for brick include test in rattler for loss in weight, in accordance with A.S.T.M. Specification C7. Adopted by National Paving Brick Assn.

American Society for Testing Materials, C16-41; 1941. Method of Testing Fireclay Refractories Under Load at High Temperatures. Determination of resistance to deformation under specified compressive load, temperature and period of time. Apparatus, direct-load-type, and lever-type load test furnaces; test specimen, setting the test specimen, time-temperature schedules for heating the test furnace, and procedure.

American Society for Testing Materials, C18-41; 1941. Methods of Chemical Analysis of Refractory Materials. Covers procedures for the chemical analysis of fire-clay, silica, high-alumina, and magnesite refractories, and of chrome ore and chrome refractories. Includes the determination of moisture, loss on ignition, silica, iron, aluminum and titanium oxides, lime, magnesia, and alkalites; reagents and special solutions required, preparation of samples, and reproducibility of results.

American Society for Testing Materials, C20-41; 1941. Methods of Test for Apparent Porosity, Water Absorption, Apparent Specific Gravity, and Bulk Density of Burned Refractory Products. Covers properties of refractory products not attacked by water. Preparation of sample; dry weight, boiling, suspended weight, saturated weight, and volumes for the determination of apparent porosity, water absorption, apparent specific gravity, and bulk density, and report.

American Society for Testing Materials, C 24-42; 1942. Method of Test for Pyrometric Cone Equivalent (P.C.E.) of Refractory Materials. For comparison of test cones with standard pyrometric cones under prescribed conditions. Gives preparation of test cones, mounting, heating, and pyrometric cone equivalent.

American Society for Testing Materials, C 38-42; 1942. Method of Panel Test for Resistance to Thermal and Structural Spalling of Refractory Brick. Method of rapidly heating and cooling fire brick to simulate service conditions; description of preheating furnace and spalling furnace, panel frame and brickwork, temperature measuring instruments, and outline of procedure for test.

American Society for Testing Materials, C 67-44; 1944. American Assn. of State Highway Officials, T 32. American Standards Assn., A82.1; 1944. Methods of Sampling and Testing Brick. Covers procedures for the sampling and testing of brick. Definitions of terms, selection of test specimens, number of specimens, identification, modulus of rupture (flexure test), compressive strength, absorption test, saturation coefficient, and freezing and thawing test.

American Society for Testing Materials, C 71-42; 1942. Definitions of Terms Relating to Refractories. Defines fire-clay, plastic fire-clay, flint fire-clay, diaspore clay, nodular fire-clay, spalling, pyrometric cone equivalent, silica fire-clay, grog fire-clay mortar, and high-temperature bonding mortar.

American Society for Testing Materials, C 92-43T; 1943. Tentative Methods of Test for Sieve Analysis and Water Content of Refractory Materials. Covers procedures for a wet method and a dry method for sieve analysis of refractory materials and also procedures for determining the water content of refractory materials in the wet condition. Gives requirements for sieves, sample, water content, wet sieve analysis, and dry sieve analysis.

American Society for Testing Materials, C 93-42; 1942. Methods of Testing Insulating Fire Brick (Compressive Strength, Flexural Strength, and Permanent Linear Change After Heating). Includes dimensions for arrangement of testing equipment, test specimen, testing routines, and formulas.

American Society for Testing Materials, C 107-42; 1942. Method of Panel Test for Resistance to Thermal and Structural Spalling of High Heat Duty Fireclay Brick. Method of testing firebrick used in stationary boilers, malleable iron furnace bungs, and incinerators, using general requirements and procedure of A.S.T.M. Method C 38 with supplementary procedure for preheating test panels and for spalling test.

American Society for Testing Materials, C 113-36; 1936. Method of Test for Permanent Linear Change After Reheating of Refractory Brick. For determining the permanent linear change of intermediate, high heat, and super duty fireclay brick when heated under prescribed conditions. Requires use of down-draft type kiln and oxidizing atmosphere; location of test specimen in kiln, temperature measurements, and cooling period.

American Society for Testing Materials, C 122-42; 1942. Method of Panel Test for Resistance to Thermal and Structural Spalling of Super Duty Fireclay Brick. Procedure for determining the resistance of super duty fireclay brick to the separate and combined effects of structural and thermal spalling, using general requirements and procedure of A.S.T.M. Method C 38 with supplementary requirements for preheating test panels, and test for spalling.

American Society for Testing Materials, C 133-39; 1939. Methods of Test for Cold Crushing Strength and Modulus of Rupture of Refractory Brick and Shapes. Requirements for testing machine, design of bearing block and bearing edges, preparation of test specimen, and outline of procedure of tests.

American Society for Testing Materials, C 134-41; 1941. Methods of Test for Size and Bulk Density of Refractory Brick. For rectangular refractory brick and shapes. Apparatus, sampling, preparation of specimens, measurement of size, report, retests, and bulk density.

American Society for Testing Materials, C 135-40; 1940. Method of Test for True Specific Gravity of Burned Refractory Materials. For determination of specific gravity under prescribed conditions, but not applicable to materials attacked by water. Covers apparatus necessary, test specimen, and outlines the method of procedure.

American Society for Testing Materials, C 182-43T; 1943. Tentative Method of Test for Thermal Conductivity of Insulating Fire Brick. Outlines the general procedure for determining the comparative thermal conductivity of insulating fire brick under standardized conditions of testing. Gives requirements for apparatus, test specimen and guard brick, preparation of test specimen and guard brick, procedure, record of test data, calculations, and report.

Structural Clay Products Institute. Brick Engineering Handbook of Design, 1943. A 437-page handbook covering brick, mortar, brick masonry, footings, foundations, piers and columns, walls and partitions, chimneys, fireplaces and stacks, floors, walks and garden structures, moisture control, reinforced brick masonry, beams, lintels and slabs, R-B-M columns and piers, footings, foundations and retaining walls, brick sewers, miscellaneous structures of reinforced brick masonry, and appendices covering estimating tables, standard specifications, bibliography, and glossary of terms.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS60; 1940. Strength, Absorption, and Resistance to Laboratory Freezing and Thawing of Building Bricks Produced in the U. S. This paper reports the compressive and transverse strengths, water absorptions, saturation coefficients, and either the number of cycles of freezing and thawing required to produce failure or the loss in weight after 51 cycles for each of 3,368 bricks representing 525 gradings produced by 209 manufacturers. Average results for all tests except freezing and thawing are given for an additional 197 gradings or samples comprising a total of 1,190 specimens. These 197 gradings include samples from 20 additional manufacturers.

534.11 Face, Common, and Vitrified Brick

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for brick wearing surfaces—requirements for brick (conform to A.A.S.H.O. Specification M-40), preparation of subfloor, sand-cement bed, placing bedding course, laying and rolling the brick, testing the surface, applying asphalt filler, surface dressing, opening to traffic, and measurement and payment.

American Assn. of State Highway Officials, M40-42. Standard Specifications for Paving Brick. Covers vitrified clay brick for use in the construction of pavements. Gives manufacture, lugs, types and sizes, permissible variations in size, loss in rattler test, visual inspection, basis of acceptance, retesting, payment for cost of testing, and methods of sampling and testing.

American Assn. of State Highway Officials, M91-42. Standard Specification for Sewer Brick (Made From Clay or Shale). Gives scope, physical properties, size, visual inspection, and methods of sampling and testing.

American Public Works Assn. Sewers, J1-38; 1938. Includes sewer brick in three grades conforming to A.S.T.M. Specification C67.

American Public Works Assn. Specification for Vitrified Brick Pavement, D1-36; 1936. Includes requirements for quality, size and type, allowable variations, lugs, traffic markers, and tests of paving brick in accordance with A.S.T.M. methods. Adopted by National Paving Brick Assn.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Brick Pavements and Floors. Gives requirements for paving brick, physical characteristics, and sizes.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Brickwork. Gives classification of brickwork, face brickwork, detail of brickwork, samples, cement, sand, lime, mortar color, mortar, water supply, wood centering, scaffolding, anchors, backing, flue linings, vitrified tile wall, copings, cast concrete, protection, and pointing up.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Sewers and Drainage. Gives requirements for brick.

American Society for Testing Materials, C 7-42; 1942. Paving Brick. Covers brick manufactured from fire clay, semifire clay or shale, or combinations thereof.

American Society for Testing Materials, C 32-42; 1942. Sewer Brick (Made From Clay or Shale). Includes three grades depending on abrasiveness of fluid handled, gives requirements for compressive strength and maximum water absorption, and for sizes, with tests in accordance with A.S.T.M. Method C 67.

American Society for Testing Materials, C 62-44; 1944. American Assn. of State Highway Officials, M 114. Building Brick (Made From Clay or Shale). Covers brick made from clay or shale and burned and intended for use in brick masonry. Three grades of brick are covered—grade SW, brick intended for use where a high degree of resistance to frost action is desired; grade MW, brick intended for use where exposed to temperatures below freezing but unlikely to be permeated with water; grade NW, brick intended for use as back-up or interior masonry, or if exposed, for use where no frost action occurs. Covers physical properties, size and coring, visual inspection, sampling and testing, cost of tests, and explanatory note.

American Society for Testing Materials, C 126-44T; 1944. Tentative Specifications for Glazed Masonry Units. Includes ceramic glazed brick and ceramic glazed structural clay tile of clay, shale, fire clay, or mixtures thereof. Does not include salt glazed ware. Covers basis of purchase, description of units, compressive strength, absorption, properties of finish, color and texture, sizes, number of cells, shell and web thickness, tolerances in dimensions, scoring, coring, workmanship, inspection, test specimens, and methods of test.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R1-40; 1940. Reaffirmed without change, 1943. Vitrified Paving Brick. This recommendation establishes a simplified list of sizes and varieties of repressed lug brick, vertical-fiber lug brick, and wire-cut lug brick. Initiated by National Paving Brick Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R7-23; 1923. Face Brick and Common Brick. This recommendation establishes standard dimensions for length, thickness, and width of rough and smooth brick. Initiated by the brick industry now represented by the Structural Clay Products Institute.

U. S. Gov., Federal Specification SS-B-656; 1932. Brick; Building (Common), Clay. Covers three grades—(H) hard, (M) medium, and (S) soft; clay or shale. Gives requirements for material, workmanship, strength, and absorption; and methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification SS-B-671a; 1937. Amendment 1; 1941. Brick; Paving. Covers three types—vertical fiber lug, wire-cut lug, and repressed lug. Gives requirements for sizes, tolerances, material, workmanship, and manufacture; methods of sampling and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-B-691; 1933. Brick; Sewer, Clay. Covers one type; three grades—(A) vitrified, (B) hard, and (C) medium; and three sizes—1, 2, and 3. Gives requirements for absorption and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Definitions, methods of sampling and of testing brick, *see* 500, 534.10; methods of sampling and testing clay and clay products, *see* 531.0; sand lime brick, *see* 513; brick in building construction, *see* 518.5; brick in draining structures, *see* 518.6; brick in construction of tanks, pools, *see* 518.7; brick masonry, *see* 518.83; brick in bridge construction, *see* 518.4; brick pavement, *see* 518.35.

534.12 Fire Brick and Tiles, and Fire Clay Brick

American Refractories Institute. Fireclay Brick (Standard Sizes), 1939. Covers storage, laying, quantities, and standard dimensions of brick, splits, wedges, key, skew, circle, and arch brick, for standard and large standard sizes, and size deviations.

American Society for Testing Materials, C18-41; 1941. Methods of Chemical Analysis of Refractory Materials. Covers procedures for the chemical analysis of fire-clay, silica, high-alumina, and magnesite refractories. Includes the determination of moisture, loss on ignition, silica, iron, aluminum and titanium oxides, lime, magnesia, and alkalites; reagents and special solutions required, preparation of samples, and reproducibility of results.

American Society for Testing Materials, C27-41; 1941. Classification of Fireclay Refractories. Intended principally to group according to resistance to heat. Super duty, high heat duty, intermediate heat duty, and low heat duty fireclay bricks; and methods of testing.

American Society for Testing Materials, C 63-41; 1941. Refractories for Malleable Iron Furnaces With Removable Bungs and for Annealing Ovens. The selection of fireclay refractories for service in malleable furnaces under general conditions of operation and furnace design. Covers only burned products made from fireclay by the usual processes of manufacture and not intended to include products other than those regularly sold as fireclay brick. Malleable furnace bungs, furnace sidewalls and bridgewalls, lining of fire boxes and lower portion of stack, upper stack lining, annealing oven chamber; requirements for the various types of refractories, including size and warpage, test requirements, retests, and methods of testing.

American Society for Testing Materials, C 64-41; 1941. Refractories for Heavy Duty Stationary Boiler Service. The selection of fireclay refractories for heavy duty boiler furnaces in which the temperature of the combustion chamber is continuously, or a significant portion of the time, above 1,315° C. (2,400° F.). They may not apply to special conditions sometimes encountered in high-power utility boilers. Covers only burned products made from fireclay by the usual processes of manufacture and not intended to include products other than those regularly sold as fireclay brick. Zones of highest temperatures, division walls heated on both sides, zones of lower temperatures; requirements for the various types of refractories, including size and warpage, test requirements, and methods of testing.

American Society for Testing Materials, C 106-41; 1941. Refractories for Incinerators. For service in municipal and industrial incinerators under general conditions of operation and furnace design; type A for high heat duty, type F for intermediate, and type G for low heat duty fireclay brick. Requirements for various types as to refractoriness, shrinkage, spalling and modulus of rupture, and methods of testing.

American Society for Testing Materials, C 153-41; 1941. Refractories for Moderate Duty Stationary Boiler Service. For fire-clay brick lining of furnaces in which the temperature does not exceed 2,400° F. Zones of highest and of lowest temperatures, size and warpage, test requirements, methods of testing, and retests.

American Society for Testing Materials, C 154-41; 1941. Method of Test for Warpage of Refractory Brick and Tile. For the determination by measuring wedge and steel straight-edge across diagonals on concave side of brick; the actual maximum warpage.

American Society for Testing Materials, C 155-41T; 1941. Tentative Classification of Insulating Back-Up Block and Insulating Fire Brick. Pertains to two kinds of heat-insulating materials, each of which is intended for different service conditions. The materials included in the broad classification of insulating fire brick are divided into five specific groups.

American Society for Testing Materials, C 176-44; 1944. Fireclay Plastic Refractories for Boiler and Incinerator Service. Covers scope, high heat duty plastic refractories required for average service conditions, super duty plastic refractories for use in the zone of highest temperature and where severe spalling or slagging occurs, retests, and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Firebrick. Covers description, silica refractories, and specifications.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Firebrick and Fireclay (Refractories, Clay and Silica). Covers definition and occurrence.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Burned Refractory (40 Percent Al_2O_3), Sample 76; Burned Refractory (60 Percent

Al_2O_3), Sample 77; Burned Refractory (70 percent Al_2O_3), Sample 78; and Chrome Refractory, Sample 103. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analyses of similar materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement,1944. Standard Samples. Silica Brick, Sample 102. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R79-28; 1928. Malleable Foundry Refractories. This recommendation establishes a schedule of standard stock shapes and sizes of brick and tile for malleable foundry refractories. Initiated by the American Foundrymen's Assn. and the Malleable Founders Society.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R154-38; 1938. Cupola Refractories. This recommendation establishes standard sizes of cupola, tap-out, and slag-hole blocks. Initiated by American Ceramic Society, American Foundrymen's Assn., and the American Refractories Institute.

U. S. Gov., Federal Specification HH-B-671b; 1936. Brick; Fire Clay. Covers six classes—(1) back-up duty, (2) moderate heat duty, (3) slag resistant duty, (4) intermediate heat duty, (5) high heat duty, and (6) super duty. Gives requirements for material and workmanship, dimensional tolerances, and chemical and physical characteristics; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-B-681; 1933. Brick; Silica. Covers one grade. Gives requirements for composition, softening temperatures, apparent specific gravity, and dimension tolerance; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 32B2c; 1941. Brick; Fire-Clay.

U. S. Gov., Navy Dept. Specification 32B4c; 1942. Brick; Insulating, High-Temperature.

U. S. Gov., Navy Dept. Specification 32B6; 1935. Brick; Magnesite.

U. S. Gov., Navy Dept. Specification 32B7a; 1942. Brick; Refractory, Insulating.

U. S. Gov., Navy Dept. Specification 32B8; 1942. Brick; Silicon-Carbide, Refractory.

U. S. Gov., Navy Dept. Specification 32R2b; 1941. Refractory; Water-Wall, Boiler.

534.2 TILE

References.—Clay pipe and conduit, *see* also 531.5; refractory tile for foundries, *see* 534.12; concrete building tile, *see* 516.4; concrete drain tile and pipe, culvert pipe, and sewer pipe, *see* 518.62, 518.61, 518.67.

534.20 General Items

American Society for Testing Materials, C 43-36; 1936. Definitions of Terms Relating to Structural Clay Tile. Defines various tiles, general terms, raw materials, designation of dimensions, parts, openings, and surface features of hollow clay structural tile.

American Society for Testing Materials, C 112-36; 1936. American Standards Assn., A 83.1; 1942. Methods of Sampling and Testing Structural Clay Tile. Gives method of determination for weight, compressive strength, absorption, freezing, and thawing. For selection of samples, apparatus required, and outline of procedure for tests.

Tile Manufacturers' Assn. Basic Specification for Tile Work, K-300; 1939. Recommendations for the installation of tile in new construction and alterations on vertical and horizontal surfaces; for application over wood, masonry, concrete, or steel joist; for preparation of base, quality of materials, mortar mixtures, etc.

Tile Manufacturers' Assn. Index of Standardized Wall Tile Trimmers, 1932. Chart of 56 trimmers, together with their complementary angles, corners and tops, for normal trimmer requirements.

Tile Manufacturers' Assn. Tile Industry Research Bureau, R-TS-51; 1939. Specification for Installing Tile Floors on Thin Mastic Setting Bed. For installation over wood, cement, steel, roof decks, old terrazzo, natural stone, and tile floors, etc.; applicable to interior or exterior horizontal surfaces only (except ceilings) in hot or cold climates. Requirements for flexible binder, preparation of subfloor, priming, laying and grouting of tile, and precautionary measures.

534.21 Drainage Tile

American Assn. of State Highway Officials, M66-42. Standard Specifications for Drain Tile. Covers standard drain tile for ordinary land drainage at moderate depths, and extra quality drain tile for land drainage for considerable depths and where an extra quality is desired. Gives materials, manufacture, chemical test requirements, physical tests, method of determining failure, visual inspection, shape, sizes, color, smoothness, cracks, checks, chips, broken pieces, use of terms vitrified and hard-burned, making and reporting tests, general tests and inspection at factory, and rejection.

American Assn. of State Highway Officials, T33-42. Standard Methods of Testing Culvert Pipe, Sewer Pipe, and Drain Tile. Covers tests for concrete pipe, cast-iron pipe, clay pipe, and drain tile. Gives three-edge bearing method, sand-bearing method, absorption test, freezing and thawing test for drain tile, and test for resistance to action of acids for clay pipe.

American Public Works Assn. Sewers, J1-38; 1938. Includes sewer tile, vitrified conforms to A.S.T.M. Specification C13, concrete (plain) conforms to A.S.T.M. Specification C14, and reinforced-concrete sewer pipe to A.S.T.M. Specification C75. Gives tables to standard sizes with dimensions.

American Society for Testing Materials, C 4-24; 1924. American Standards Assn., A 6-1925. Drain Tile. Covers farm, standard, and extra quality drain tile of concrete or of clay, disallowed materials in chemical composition, requirements on crushing strength and absorption test, visual inspection, and, where specified, freezing and thawing test requirements.

U.S. Gov., Federal Specification SS-T-310; 1942. Tile; Drain, Clay. Covers tile of sizes from 3 to 30 in. in two grades—standard strength and extra strength; and two types—plain ends and plain ends with separate collars. Gives requirements for materials, workmanship, finish, dimensions, fittings, absorption and saturation coefficient, strength, and collars; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; concrete drain tile and pipe, culvert pipe, and sewer pipe, *see* 518.62, 518.61, 518.67.

534.22 Hollow Building Tile

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Clay Hollow Tile. Gives requirements for material, laying, mortar, and cleaning.

American Society for Testing Materials, C 34-41; 1941. American Standards Assn., A74.1-1942. Structural Clay Load-Bearing Wall Tile. Covers structural clay load-bearing wall tile made from surface clay, shale, fireclay, or mixtures thereof. Two grades of tile are covered: Grade LB-X.—suitable for general use in masonry construction and adapted for use in masonry exposed to weathering, provided they are burned to the normal maturity of the clay. They may also be considered suitable for the direct application of stucco; grade LB.—suitable for general use in masonry where not exposed to frost action, or for use in exposed masonry where protected with a facing of 3 in. or more of stone, brick, terra cotta, or other masonry. Physical properties, number of cells, shell and web thickness, tolerances, scoring, marking, visual inspection, rejection, expense of tests, sampling and testing, and explanatory notes.

American Society for Testing Materials, C 56-41; 1941. American Standards Assn., A76.1-1942. Structural Clay Non-Load-Bearing Tile. Covers structural clay nonload-bearing tile (partition, fire-proofing, and furring) made from surface clay, shale, fire clay, or mixtures thereof. One grade of tile is covered, designated grade NB. Absorption, number of cells and weights, permissible variations in dimensions, fire-proofing tile, scoring, marking, visual inspection, rejection, expense of test, and sampling and testing.

American Society for Testing Materials, C 57-39; 1939. American Standards Assn., A77.1-1942. Structural Clay Floor Tile. For two grades suitable for use in flat or segmental arches or in combination tile and concrete ribbed slab construction. Requirements for absorption, compressive strength, number of cells and weights, permissible variations in dimensions, visual inspection, scoring, and marking.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R12-26; 1926. Hollow Building Tile. This recommendation establishes a simplified list of sizes of hollow building tile covering standard load bearing wall tile, standard partition tile, standard split furring tiles, and standard book tile. Proposed revision being sponsored by the Structural Clay Products Institute.

U. S. Gov., Federal Specification SS-T-316; 1939. Tile; Partition, Gypsum. Covers one type. Gives requirements for shape, thickness, height and length, shell thicknesses, and compressive strength; methods of sampling, inspection, and tests; and requirements for marking.

U. S. Gov., Federal Specification SS-T-321; 1934. Amendment 1; 1936. Tile; Structural, Clay, Floor. Covers two grades— (M) medium and (S) soft. Gives requirements for number of cells, weight, and physical requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-T-341; 1943. Tile; Structural, Clay, Load-Bearing, Wall. Covers three grades—(H) hard, (M) medium, and (S) soft. Gives requirements for number of cells, weights, and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-T-351a; 1943. Tile; Structural, Clay, Non-Load-Bearing. Covers two grades—(M) medium and (S) soft. Gives requirements for number of cells, weight, and physical properties; method of sampling, inspection, and tests; and requirements for packing and marking.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; definitions, *see* 534.20; fire tests, *see* 534.10; use in building construction, *see* 518.5; gypsum building tile, *see* 514.62; concrete building tile and blocks, *see* 516.4.

534.23 Roof Tiles

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Clay Roofing Tile. Gives requirements for materials, flashings, roofing felt, laying, and guarantee.

Clay Products Assn. Tentative Standards for Vitrified Clay Products, 1937. Includes wall coping, double slant style, straight sections, ends, starters, tee sections, and corners, with sizes and detail dimension standards.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS6; 1938. Survey of Roofing Materials in the Southeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Southeastern States is described. Detailed studies of roofing materials in Greensboro, N. C.; Columbia, S. C.; Savannah and Atlanta, Ga.; Jacksonville and Orlando, Fla.; Birmingham, Ala.; Knoxville, Tenn.; and Charleston, W. Va.; are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 2,500 miles of highway, is included. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS29; 1939. Survey of Roofing Materials in the Northeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Northeastern States is described, with numerous comparative references to a similar survey in the Southeastern States. Detailed studies of roofing materials in Wilmington, Del.; Philadelphia, Pa.; New Haven, Conn.; Boston, Mass.; Manchester, N. H.; Portland, Maine; Rutland, Vt.; and Albany and Syracuse, N. Y., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 1,600 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 21,000 rural and small-town dwellings along 4,000 miles of highway in 20 Eastern States. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS75; 1941. Survey of Roofing Materials in the North Central States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the North Central States is described, with numerous references to similar surveys made previously in the Southeastern and Northeastern States. Detailed studies of roofing materials in Pittsburgh, Pa.; Cincinnati and Toledo, Ohio; Grand Rapids and Lansing, Mich.; Chicago, Ill.; Milwaukee, Wis.; St. Paul, Minn.; Bismarck, N. Dak.; Sioux Falls, S. Dak.; Omaha, Nebr.; Kansas City, Moberly, and St. Louis, Mo.; and Indianapolis, Ind., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 8,000 rural and small-town dwellings, along approximately 3,000 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 29,000 rural and small-town dwellings along 7,000 miles of highway in the 32 states covered by the three surveys. Forty-eight photographs, illustrating type of weathering of roofing materials and features of design and construction of roofs, are shown.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; fire tests, *see* 534.10; concrete roofing tile, *see* 516.4; use in building construction, *see* 518.5.

534.24 Terra Cotta

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual of Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Architectural Terra Cotta. Gives requirements for material, models, molding and fitting, cement, sand, lime, mortar, setting and anchoring, protection, and cleaning and pointing.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; terra cotta in building construction, *see* 518.51.

534.25 Glazed Tile and Mosiac

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Marble and Tile Work. Gives requirements for vitrified tile for walls and floors.

American Society for Testing Materials, C 126-44T; 1944. Tentative Specifications for Glazed Masonry Units. Includes ceramic glazed brick and ceramic glazed structural clay tile of clay, shale, fire clay, or mixtures thereof. Does not include salt glazed ware. Covers basis of purchase, description of units, compressive strength, absorption, properties of finish, color and texture, sizes, number of cells, shell and web thickness, tolerances in dimensions, scoring, coring, workmanship, inspection, test specimens, and methods of test.

Facing Tile Institute. Affiliated with Structural Clay Products Institute. Facing Tile, 1943. Grading Rules. Physical Requirements and Methods of Test for Structural Facing Tile—Glazed and unglazed. Gives tolerance for face dimensions, tolerances for depth of single faced units, tolerances for depth of two faced units, tolerances for distortion of face or edge, maximum permissible chippage, type of units, number of cells, shell and web thickness, scoring, coring, absorption, compressive strength, sampling and inspection, imperviousness test, chemical resistance test, crazing test, opacity test, absorption test, and compressive test.

Facing Tile Institute. Affiliated with Structural Clay Products Institute. Facing Tile, 1943. Specifications for Ceramic Glazed, Clear Glazed, and Salt Glazed Structural Facing Tile. Gives workmanship, sizes and shapes, unit design, and qualities.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R61-30; 1930. Clay Tiles for Floors and Walls. This recommendation establishes a list of standard sizes, shapes, and grades of glazed tiles and ceramic mosaic, including overall dimensions of the standard sizes, definition of grades, permissible warpage, wedging, crooked edge, spots, blots, and other defects for two grades each of white glazed and of colored glazed tiles, capacity of shipping containers. Sponsored by the Tile Manufacturers Assn.

U. S. Gov., Navy Dept. Specification 59T2c; 1939. Tile (Shipboard Use).

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 11Yc; 1939. Marble and Tile Work.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; installation and standard sizes, *see* 534.20; building construction, *see* 518.5.

534.29 Miscellaneous Specifications for Tile

American Society for Testing Materials, C 159-41T; 1941. Tentative Specifications for Vitrified Clay Filter Block for Trickling Filters. Cover vitrified clay filter block made from clay or shale or mixtures thereof. Two types of filter block are covered: Type I.—A one-piece filter block suitable for use in constructing a single-course trickling filter floor, which provides continuous drainage channels through the lower portion and aeration grilles in the upper portion of the blocks. Type II.—A two-piece filter block suitable for use in constructing a two-course trickling filter floor, which provides drainage and aeration. Compressive strength, absorption, shape, permissible variations in dimensions, apertures, shell and web thickness, workmanship and finish, marking, rejection, expense of tests, and sampling and testing.

Clay Products Assn. Tentative Standards for Vitrified Clay Products, 1937. Includes fire clay flue linings, rectangular and circular, and glazed tile flue or chimney pipe and fittings. Gives weights and standard dimensions of tile.

Facing Tile Institute. Affiliated with Structural Clay Products Institute. Facing Tile, 1943. Grading Rules, Physical Requirements and Methods of Test for Structural Facing Tile—Glazed and Unglazed. Gives tolerance for face dimensions, tolerances for depth of single faced units, tolerances for depth of two faced units, tolerances for distortion of face or edge, maximum permissible chippage, type of units, number of cells, shell and web thickness, scoring, coring, absorption, compressive strength, sampling and inspection, imperviousness test, chemical resistance test, crazing test, opacity test, absorption test, and compressive test.

Facing Tile Institute. Affiliated with Structural Clay Products Institute. Facing Tile, 1943. Specifications for Smooth Unglazed Structural Facing Tile. Colors are gray, cream, buff, and manganese and iron spot. Gives workmanship, shapes and sizes, unit design, select quality, and industrial quality.

U. S. Gov., Federal Specification RR-T-421; 1936. Tile; Wall, Enameled Iron. Covers two types—flat and crowned; two grades—acid-resisting, and ordinary; and two classes—sheet iron or sheet steel base and cast-iron base. Gives requirements for material, workmanship, size, and thickness of metal; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking for shipment.

References.—Methods of sampling and of testing clay and clay products, *see* 531.0; chimneys, *see* 518.55; sewers, *see* 518.67.

540-549 ABRASIVE MATERIALS, ASBESTOS, AND CHALK

541. ABRASIVES, NATURAL AND ARTIFICIAL

541.0 GENERAL ITEMS

Abrasive Grain Assn. Standard for Measurement of Capillarity of Electrically Fused Aluminum Oxide Abrasives for Polishing Uses, 1940. For determining bonding properties between grain particles and the glue; general requirements for freedom from foreign matter, testing apparatus, sampling, methods of test, cleaning of tubes, and tables of grit numbers.

American Foundrymen's Assn. American Standards Assn., Z43.-1941. Grinding, Polishing, and Buffing Equipment Sanitation. Prescribes the use of exhaust hoods and systems in removing dust, dirt, fumes, and gases generated through the grinding, polishing, and buffing of ferrous and nonferrous metals by means of grinding, polishing, scratch brushing, abrasive cutting-off wheels, grinding and polishing straps and belts.

Grinding Wheel Manufacturers Assn. Standard Markings for Identifying Grinding Wheels and Other Bonded Abrasives, 1944. Covers purpose and scope, sequence and markings, dual marking, wheel manufacturers' name, and chart showing standard marking system.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Abrasives; Aluminum Oxide. Covers definition, properties, grades, uses, specifications, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Abrasives; Silicon Carbide. Covers definition, properties, uses, specifications, substitutes, and containers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Silicon Carbide, Sample 112. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R118-40; 1940. Abrasive Grain Sizes. This recommendation gives a table of allowable limits for the sizing of aluminum-oxide and silicon-carbide abrasives for polishing uses and for grinding wheel manufacture. Initiated by Abrasive Grain Assn. and Grinding Wheel Manufacturers Assn.

U. S. Gov., Treasury Dept., Procurement Div., No. 616; 1943. Silicon Carbide; Abrasive, Polishing-Quality. Covers three classes—(A) coarse, (B) medium, and (C) fine; intended for use as an abrasive in grinding, polishing, and buffing operations. Gives requirements for material and fineness; methods of sampling and tests; and packaging, packing, and marking.

541.1 FLINT

References.—Flint coated abrasive products, *see* 541.4.

541.2 HONES, WHETSTONE, AND OILSTONES

U. S. Gov., Federal Specification SS-S-736; 1934. Stones; Sharpening. Covers five types—(I) stones, sharpening, mounted, (artificial and natural); (II) stones, sharpening, unmounted (artificial and natural); (III) slips, round-edge (artificial and natural); (IV) stones, scythe (artificial); and (V) sharpeners, knife (carving-knife hones, artificial). Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-27; 1921. Hone; Scotch.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2573A; 1940. Microtome; Knife Hone.

References.—Abrasive grain sizes, *see* 541.0.

541.3 ABRASIVE WHEELS

American Society of Mechanical Engineers, Society of Automotive Engineers, and National Machine Tool Builders' Assn. sponsors. American Standards Assn., B 5.17-1943. Markings for Grinding Wheels. This standard was developed to simplify a complicated condition in industry caused by the diversity of grinding wheel markings used by the various manufacturers of grinding wheels. Sequence of markings covers abrasive, grain size, hardness or grade, structure, bond or process. and manufacturer's record.

Grinding Wheel Manufacturers Assn. Chart Showing Mounted Wheels and Mounted Points, Standard Shapes. This chart shows about 85 different mounted wheels and mounted points with dimensions.

Grinding Wheel Manufacturers Assn. Charts Showing Standard Sizes of Wheels and Shapes for Portable Grinders, 1940. Covers standard flaring cups, cones, and threaded bushed plugs. Gives diagram of each type together with notes and table showing various standard sizes.

Grinding Wheel Manufacturers Assn. Chart Showing Standard Types and Special Shapes of Grinding Wheels. Shows diagrams of nine standard types, straight, cylinder, tapered two sides, recessed one side, straight cup, recessed two sides, flaring cup, dish, and saucer; and 24 special shapes. Gives key to letter dimensions for standard and special shapes.

Grinding Wheel Manufacturers Assn. Joint sponsor with International Assn. of Industrial Accident Boards and Commissions. American Standards Assn., B 7-19 43. Safety Code for the Use, Care, and Protection of Abrasive Wheels. Gives details concerning scope and definitions, handling, storage, inspection, general machine requirements, types of protection devices, protection hoods, protection chucks, flanges, mounting, speed, mounted wheels and mounts, general operating rules, and appendices covering speed conversion table, mounted wheels and points, grinding wheel safety, handling and storage, and standard wheel shapes.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Grinder, Emery, for Crosscut Saws.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-158. Grinder; Bench, Hand.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 159. Grinder; Portable Power.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R45-39; 1939. Grinding Wheels. This recommendation establishes a simplified list of standard types, sizes, and dimensions of grinding wheels, covering straight, tapered two sides, cylinder, recessed one side, recessed two sides, straight cup, flaring cup, dish, and saucer types, standard nomenclature for various classes of grinding work. Initiated by the Grinding Wheel Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R115-30; 1930. Full Disk Buffing Wheels. This recommendation establishes a simplified list of diameters for full disk 20-ply buffing wheels. Initiated by the industry now represented by the Buff and Polishing Wheel Manufacturers Assn.

U. S. Gov., Federal Specification SS-G-691; 1934. Amendment 1; 1943. Grindstones; Natural, Mounted. Covers four types—(A) power; (B) foot or hand-power, metal frame; (C) foot or hand-power, wood frame; and (D) hand-power. Covers grindstones of medium grit, natural sandstone. Gives requirements for wood and metal parts, workmanship, marking, finish, mounting, tolerances, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 40W1f; 1945. Wheels; Abrasive.

U. S. Gov., Treasury Dept., Procurement Div., No. 371; 1939. Wheels; Abrasive. Cover two classes—(I) aluminum oxide and (II) silicon carbide, of the following types—straight wheels, cylinder wheels, wheels tapered on two sides; wheels recessed on one side, straight cup wheels, wheels recessed on two sides, flaring cup wheels, dish wheels, and saucer wheels. Gives requirements for material, abrasives, bond, operating speed, mounting, arbor holes, bushings, surface condition, washers, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 503; 1941. Grindstones; Natural, Unmounted. Shall be one type, natural sandstone, suitable for general grinding. Gives requirements for arbor holes, surface, tolerances, trade mark, and table showing sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Dental grinding wheels, *see* 915.10; electric buffers and grinders, *see* 711.24; abrasive grain sizes, *see* 541.0.

541.4 ABRASIVE CLOTHS AND PAPERS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R89-40; 1940. Coated Abrasive Products. This recommendation establishes a simplified list of flint- and emery-coated abrasives and a simplified list of coated abrasives other than flint and emery. Initiated by Coated Abrasives Assn.

U. S. Gov., Federal Specification P-C-451; 1932. Amendment 2; 1941. Cloth; Abrasive, Aluminum-Oxide. Covers one type. Gives requirements for material (abrasive, backing, adhesive, and workmanship), form and dimensions, grade numbers, backing, tensile strength, and marking of sheets; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification P-P-101; 1932. Amendment 1; 1934. Paper; Abrasive, Artificial, Waterproof. Covers one type. Gives requirements for material (abrasive, backing, adhesive, and workmanship); form, dimensions, grain or grit numbers, backing, marking of sheets, and tensile strength; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification P-P-111; 1932. Amendment 3; 1943. Paper; Flint. Covers three classes—(A) ream flint finishing, (B) ream flint, and (C) roll flint. Gives requirements for material (abrasive, backing, adhesive, and workmanship); form and dimensions, grade numbers, backing, tensile strength, and marking of sheets and rolls; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., Federal Specification P-P-121; 1932. Amendment 2; 1938. Paper; Garnet. Covers one type and three classes—(A) ream garnet finishing, (B) ream garnet, and (C) roll garnet. Gives requirements for material (abrasive, backing, adhesive, and workmanship), form and dimensions, grade numbers, backing, tensile strength, marking of sheets and rolls, and coating; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification P-P-126; 1932. Paper; Garnet, Waterproof. Covers one type. Gives requirements for material (abrasive, backing, adhesive, and workmanship), form, dimensions, and grade numbers; backing, marking of sheets, and tensile strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 42C5b; 1939. Cloth; Crocus.

U. S. Gov., Treasury Dept., Procurement Div., No.728; 1945. Paper; Emery. Gives requirements for material, workmanship, comparison sample, sheet dimensions, grit grade numbers, backing, tensile strength, and marking of sheets; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-51B; 1929. Cloth; Emery.

U. S. Gov., Veterans Administration. Specification VA-M-273a; 1941. Emery Cloth.

541.5 PUMICE

U. S. Gov., Navy Dept. Specification 51P16; 1944. Pumice; Ground (Abrasive Pigment).

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-5A; 1939. Pumice.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1086; 1939. Pumice Powder; Dental.

U. S. Gov., Veterans Administration. Specification VA-D-20c; 1942. Laboratory Pumice.

U. S. Gov., Veterans Administration. Specification VA-D-21; 1938. Flour of Pumice.

541.6 ABRASIVE CLEANING COMPOUND

U. S. Gov., Army-Navy Aeronautical Specification AN-C-61a; 1944. Compound; Ceramic Spark Plug Cleaning.

541.9 MISCELLANEOUS ABRASIVES

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Corundum. Covers definition, constants, derivation and characteristics, grades, uses, containers, and substitutes.

U. S. Gov., Army Air Forces. Specification 14136; 1944. Grit; Blasting, for Carbon Removal.

545. ASBESTOS

545.1 ASBESTOS, UNMANUFACTURED

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Asbestos, Crude and Fiber. Covers definition, derivation and characteristics, uses, grades, containers, and substitutes.

545.2 ASBESTOS PAPER, MILLBOARD, AND ROLL BOARD

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R19-37; 1937. Asbestos Paper and Asbestos Millboard. This recommendation covers sizes, weights, widths, and thicknesses of asbestos paper and asbestos millboard.

U. S. Gov., Federal Specification HH-M-351a; 1942. Millboard; Asbestos. Covers one grade. Gives detail requirements for material and workmanship, dimensions, thicknesses, weight, and strengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 17I6d; 1942. Asbestos-Board; Insulating (Electrical), Impregnated.

U. S. Gov., Navy Dept. Specification 32A3; 1944. Asbestos-Composition; Hard, Sheet.

U. S. Gov., Navy Dept. Specification 32M1f; 1942. Millboard; Asbestos.

U. S. Gov., Navy Dept. Specification 32P4a; 1941. Paper; Asbestos, Corrugated.

U. S. Gov., Navy Dept. Specification 32P9; 1944. Paper and Tape; Asbestos, Reinforced With Cotton Mesh.

545.3 ASBESTOS PIPE COVERING AND CEMENTS

American Society for Testing Materials, C 194-44 T; 1944. Tentative Specification for Asbestos Thermal Insulating Cement. Covers scope, composition, physical properties, sampling and mixing, methods of testing, and rejection.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention 22.70; 1940. Detailed Specifications for Laying Fire Mains. Includes requirements for cast iron pipe, asbestos-cement pipe, pipe linings, fittings, suction pipe, protection, excavation and preparation, foundations, pipe laying, blocking, and jointing, valves, indicator posts and cast iron fittings, plugging dead ends, anchorage of tees, plugs, and bends, hydrostatic tests, backfilling, and special type pipe. Factory Mutual Bulletin of Loss Prevention 22.71; 1940. Anchoring Fire Mains. Gives diagrams of various methods of anchoring conditions.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS6; 1938. Survey of Roofing Materials in the Southeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Southeastern States is described. Detailed studies of roofing materials in Greensboro, N. C.; Columbia, S. C.; Savannah and Atlanta, Ga.; Jacksonville and Orlando, Fla.; Birmingham, Ala.; Knoxville, Tenn.; and Charleston, W. Va.; are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 2,500 miles of highway, is included. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS29; 1939. Survey of Roofing Materials in the Northeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Northeastern States is described, with numerous comparative references to a similar survey in the Southeastern States. Detailed studies of roofing materials in Wilmington, Del.; Philadelphia, Pa.; New Haven, Conn.; Boston, Mass.; Manchester, N. H.; Portland, Maine; Rutland, Vt.; and Albany and Syracuse, N. Y., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 1,600 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 21,000 rural and small-town dwellings along 4,000 miles of highway in 20 Eastern States. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

References.—Asbestos pipe covering, *see* 707.42.

545.4 ASBESTOS TEXTILES, YARNS, AND PACKING

American Society for Testing Materials, D 299-42; 1942. Specifications and Methods of Test for Asbestos Yarns. Gives definitions, requirements for breaking strength, number (cut), size of wire, twist, grades, and methods of test procedure.

American Society for Testing Materials, D 315-44; 1944. Specifications and Methods of Test for Asbestos Tape for Electrical Purposes. Asbestos tape woven from plain asbestos yarn and suitable for electrical purposes. Gives tolerances, width, thickness, weight, weave, construction, breaking strength, electrical properties, asbestos content, sizing, workmanship, finish, rolls, and methods of testing.

American Society for Testing Materials, D 375-44; 1944. Specifications and Methods of Test for Asbestos Roving for Electrical Purposes. Covers asbestos textile product for insulation on heat-resisting fixture wire, flexible cord or heater cord, etc. Gives definitions, number (cut), grades, iron content, methods of testing, and total iron content. A.S.T.M. Emergency Alternate Provision, EA-D 375; 1942, affected section 5 Iron Content, and section 14 Procedure.

American Society for Testing Materials, D 577-42; 1942. Methods of Testing Woven Asbestos Cloth. Apply to six grades of untreated crysotile asbestos cloth over 12 in. in width; requirements for sampling, test condition, width, thickness, and weight determinations; count, warp and filling, breaking strength, and asbestos content.

American Society for Testing Materials, D 628-44; 1944. Methods of Testing Asbestos Tubular Sleeving. Apply to woven and braided sleeving. Gives sampling, test condition, physical properties, and asbestos content.

American Society for Testing Materials, D 677-42 T; 1942. Tentative Specifications for Woven Asbestos Cloth. Apply to plain weave asbestos cloth in a weight range of 1.00 to 3.10 lbs. per square yard and in widths of 36 and 40 in.

U. S. Gov., Army Air Forces. Specification 16115-1; 1941. Fabric; Asbestos.

U. S. Gov., Federal Specification HH-C-536; 1936. Compound; Plumbing-Fixture-Setting. Covers one grade. Compound shall contain no oil. Gives requirements for composition, characteristics, condition in container, workability, behavior at 32 and 180° F., and behavior in water; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-41; 1931. Amendment 1; 1934. Packing; Asbestos, Rope and Wick. Covers one grade; wick packing, 1/4 in. only, and rope packing, all sizes 3/8 in. and larger. Gives requirements for material and workmanship, asbestos, and weight; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-46; 1930. Amendment 3; 1940. Packing; Asbestos, Sheet, Compressed. Covers one grade. Gives requirements for material and workmanship, construction, composition, asbestos fiber, rubber compound, tensile strength, tolerance, weight, solvents, and branding; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-HH-P-46; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for rubber content.

U. S. Gov., Federal Specification HH-P-51; 1930. Packing; Asbestos, Valve-Stem. Covers four types—(A) braided and lubricated with satisfactory oils, (B) braided and frictioned with rubber compound, (C) twisted and lubricated with satisfactory oils, and (D) twisted and frictioned with rubber compound. Gives requirements for material and workmanship, asbestos, yarn, construction, lubricant, and rubber compound; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 32C11d; 1944. Cloth, Strands, and Tape; Asbestos.

U. S. Gov., U. S. Army, Medical Dept. Specification 8-70C; 1942. Felt; Saddle and Asbestos, for Splints.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2210A; 1937. Mat; Asbestos.

References.—Asbestos electrical tape, *see* 719.51; asbestos copper gaskets, *see* 707.11; methods of testing cotton fabrics and yarns, *see* 300.4, 302.10; methods of testing rubber goods, *see* 200.

545.5 ASBESTOS BRAKE LINING

Brake Lining Manufacturers' Assn., Inc. Automotive Data Book, 1941, with 1942-43 Supplement. Asbestos Brake Linings and Clutch Facings. Lists name, model and year of car, truck, bus, or trailer and gives B.L.M.A. catalog number and data for clutch facings and for brake lining.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R66-27; 1927. Automobile Brake Lining. This recommendation establishes a list of standard stock sizes of brake linings covering widths and thicknesses. Initiated by the Society of Automotive Engineers.

545.6 ASBESTOS CLOTHING

American Standards Assn., L18.7 to L18.12-1944. Protective Occupational (Safety) Clothing. Leather and Asbestos Gloves and Mittens(American War Standard). L18.7-1944, Welders' Leather Gauntlet Gloves; L18.8-1944, Protective Leather Gloves, Steel-Stapled; L18.9-1944, Asbestos Gloves; L18.10-1944, Asbestos Gloves, Leather Reinforced; L18.11-1944, Asbestos Mittens; L18.12-1944, Asbestos Mittens, Leather Reinforced. Covers scope and purpose, types and sizes, pattern and design, construction, material, methods of test, identification, and appendix for breaking strength of asbestos cloth.

American Standards Assn., L18.14 to L18.17; 1944. Protective Occupational (Safety) Clothing (American War Standard). Asbestos Aprons, Cape Sleeves and Bibs, Leggings, and Coats. L18.14, Asbestos Aprons (Bib Type); L18.15, Asbestos Cape Sleeves and Bibs; L18.16, Asbestos Leggings (Knee and Hip Length); L18.17, Asbestos Coats. Covers types, sizes and dimensions, pattern and design, construction, materials, methods of test, identification, and appendix.

U. S. Gov., Federal Specification HH-M-391; 1933. Mittens; Asbestos. Covers one grade of the 1-finger type with special leather reinforcement. For use in steel, iron, and brass foundry work. Gives detail requirements; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 37M1b; 1944. Mittens; Asbestos.

U. S. Gov., Treasury Dept., Procurement Div., 508a; 1943. Gloves; Asbestos. Covers one grade in two types—(I) without gauntlet and (II) with gauntlet. Intended for use by welders, molders, steamfitters, and other workman handling hot tools or materials. Gives requirements for material, asbestos cloth, number of pieces, seams and stitching, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 11-2; 1936. Mittens; Asbestos, M1935.

545.9 MISCELLANEOUS MANUFACTURES OF ASBESTOS

American Society for Testing Materials, D 250-44T; 1944. Tentative Specifications for Asphalt-Saturated Asbestos Felt for Use in Waterproofing and in Constructing Built-Up Roofs. Cover quality of felt containing 85 percent asbestos, saturant, character of felt after saturation, surfacing, physical properties, stickiness, sampling, and testing.

American Society for Testing Materials, D 628-44; 1944. Methods of Testing Asbestos Tubular Sleeving. Apply to woven and braided sleeving. Gives sampling, test condition, physical properties, and asbestos content.

American Society for Testing Materials, D 655-44 T; 1944. Tentative Specifications for Asphalt-Saturated and Coated Asbestos Felts for Use in Constructing Built-Up Roofs. Cover asphalt-saturated and asphalt-coated asbestos felts in sheet form for use in the construction of built-up roofs.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention 22.70; 1940. Detailed Specifications for Laying Fire Mains. Includes requirements for cast iron pipe, asbestos-cement pipe, pipe linings, fittings, suction pipe, protection, excavation and preparation, foundations, pipe laying, blocking, and jointing; valves, indicator posts and cast iron fittings, plugging dead ends, anchorage of tees, plugs, and bends; hydrostatic tests, backfilling, and special type pipe. Factory Mutual Bulletin of Loss Prevention 22.71; 1940. Anchoring Fire Mains. Gives diagrams of various methods of anchoring conditions.

U. S. Gov., Federal Specification SS-P-351; 1940. Amendment 2; 1942. Pipe; Cement-Asbestos. Covers three classes—100, 150, and 200, suitable for 100, 150, and 200 lb. per square inch maximum working pressure, respectively. Gives requirements for material, workmanship, lengths, tolerances, inside diameter, wall thicknesses, and physical characteristics; methods of sampling, inspection, and tests; and requirements for preparation and marking of shipments.

U. S. Gov., Federal Specification SS-R-511; 1933. Roofing; Asphalt and Asbestos-Prepared, Mineral-Surfaced. Covers one type. Gives requirements for color and appearance, chemical and physical properties, and lap cement; methods of inspection, determination of weight and width, sampling and testing; requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification SS-S-284; 1945. Sheets; Corrugated, and Shapes; Cement-Asbestos. Covers two types of sheets with different pitch of corrugations. Gives requirements for materials and workmanship, fasteners, color, size, thickness, corrugations, absorption, and strength; methods of sampling, inspection, and testing; and packing and marking for shipment.

U. S. Gov., Federal Specification SS-S-291a; 1945. Shingles; Roofing, Cement-Asbestos. Covers five types. Give requirements for material and workmanship, breakage, supplementary shapes, nails and fastenings, color and finish, dimensions, holes for fastening and laps, absorption, and strength; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification SS-S-346; 1945. Siding; Cement-Asbestos. Covers two types—(I) shingles and (II) clapboards. Gives requirements for material and workmanship, breakage, holes for fastening and laps, nails and fastenings, color and finish, size and shapes, absorption, and strength; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 32F1b; 1943. Felt; Asbestos, Roll.

U. S. Gov., Navy Dept. Specification 32F3; 1939. Felt; Insulating, Asbestos.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 7Yg; 1934. Roofing, Siding, and Sheet Metal Work; Dampproofing and Membrane Waterproofing. Includes requirements for cement-asbestos shingles, cement-asbestos sheets, and asbestos-covered metal.

References.—Asphalt and tar roofing, *see* 505.16, 505.36; methods of testing saturated roofing felt, *see* 505.0.

546. CHALK

American Ceramic Society. Journal of A.C.S. for June 1928. Ceramic Whiting, 1924. Definition and use, requirements on general quality, composition and allowable variations, fineness, sampling, recommended methods of analysis.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Whiting. Covers definition, constants, occurrence, specifications, containers, shipping regulations, uses, and ordering instructions.

Toilet Goods Assn., Inc. Specification No.11; 1942. Precipitated Chalk. Gives requirements for color, odor, taste, identity, assay, acid insoluble, heavy metals, magnesium and alkalis, loss at 105°C., arsenic, lead, iron, barium, apparent density, particle size, rattle point and flow point, and sulfide sulfur.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S.A., Twelfth Revision, 1942. Chalk Mixture. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Prepared Chalk (Drop Chalk). Description, solubility, identification, acid-insoluble residue, heavy metals, assay, and storage. U.S.P. products of prepared chalk—Hydrargyrum cum Creta, Mistura Cretae, Pulvis Cretae Compositus.

U. S. Gov., Federal Specification SS-C-638; 1943. Crayons; Chalk, White. Covers two types—(I) extruded (round and hexagonal) and (II) molded. Gives requirements for material and workmanship, composition, size, weight, and breaking strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Other calcium carbonate compounds, *see* 833.3.

550-559 MICA, RARE MINERALS

551. CRUDE MICA

American Society for Testing Materials, D 351-38; 1938. Methods of Test for Grading and Classification of Natural Mica. Covers natural block mica and mica splittings for general use according to size; determination of grade based on the area of usable rectangle and minimum dimensions of one side; A.S.T.M. grading chart, measurement of thickness, and table of properties of various micas for quality.

American Society for Testing Materials, D351-42T; 1942. Tentative Method of Test for Power Factor and Dielectric Constant of Natural Mica. Includes natural block mica and mica splittings; description of test apparatus, selection of specimens, procedure, and information reported.

552. MANUFACTURED MICA

American Society for Testing Materials, D 607-42; 1942. Mica Pigment. Covers the finely divided mica commercially known as pigment mica, suitable for use in the manufacture of protective coatings. Gives composition and properties, number of tests, and methods of testing. A.S.T.M. Emergency Alternate Provision EA-D 607; 1942, changed the requirement for total residue.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Mica Powder. Covers definition, derivation, uses, grades, and types.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Mica; Stove. Covers definition, constants, color and properties, sources, grades, uses, quotations, ordering, and marketing.

National Electrical Manufacturers Assn. Manufactured Electrical Mica Standards, 39-55; 1939. Includes classification of muscovite and phlogopite (amber) mica splittings, composition, tolerances and properties of manufactured mica sheets and wrappers, dimensions of standard sheets, mica tubes, rings, and methods of test in accordance with A.S.T.M. Methods D 352, D 149, and D 348.

U. S. Gov., Navy Dept. Specification 17M5c; 1934. Mica; Plate (Pressed) and Sheet.

U. S. Gov., Navy Dept. Specification 52 M 3; 1943. Mica (Extender Pigment).

References.—Asbestos and mica, *see* 719.55.

560-569 PRECIOUS STONES AND IMITATION STONES

560. GENERAL ITEMS

561. DIAMONDS AND PEARLS

562. SAPPHIRES

570-579 SULPHUR, MAGNESIA, SALT, AND GRAPHITE

571. SULPHUR

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U.S., 1941. Sulfur. Chemical symbol, synonyms, description, and preparations for triturations, tincture, dilutions, and medications for use in homoeopathic medicines.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Sulphur. Covers definition, constants, solubility, derivation, grades, uses, specifications, substitutes, and containers.

Technical Assn. of the Pulp and Paper Industry. Analysis of Sulphur. Standard T 616 m-44; 1944. For use in the paper industry in the manufacture of bisulphite liquor. Covers sampling, apparatus, and analysis.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-137; 1940. Sulfur; Lump, Commercial.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-40B; 1938. Sulphur, for Use in Ammunition.

References.—Sulphur insecticides, *see* 881.21.

572. MAGNESIA

American Society for Testing Materials, C 193-44 T; 1944. Tentative Specification for 85 Percent Magnesia Thermal Insulating Cement. Covers scope, composition, physical properties, sampling and mixing, methods of testing, and rejection.

U. S. Gov., Federal Specification HH-M-61; 1934. Magnesia; Block, Cement, and Pipe-Covering (Molded). Covers one grade and four types—(I) standard thickness, (II) double standard thickness, (III) blocks, and (IV) cement or plaster. Shall contain not less than 85 percent of pure hydrated magnesium carbonate and not less than 10 percent long-fiber asbestos. Gives requirements for weight, length, thickness, size, cotton sheeting jacket, and bands; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-HH-M-61; 1942, changed requirements for cotton sheeting jacket; and deletes use of brass bands and changes their width and thickness.

References.—Magnesia pipe covering, *see* 707.43; boiler lagging sizes, *see* 707.40.

573. SALT

References.—Salt as a condiment, *see* 154.6; salt, sodium chloride, as a chemical reagent, medicinal, or agricultural supply, *see* 834.9.

574. GRAPHITE AND MANUFACTURES THEREOF

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Graphite. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

Crucible Manufacturers Assn. and American Foundrymen's Assn., sponsors. American Standards Assn., H13-1925. Outside Dimensions of Plumbago Crucibles for Non-Tilting Furnaces in Nonferrous Foundry Practice. Standard size numbers, corresponding outside dimensions, and approximate capacities.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Electric Furnace Graphite. Covers definition, constants, derivation, uses, purity, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Graphite (Plumbago). Covers definition, constants, properties, occurrence, derivations, purity, and grades; specifications, substitutes, containers, and uses.

U. S. Gov., Federal Specification SS-G-659; 1943. Graphite; Lubricating, Flake. Shall be on one grade only but three types differentiated as regards particle size and designated as small, medium, and large. Gives requirements for material, details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-64A; 1939. Graphite.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-41F; 1942. Graphite, for Use in Ammunition.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 54-1; 1925. Crucible and Cover for Nonferrous Metals.

References.—Carbon brushes for electric motors, *see* 711.42.

575. CARBONS AND ELECTRODES

575.1 CARBON, POWDERED

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Active Carbon. Covers definition, properties, derivation, uses, form available, sources, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Carbon Black (Gas Black. Channel Black). Covers definition, derivation, constants, uses, grades, containers, and substitutes.

U. S. Gov., Federal Specification SS-F-111; 1930. Facings; Foundry, Carbon-Base. Covers five grades. Wide latitude in selection of raw materials and processes of manufacture is permitted so that products of highest quality may be furnished. Gives detail requirements of each grade and methods of inspection and tests.

U. S. Gov., Navy Dept. Specification 50F2d; 1942. Facings; Foundry.

U. S. Gov., Navy Dept. Specification 51C33; 1943. Carbon; Activated, Granular.

References.—Charcoal, *see* 501.6; lampblack and bone black, *see* 842.4.

575.2 CARBON ELECTRODES

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Graphite Electrodes. Covers definition, constants, occurrence, specifications, and substitutes.

U. S. Gov., Federal Specification W-E-441; 1930. Electrodes; Carbon, Amorphous. Covers one grade. Gives requirements for finish, threading, threads, and dimensions; chemical requirements; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 17E1b; 1945. Electrodes; Graphite, for Electric Arc Welding and Cutting.

References.—Carbon brushes for electric motors, *see* 711.42.

575.3 CARBON PACKING

U. S. Gov., Navy Dept. Specification 33P 18d; 1943. Packing; Carbon.

575.4 CARBON FOR WELDING

U. S. Gov., Navy Dept. Specification 32C4a; 1941. Carbon; Block, Paste, and Rod (for Gas and Carbon Arc Welding).

590-599 MISCELLANEOUS NONMETALLIC MINERALS

591. FLUORSPAR AND CRYOLITE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Flourspar. Covers definition, constants, derivation, uses, impurities, forms available, and containers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Fluorspar, Sample 79. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

592. FELDSPAR

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Feldspar. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Feldspar, Potash, Sample 70; and Feldspar, Soda, Sample 99. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS23-30; 1930. Feldspar. This commercial standard classification covers ground feldspar used in the production of ceramic products, based on particle size and chemical composition. It is to be regarded as a classification rather than a definite purchase specification. Detail requirements are given for physical classification based on fineness of grindings and chemical classification based on composition as it influences use. This standard sets forth the procedure necessary for making physical and chemical tests. Initiated by National Feldspar Assn.

593. SILICA, DIATOMACEOUS EARTH, INFUSORIAL EARTH

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Silica. Chemical symbol, synonyms, description, and preparation for triturations for use in homoeopathic medicines.

American Society for Testing Materials, C 197-44 T; 1944. Tentative Specification for Diatomaceous Silica Thermal Insulating Cement. Covers scope, physical properties, sampling and mixing, methods of testing, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 3420A; 1944. Dehydrating Agent, Silica Gel. Covers granular form in three grades, composition, requirements, test procedures, packaging, packing, marking, reports, approval, and rejections. Similar specification, Army-Navy Aeronautical AN-D-6.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-6c-1; 1945. Dehydrating Agent (Activated).

U. S. Gov., Federal Specification SS-M-501a; 1933. Mold-Wash; Silica. Covers two grades—A and B. Gives requirements for material and its composition; methods of inspection and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 51S32; 1944. Silica-Gel.

U. S. Gov., Navy Dept. Specification 52S5d; 1941. Silica; Pulverized.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-333A; 1941. Silica Gel.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-504; 1926. Kieselguhr.

References.—Silica brick, *see* 534.12.

594. SOILS

American Assn. of State Highway Officials, M56-42. Standard Specifications for Materials for Stabilized Base Course. Covers the quality and size of sand-clay mixtures; gravel, stone, or slag screenings; or sand, crusher run coarse aggregate consisting of gravel, crushed stone, or slag combined with soil mortar or any combination of these materials for use in the construction of a stabilized base course. Gives types, general requirements, physical properties, moisture content, admixtures, and methods of sampling and testing.

American Assn. of State Highway Officials, M57-42. Standard Specifications for Materials for Embankments and Subgrades. Gives scope, definitions, general requirements, and methods of testing.

American Assn. of State Highway Officials, M61-42. Standard Specifications for Materials for Stabilized Surface Course. Gives scope, types, general requirements, detail requirements, moisture content, admixtures, and methods of testing.

American Assn. of State Highway Officials, T86-42. Standard Methods of Surveying and Sampling Soils for Highway Subgrades. Gives purpose of subgrade survey, scope of subgrade survey, equipment for subgrade survey, soil profile determination, examination of soil section, selection of samples, mapping the soil profile, and analysis of data.

American Assn. of State Highway Officials, T87-42. Standard Methods of Preparing Disturbed Soil Samples for Test. This method describes the preparation of soil samples as received from the field for mechanical analysis, the determination of the soil characteristics, and the compaction test. Gives apparatus, size of sample, preparation of sample, test sample for mechanical analysis, test sample for subgrade soil constants, and test sample for the compaction test.

American Assn. of State Highway Officials, T88-42. Standard Methods of Mechanical Analysis of Soils. This method describes a procedure for the quantitative determination of the distribution of particle sizes in soils. Gives apparatus, sample, coarse sieve analysis, hygroscopic moisture, hydrometer test, fine sieve analysis, and calculations.

American Assn. of State Highway Officials, T89-42. Standard Methods of Determining the Liquid Limit of Soils. The liquid limit of a soil is that water content at which the soil passes from a plastic to a liquid state. Gives apparatus, mechanical method, hand method, and check or referree tests.

American Assn. of State Highway Officials, T90-42. Standard Methods of Determining the Plastic Limit of Soils. The plastic limit of a soil is the lowest water content at which the soil becomes plastic. Gives apparatus, sample, procedure, and calculations.

American Assn. of State Highway Officials, T91-42. Standard Methods of Calculating the Plasticity Index of Soils. The plasticity index of a soil is the numerical difference between its liquid limit and its plastic limit. Gives calculation and report.

American Assn. of State Highway Officials, T92-42. Standard Methods of Determining the Shrinkage factors of Soils. This procedure furnishes data from which the following soil characteristics may be calculated—(A) shrinkage limit, (B) shrinkage ratio, (C) volumetric change, (D) lineal shrinkage. Gives determination of the volumetric shrinkage, calculation of the shrinkage limit, calculation of the volumetric change, and calculation of the lineal shrinkage.

American Assn. of State Highway Officials, T93-42. Standard Methods of Determining the Field Moisture Equivalent of Soils. The field moisture equivalent of a soil is the minimum water content at which a drop of water placed on a smooth surface of the soil will not be completely absorbed in 30 seconds. Gives apparatus, sample, procedure, and calculation.

American Assn of State Highway Officials, M94-42. Standard Methods of Test for Centrifuge Moisture Equivalent of Soils. The centrifuge moisture equivalent is the amount of water retained by a soil which has been first saturated with water and then subjected to a force equal to one thousand times the force of gravity for one hour. Gives apparatus, sample, number of tests, procedure, calculation, and reproducibility of results.

American Assn. of State Highway Officials, T99-38. Standard Laboratory Method of Test for the Compaction and Density of Soil. The standard density test for soil determines the weight per cubic foot under a standard compaction for varying water contents of such a range as to show the maximum dry weight per cubic foot. Gives apparatus, procedure, calculations, and moisture density relationship.

American Assn. of State Highway Officials, T100-38. Standard Method of Test for Specific Gravity of Soil. To be used for the determination of the specific gravity of soil fractions. Gives apparatus, method, and calculations.

American Assn. of State Highway Officials, T116-42. Standard Method of Test for Determination of Volume Change of Soils. This method describes the procedure to be followed in the testing of soil, soil mixed with admixtures, and any desired fraction of soil-aggregate mixture, to determine the volume change caused by the absorption or loss of water. Gives apparatus and procedure.

American Ceramic Society. Journal of A.C.S. for June 1928. Tentative Method. Sampling Clay Deposits. Method for preliminary and for extended sampling.

American Society for Testing Materials, D 420-42 T; 1942. Tentative Methods of Surveying and Sampling Soils for Highway Subgrades. Covers purpose, scope, and equipment for subgrade survey, soil profile determination, examination of soil section, for roads in service and new roads, typical survey sheets, and analysis of data.

American Society for Testing Materials, D 421-39; 1939. Method of Preparing Soil Samples for Mechanical Analysis and Determination of Subgrade Soil Constants. For samples as received from the field; requirements for preparing sample. apparatus, test samples for mechanical analysis, and for subgrade soil constants.

American Society for Testing Materials, D 422-39; 1939. Method of Mechanical Analysis of Soils. For the quantitative determination of the distribution of particle sizes in soils. Covers design and dimensions of apparatus, selection of sample, hygroscopic moisture and hydrometer tests, sieve analysis, calculations for hygroscopic moisture, coarse material, percentage of soil in suspension, diameter of soil particles in suspension, and for sieve analysis report.

American Society for Testing Materials, D 423-39; 1939. Method of Test for Liquid Limit of Soils. For determining the moisture content, expressed as a percentage of the weight of oven-dry soil, at which the soil just begins to flow when jarred. Describes liquid limit apparatus and hand method of procedure.

American Society for Testing Materials, D 424-39; 1939. Method of Test for Plastic Limit and Plasticity Index of Soils. Defines and describes apparatus, method of sampling, and procedure of test.

American Society for Testing Materials, D 425-39; 1939. Method of Test for Centrifuge Moisture Equivalent of Soils. Covers definition of term, apparatus required for test, sample prepared by A.S.T.M. Method D 421, method of procedure, and calculation of percentage.

American Society for Testing Materials, D 426-39; 1939. Method of Test for Field Moisture Equivalent of Soils. For determination of the minimum moisture content at which a drop of water placed on a smoothed surface of the soil is not immediately absorbed. Describes evaporator, selection of sample, method of adding water, and oven drying to obtain percentage of field moisture.

American Society for Testing Materials, D 427-39; 1939. Method of Test for Shrinkage Factors of Soils. For shrinkage limit, shrinkage ratio, volumetric change, lineal shrinkage, and specific gravity (approximate). Requirements for apparatus, sampling, procedure, and for calculation of factors.

American Society for Testing Materials, D 556-40T; 1940. Tentative Specifications for Materials for Stabilized Base Course. Covers the quality and size of sand-clay mixtures, gravel, stone, or slag screenings, sand, crusher-run coarse aggregate consisting of gravel, crushed stone, or slag combined with soil mortar, or any combination thereof for construction of a stabilized base course. General requirements, sieve analysis, liquid limit, plasticity index, moisture content, admixtures, and methods of testing.

American Society for Testing Materials, D 557-40T; 1940. Tentative Specifications for Materials for Stabilized Surface Course. Covers the quality and size of sand-clay mixtures, gravel, stone, or slag screenings, sand, crusher-run aggregate, or combinations thereof. Gives general requirements, sieve analysis, liquid limit, plasticity index, moisture content, admixtures, and methods of testing.

American Society for Testing Materials, D 558-44; 1944. Method of Test for Moisture-Density Relations of Soil-Cement Mixtures. For relationship between moisture content of soil-cement mixtures and resulting densities (oven-dry weight) when mixture is compacted in the laboratory, before cement hydration. Gives apparatus required, method of procedure, and calculation of moisture-density relationship.

American Society for Testing Materials, D 559-44; 1944. Method of Wetting-and-Drying Test of Compacted Soil-Cement Mixtures. For determining soil-cement losses, moisture changes, swell and shrinkage produced by repeated wetting and drying of compacted specimen. Covers apparatus required, preparation of material and molding of specimen, and outline of procedure.

American Society for Testing Materials, D 560-44; 1944. Method of Freezing-and-Thawing Test of Compacted Soil-Cement Mixtures. For determining soil-cement losses, moisture changes, swell and shrinkage produced by freezing and thawing compacted specimen. Gives apparatus required, preparation of material and molding of specimen, and outline of procedure.

American Society for Testing Materials, D 653-42 T; 1942. Tentative Definitions of Terms and Symbols Relating to Soil Mechanics.

American Society for Testing Materials, D 698-42 T; 1942. Tentative Method of Test for Moisture-Density Relations of Soils. Intended for determining the relationship between the moisture content of soils and resulting densities (oven-dry weight per cubic foot) when the soil is compacted in the laboratory.

American Society for Testing Materials, D 806-44 T; 1944. Tentative Method of Test for Cement Content of Soil-Cement Mixtures. Covers scope, apparatus, reagent, samples, procedure, and calculations.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Soils; Tentative, Sampling, preparation of sample and reagents, apparatus and test procedure for determination of moisture, loss on ignition, carbonate carbon, organic carbon, nitrogen, silica, metal oxides, calcium, magnesium, manganese, iodine, sulphur, phosphorus, potassium and sodium, nitrate nitrogen, alkali salts.

References.—Soil pavements, *see* 518.38.

599. NONMETALLIC MINERALS NOT ELSEWHERE CLASSIFIED

600-699 ORES, METALS, AND MANUFACTURES

(Except Machinery, Vehicles, and Electrical Supplies)

600-609 IRON AND STEEL

600. GENERAL ITEMS RELATING TO BOTH FERROUS AND NONFERROUS METALS

600.0 GENERAL ITEMS

American Gear Manufacturers Assn. Standard 254.03; 1944. Data Sheet—Corrosion of Ferrous Metals, Its Causes, Prevention and Removal. Gives a detailed discussion of the causes of corrosion of iron and steel, prevention of corrosion, and corrosion removal.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—Constitution of Ferrous Alloys. Covers constitution diagrams; constitution of binary alloys of iron, iron-aluminum, iron-carbon, iron-chromium, iron-copper, iron-manganese, iron-molybdenum, iron-nickel, iron-nitrogen, iron-phosphorus, iron-silicon, iron-sulphur, iron-titanium, iron-tungsten, iron-vanadium, iron-carbon-molybdenum, iron-chromium-carbon, iron-manganese-carbon, iron-nickel-aluminum alloys; alloys of iron and oxygen; and iron-nickel-chromium system.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—General Data. Covers definitions of heat treating terms, glossary of X-ray terms, tool steel trade names, corrosion and heat resisting alloys, trade names, decimal and metric equivalents of parts of an inch, interconversion table for units of energy, wire and sheet gages, weights of steel bars, temperature conversion data, pyrometric cones, Greek alphabet, specific heat of gases, and periodic arrangement of the elements.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—Processes, Methods, and Equipment—General. Covers industrial heating furnaces, liquefied petroleum gases, fuel oil, properties of refractories, pyrometry, lead baths, salt baths, quenching equipment, and quenching media.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—Properties of Iron and Iron Alloys. Covers physical and mechanical properties of iron, plastic deformation of iron, effect of cold work on the properties of iron, wrought iron, alloys of iron and nickel with low expansion coefficients, corrosion of iron and steel, critical temperatures for S.A.E. steels, iron alloys containing from 3-20 percent aluminum, high yield strength low alloy steels, properties of forgings in heavy sections, coefficients of linear expansion of S.A.E. steels, magnetically soft materials, permanent magnet alloys, creep of metals and alloys, mass influence in heat treatment, similarity in tensile properties of S.A.E. steels, the alloying elements in steels, chromium steels, stainless steel, wrought heat resisting steels, heat resisting castings, copper as an alloying element in steel, manganese as an alloying element in pearlitic steels, austenitic manganese steels, molybdenum steels, nickel as an alloying element in steel, properties of iron-nickel alloys, silicon as an alloying element in steel, tungsten as an alloying element in steel, vanadium steels, aging in iron and steel, S.A.E. steel specifications, stainless steel type number and analysis, cast iron, malleable iron, and pearlitic malleable iron.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—Shaping and Forming of Metals. Covers hot mechanical working of steel, hot die forging, hot upset machine forging, piercing of steel, extrusion of metals, forging by the blacksmith, straightening bars, shapes and tubing, flattening of mild steel sheet and strip, cold drawing steel wire, cold finished carbon steel bar and shafting, swaging, coining, roll threading and knurling, machinability of steel, abrasive wheels for grinding steel, cemented or sintered hard carbides, cutting fluids for machining, and cutting of metals.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—Structure Properties, and Technology—General. Covers crystal structure of metals, physical constants of the elements, density of alloys, heat contents, properties of metals at low temperatures, fluidity of metals, and powder metallurgy.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—Technology of Iron and Steel. Covers Bessemer process, open hearth process, basic electric melting, acid electric steel, coreless induction melting, crucible process, metals and ferro-alloys, aluminum as a deoxidizer, use of aluminum in commercial steels, ingot and pouring practice, manufacture of hot and cold rolled strip and sheet, heating steel bars for forging, large forgings, fabricating and finishing stainless steels, and forging of stainless steel.

600.1 TESTING OF METALS

American Iron and Steel Institute. Manufacturers' Standard Practice. Supplementary Information. Section—Combined Standard Steel Lists of American Iron and Steel Institute, and American Society of Automotive Engineers.

American Iron and Steel Institute. Manufacturers' Standard Practice. Supplementary Information. Section 10. Alloy Steel. Charts and tables showing Rockwell "C" hardness at distances up to 2 1/2 in. from end under standard end-quench hardenability tests for various alloy steels.

American Railway Engineering Assn., Construction and Maintenance Section, Assn. of American Railroads. Manual of Railway Engineering, 1910. Specifications for Drop Test Machine. Shall be arranged to allow a 2,000-lb tup to fall freely at least 25 ft. on the center of a rail resting on supports that can be adjusted to spans varying from 3 ft. to 4 ft. 6 in. Gives details for anvil, springs, base-plate, substructure, pedestals, leads, gage, tup, tripping head, and tongs.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—Testing of Iron and Its Alloys. Covers physical testing of tool steels, notched bar testing of steel, testing bolts and screws, analytical methods for steel, determination of oxygen, nitrogen, hydrogen, etching reagents for microscopic examination, macro etching of iron and steel, nonmetallic inclusions in steel, use of reflected polarized light, McQuaid-Ehn test, austenitic grain size, case depth measurement, magnetic testing, and the spark test.

American Society for Metals. Metals Handbook, 1939 Edition. Testing-General for Ferrous Metals. Covers hydrometers, Brinell hardness test, Rockwell hardness test, scleroscope hardness test, monotron hardness test, Vickers hardness test, microcharacter, file hardness test, hardness conversion table, Moh's scale of hardness, hardness testing at elevated temperatures, test specimens, load conversion table for testing, percentage reduction of area for tensile test specimens, fatigue testing, corrosion fatigue of metals, statistical methods for control, spectrographic analysis, metallographic polishing, photomicrography, radiography of metals, and X-ray diffraction.

American Society for Testing Materials, A34-44; 1944. Methods of Test for Magnetic Properties of Iron and Steel. Includes procedures for determining the normal induction and hysteresis, core loss, normal and incremental permeability and core loss, permeability of feebly magnetic materials, interlamination resistance, and lamination factor.

American Society for Testing Materials, A 224-41; 1941. Recommended Practice for Conducting Plant Corrosion Tests. Procedure of tests under operating conditions, but not for atmospheric or underground corrosion tests. Covers apparatus for mounting specimen, preparation of test specimen, indentification of specimen, duration of test, removal of specimen from test, cleaning and weighing specimen examination of surface, and form of report.

American Society for Testing Materials, A 255-42T; 1942. Tentative Method of End-Quench Test for Hardenability of Steel. Covers determination by the end-quench or Jominy test. Consists of water-quenching one end of a cylindrical test specimen 1 in. in diameter and measuring to what extent from the quenched end the steel hardens. Apparatus, test specimens, procedure, plotting test results, index of hardenability, and report.

American Society for Testing Materials, A 256-42T; 1942. Tentative Method of Compression Testing of Cast Iron. Compression tests of cast iron shall be made in accordance with the Tentative Methods of Compression Testing of Metallic Materials (A. S. T. M. Designation: E9), except for length and dimensions. Two classes of test specimens designated as medium-length specimens and long specimens.

American Society for Testing Materials, A 260-42T; 1942. Tentative Recommended Practice for Torsion Tests of Cast Iron. Covers the procedure for torsion tests of cast iron. Important due to its use for camshaft, crankshaft, couplings, etc.: Test specimens, procedure, and calculation.

American Society for Testing Materials, A 262-44T; 1944. Tentative Recommended Practice for Boiling Nitric Acid Test for Corrosion-Resisting Steels. A method of measuring a quality of corrosion-resisting steels, especially with regard to the effectiveness of heat treatment. Gives requirements for apparatus, nitric acid test solution, preparation of test specimens, procedure, and calculation and report.

American Society for Testing Materials, A 272-44T. Tentative Method of Magnetic Particle Testing and Inspection of Commercial Steel Castings. Covers scope, definition, applications, magnetizing apparatus, magnetic particles, preparation of surface, methods of magnetization, application of particles, demagnetization, interpretation of indications, and report.

American Society for Testing Materials, A 275-44T. Tentative Method of Magnetic Particle Testing and Inspection of Heavy Steel Forgings. Covers scope, definition, applications, magnetizing apparatus, magnetic particles, preparation of surface, methods of magnetization, application of particles, demagnetization, and interpretation of indications.

American Society for Testing Materials, B 63-36; 1936. Method of Test for Resistivity of Metallic Materials. For determining to an accuracy of 1 percent, the electrical resistivity of rolled and drawn materials; preparation of test specimen, length measurement, cross-sectional area measurement, leads, heating of specimen, and form of report.

American Society for Testing Materials, B 77-33; 1933. Method of Test for Thermoelectric Power of Electrical-Resistance Alloys. For determination of thermoelectric power of a metal compared to copper, between 0 and 100 C., for suitability for use in resistance apparatus. Includes preparation of test specimen, measurement of temperature, electromotive force, polarity of metal, and form of report.

American Society for Testing Materials, B 95-39; 1939. Method of Test for Linear Expansion of Metals. Especially for determining expansion of oxidation-resistant alloys at temperatures up to 1,000° C. Describes quartz tube type of dilatometer, accuracy of micrometers, electric furnace and controls, power and temperature measuring instruments, test specimen, calibration of furnace, standard and rapid methods of procedure, and form of report.

American Society for Testing Materials, B 106-40; 1940. Thermostat Metals. Covers procedures for testing flexitivity and electrical resistivity of thermostat metals. Covers change of curvature per unit of temperature change for unit thickness, apparatus required, test specimen, procedure, and form of report.

American Society for Testing Materials, B 110-39T; 1939. Tentative Method of Test for Dielectric Strength of Anodized Aluminum. For anodic coatings applied to aluminum and its alloys, also for measure of thickness of coating where properties are known. Requirements for high-voltage transformer, electrode, test specimens, surrounding medium, condition and position of electrodes, and application of voltage.

American Society for Testing Materials, B113-41; 1941. Method for Bend Testing of Wire (Wire for Radio Tubes and Incandescent Lamps). For evaluation of temper of round wire from 0.25 to 3.0 mm. Nature of bend test, apparatus, test specimen, and procedure.

American Society for Testing Materials, B 114-39; 1939. Method of Test for Temperature-Resistance Constants of Sheet Materials for Shunts and Precision Resistors. For determining constants of materials used in temperature range 0 to 80 C. Requirements for test specimen, terminals, manganin samples, apparatus, baths, temperature and resistance measurements, procedure, and form of report.

American Society for Testing Materials, B117-44T; 1944. Tentative Method of Salt Spray (Fog) Test. Gives scope, apparatus, test specimens, preparation of test specimens, position of specimens during test, salt solution, conditions of salt-spray chamber, continuity of test, period of test, cleaning of tested specimens, evaluation of results, and records and reports.

American Society for Testing Materials, B 118-42 T; 1942. Tentative Methods of Testing Nickel and Nickel-Alloy Wire and Ribbon for Electronic Tube Filaments. For wire or ribbon without chemical coating; method of chemical analysis, density and tensile strength requirements, test specimen, procedure, weight, resistivity, and determination of dimensions.

American Society for Testing Materials, B181-43T; 1943. Tentative Method of Test for Effect of Controlled Atmospheres Upon Alloys in Electric Furnaces. Intended for determining (a) the action of controlled atmospheres upon heat-resisting alloys such as are used for electric-heating elements and other parts in industrial furnaces intended to operate at high temperatures, (b) the temperature at which attack occurs, and (c) the effect of stress upon the nature or rate of attack. Gives requirements for apparatus, test specimens, test atmosphere, procedure, precautions, and report.

American Society for Testing Materials, B 185-43T; 1943. Tentative Method of Total Immersion Corrosion Test of Non-Ferrous Metals. Covers scope, apparatus, test solution, test specimens and their preparation, number of specimens, methods of cleaning specimens after test, duration of test, evaluation of results, report, and appendices.

American Society for Testing Materials, B 191-44 T; 1944. Tentative Method of Test for Equivalent Yield Stress of Thermostat Metals. Gives scope, equivalent yield stress, apparatus, test specimens, preparation of specimens, stabilization of specimen, procedure, calculation, and report.

American Society for Testing Materials, B 192-44 T; 1944. Tentative Method of Alternate Immersion Corrosion Test of Non-Ferrous Metals. Gives scope, apparatus, test solution, test specimens and their preparation, number of specimens, procedure, methods of cleaning specimens after test, duration of test, evaluation of results, report, and appendices.

American Society for Testing Materials, B 193-44T; 1944. Tentative Method of Test for Resistivity of Copper and Copper Alloy Electrical Conductors. Covers the procedure for determining the electrical resistivity of copper and copper-alloy strips, rods, bars, tubes, and shapes used for electrical conductors. Covers resistivity, apparatus, test specimens, procedure, temperature correction, and explanatory notes.

American Society for Testing Materials, E 2-44T; 1944. Tentative Methods of Preparation of Micrographs of Metals and Alloys (including Recommended Practice for Photography as Applied to Metallography). For the examination and photography of ferrous and nonferrous metals and alloys. Gives standard magnifications, reproduction of micrographs, lenses, directions for use of lens combinations, definition of grain, measurement of grain size, numerical expression of grain size, grain size determination of steels, use of grain size in specifications, and recommended practice for photography as applied to metallography.

American Society for Testing Materials, E 3-44T; 1944. Tentative Methods of Preparation of Metallographic Specimens. To reveal constituents and structure of metals and their alloys by means of the miscroscope. Includes selection, size, cutting, cleaning, mounting, polishing, advantages, and apparatus for metallographic specimens. Gives metallographic procedures for aluminum and its alloys, copper and its alloys, iron and steel, lead and its alloys, magnesium and its alloys, nickel and its alloys, precious metals, tin and its alloys, and zinc and its alloys.

American Society for Testing Materials, E 4-36; 1936. American Association of State Highway Officials, T67-42. Methods of Verification of Testing Machines. Includes definitions, methods of verifying machines that measure load by standard weights, by proving levers, by elastic calibration device, and by comparison method; test specimen, procedure, permissible variations, interval between verifications and reports.

American Society for Testing Materials, E 6-36; 1936. Definitions of Terms Relating to Methods of Testing. Covers stress, strain, elastic limit, field strength, tensile strength, compressive strength, and modulus of elasticity.

American Society for Testing Materials, E 7-27; 1927. Definitions of Terms Relating to Metallography. Defines alloy, alpha brass, etching reagent, grain. macrograph, metallography, metal, etc.

American Society for Testing Materials, E 8-42; 1942. American Assn. of State Highway Officials, T68. Methods of Tension Testing of Metallic Materials. Covers the apparatus, test specimen, the outline of method of procedure. Includes cast iron, malleable iron, die castings, rod and wire, tubes, welded joints, gripping devices, speed of testing, and definitions.

American Society for Testing Materials, E 9-33 T; 1933. American Assn. of State Highway Officials, T 69-42. Tentative Methods of Compression Testing of Metallic Materials. For calibration of testing machine by A.S.T.M. method E4, speed of operating, preparation of test specimen, measurement of specimen, bearing blocks, method of procedure for determination of proportional limit, elastic limit, yield strength, yield point, compressive strength, and stress-strain diagrams.

American Society for Testing Materials, E 10-27; 1927. American Assn. of State Highway Officials, T70-42. Method of Test for Brinell Hardness of Metallic Materials. For determination of hardness by measurement of impression in surface of metal, using a 10 mm. ball and 500 and 3,000 kg. loads. Includes table of Brinell hardness numbers, description of apparatus, specimen, and test procedure.

American Society for Testing Materials, E 12-27; 1927. American Assn. of State Highway Officials, M 132-42. Definitions of Terms Relating to Specific Gravity. Defines absolute specific gravity of solids and liquids, specific gravity, apparent specific gravity of solids, and bulk specific gravity of solids.

American Society for Testing Materials, E 14-33; 1933. American Standards Assn. Z30.2-1936. Recommended Practice for Thermal Analysis of Steel. For determining temperature at which physical changes accompanied by abrupt change in heat content occur in metals. Furnace, temperature, and timing apparatus, method of procedure using inverse-rate method, and differential method, precautions, and form of report.

American Society for Testing Materials, E 15-39T; 1939. Tentative Methods of Radiographic Testing of Metal Castings. To reveal by photographic means the internal quality of material under examination. For use in foundry development and final inspection; description of X-ray apparatus, gamma-ray apparatus, radiographic technique and procedure.

American Society for Testing Materials, E 16-39; 1939. American Assn. of State Highway Officials, T 118-42. Method of Bend Testing for Ductility of Metals. For testing of welds primarily by free bending with measurement of the fiber elongation. Preparation of specimen, starting and closing the bend, measurement of fiber elongation, and reproducibility of results.

American Society for Testing Materials, E 18-42; 1942. American Assn. of State Highway Officials, T 80 and T 124. Methods of Test for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials. For use in thin strip or sheet material, nitrided or lightly carburized pieces, finished pieces on which large test marks are undesirable, areas near edges, extremely small parts, etc. Employs lighter minor and major loads, and more sensitive depth-measuring system; method of procedure, calibration of test blocks, and hardness scales.

American Society for Testing Materials, E 21-43; 1943. Recommended Practice for Short-Time Elevated-Temperature Tension Tests of Metallic Materials. For tests above atmospheric temperatures and up to 2,000 F. Gives requirements for selection of metals for test, test specimens, tension test apparatus, furnace and heating, temperature measuring apparatus, temperature survey of furnace, temperature control, room temperature, temperature equilibrium, strain measurement, procedure, and recording and reporting data.

American Society for Testing Materials, E 22-41; 1941. Recommended Practice for Conducting Long-Time High-Temperature Tension Tests of Metallic Materials. Covers the determination of the amount of extension of metallic materials due to the combined effects of temperature, tensile stress, and time. Possibilities and limitations, fundamental measurements, test specimens, loading; temperature measurement, control, and variation; extension of measurement, conditions of test, plotting results, form of reporting results, and precautions necessary in applying result.

American Society for Testing Materials, E 23-41T; 1941. Tentative Methods of Impact Testing of Metallic Materials. Intended for comparison of the brittleness and notch sensitivity of metals. The usual test consists of the determination of the energy absorbed in breaking a notched specimen by a single blow. The tests are based on the assumption that resistance to shock and notch effects depends upon the ability of materials to equalize dangerously concentrated stresses by plastic deformation without sudden failure. Mechanics of the test, types of test, types of specimens, apparatus, procedure, calibration, pendulum type machines, experimental procedure, and inspection and precautions for pendulum machines.

American Society for Testing Materials, E 30-42; 1942. Methods of Chemical Analysis of Steel, Cast Iron, Open-Hearth Iron, and Wrought Iron. For use in referee analyses. General instructions and precautions; sampling rolled and forged steel products, pig iron, gray-iron castings, malleable iron, and wrought iron; and methods of analysis—total carbon by the direct combustion method, manganese by the bismuthate method (absence of cobalt), manganese by the persulfate method (presence of cobalt), phosphorus by the molybdate-magnesia method, phosphorus by the alkalimetric method, sulfur by the gravimetric method, sulfur by the evolution method, silicon by the sulfuric acid method, silicon by the perchloric acid method, copper by the electrolytic or gravimetric method. copper by the thiosulfate-iodide method, nickel by the dimethylglyoxime method, nickel by the cyanide titration method, chromium by the persulfate oxidation method, vanadium by the electrolytic separation method, vanadium by reduction with ferrous sulfate and titration with permanganate, molybdenum by the alphabenzoinoxime method, molybdenum by precipitation as sulfide and weighing as oxide, molybdenum by the colorimetric method, cobalt by the zinc oxide-alpha-nitrose-beta-naphthol method, titanium by the cupferron-colorimetric method, and zirconium by the cupferron-phosphate method.

American Society for Testing Materials, E 43-42T; 1942. Tentative Recommended Practice for Indentification of Crystalline Materials by the Hanawalt X-Ray Diffraction Method. This method requires a knowledge of the interplanar spacings in the crystal corresponding to the three most intense lines in the X-ray diffraction pattern of each of the crystal components of the unknown specimen. Advantages and limitations, preparation of test specimens, X-radiation, position of film, photographic films, intensifying screens, measurement of lines on films, interpretation of data, alternative methods, and safety precautions.

American Society for Testing Materials, E 45-42 T; 1942. Tentative Recommended Practice for Determining the Inclusion Content of Steel. Covers determining the inclusion content of steel by a magnetic powder method and two miscroscopic methods. Test specimens, preparation of specimen, procedure, and expression of results.

National District Heating Assn. Proposed Tentative Method for Measurement of Relative Corrosion

Rates—N. D. H. A. Method, 1945. Provides a simple and rapid means for measuring the relative corrosivity of aqueous solutions and of comparing the corrosion resisitivity of different metals when exposed to such environments. Applicable to the making of measurements in municipal water supplies, industrial processes, pilot plant experiments, and laboratory studies, where waters relatively free of suspended materials, at temperatures below about 400°F. and at flow rates below about 5 ft./sec. are encountered. Gives requirements for apparatus; fabrication of frame, helical coils, and couplings; assembling a tester, criteria for installing a tester, period of exposure, cleaning of test specimens, calculation of average corrosion rates, table showing conversion factors and other pertinent data for materials commonly used in water lines, interpretation of data, and drawings.

Society of Automotive Engineers, Aeronautical Material Specifications 2601B, 2602A, 2604B, 2605A, 2606B, and 2607A; 1944; and 2616, 2620, and 2525, 1940. Pressure Testing—10 lb. per sq.in., 25 lb. per sq.in., 40 lb. per sq.in., 55 lb. per sq.in., 70 lb. per sq.in., 100 lb. per sq.in., 200 lb. per sq.in. (hydraulic), 1,000 lb. per sq.in. (hydraulic), and 2,500 lb. per sq.in. (hydraulic). To test the strength of and detect leaks in parts where applicable. Includes details for procedures and dispositions.

Society of Automotive Engineers. Aeronautical Material Specification 2640A; 1944. Magnetic Inspection. To detect the presence of small grinding or quenching cracks, seams, nonmetallic inclusions, and other defects on and immediately below the surfaces, in magnetizable materials. Gives requirements for application, wet process, dry process, procedure, marking, disposition, and check of equipment and procedure. Similar Specification: Army-Navy Aeronautical AN-QQ-M-181.

Society of Automotive Engineers. 1944 Handbook. Section 3—Processed Materials. SAE Standard Steels, The steel compositions included in this standard are considered adequate for practically all parts made of ferrous materials that are necessary for the production of automotive apparatus, and include grades that have been found commercially available and technically adequate for the service required of such parts. Includes general instructions, explanation of SAE numbering system, chemical compositions, methods of sampling for check analysis, method of determining hardenability, grain size charts for classification of steel, magnaflux testing, determination of inclusions, general characteristics and heat treatments, tension test specimens, physical properties, hardness tests, and definition of heat treating terms.

U. S. Gov., Army Air Forces Specification, 20027B; 1944. Certification Procedure for the Certification of Magnetic Inspection Operators, Inspectors, and Supervisors.

U. S. Gov., Army-Navy Aeronautical Specification, AN-I-26; 1944. Inspection; Radiographic.

U. S. Gov., Army-Navy Aeronautical Specification, AN-I-30; 1945. Inspection; Fluorescent Penetrant Method of.

U. S. Gov., Army-Navy Aeronautical Specification, AN-I-31; 1945. Inspection Equipment; Horizontal Magnetic Particle.

U. S. Gov., Army-Navy Aeronautical Specification, AN-QQ-M-188-3; 1943. Metals; Radiographic Inspection of (Process and Application).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C409; 1936. Production, Heat Treatment, and Properties of Iron Alloys. This circular describes very briefly the reduction or iron ore, the production and properties of cast irons, the production and fabrication of steels, and also discusses the fundamental principles upon which the heat treatment of steel is based. There are also included brief discussions of the equipment used in heat-treatment processes and the major types and chief characteristic properties of alloy steels.

U. S. Gov., Federal Specification QQ-M-151a; 1936. Amendment 2; 1944. Metals; General Specification for Inspection of. Covers requirements which are common to all detail Federal Specifications for metals unless specifically excepted in the detail specification. It does not describe the material or article but provides means for determining whether the material or article conforms to the detail requirements. Individual requirements for the material or article are given in the detail specification.

U. S. Gov., Navy Dept. General Specifications for Inspection of Materials, 1941. Appendix II, Metals, Part A, Definitions and Test, 1941; Appendix II, Metals, Part B, Section 1, Methods of Analysis of Aluminum and Aluminum Alloys, 1936; Appendix II, Metals, Part D, Photomicrographic Standards, Section 1, Photomicrographic Standards for Steel Forgings, 1938; Appendix II, Metals, Part F, Radiography, Section F-1, Definitions and Radiographic Requirements, 1938; Appendix IV, Lumber and Timber (Manufacture, Kiln-Drying, Grading, Inspection, and Shipping), 1941; Appendix VII, Welding, Part A, Section A-2, Symbols for Arc, Gas, and Resistance Welding With Instructions for Use, 1941; Appendix VII, Welding, Part D, Section D-1, General Qualifications of Welding Processes, 1938; Appendix VII, Welding, Part E, Section E-1, Qualification Tests for Metal Arc Welders, 1938; Appendix VII, Welding, Part E, Section E-2, Qualification Tests for Gas Welders, 1939; and Appendix VII, Welding, Part G, Section G-1, General Qualification of Equipment, 1938.

References.—Other test methods, *see* specifications under individual commodities. Proving rings for calibrating testing machines, *see* 919.9.

600.2 CLASSIFICATION OF METALS

American Society for Testing Materials, E 19-39T; 1939. Tentative Classification of Austenite Grain Size in Steels. Comprises two sets of charts, one for idealized form of austenite grain sizes, the other a series of photo-micrographs found in the carburized case in a carburizing (McQuaid-Ehn) test. Method of revealing grain size, comparison of grain size, and explanatory notes.

American Society for Testing Materials, E 48-43T; 1943. Tentative Hardness Conversion Tables for Steel. (Relationship Between Diamond Pyramid Hardness, Rockwell Hardness, and Brinell Hardness.) Presents data on the relationship among diamond pyramid hardness, Rockwell hardness, Superficial Rockwell hardness, and Brinell hardness of steel. Covers hardness determinations use of conversion tables, and gives tables for hardness conversion numbers for steel.

National Assn. of Waste Material Dealers, Inc. Standard Classification for Old Metals. Circular 0; 1940. Number and code word for each metal waste material, with requirements for composition, limitations on maximum dimensions, permissible foreign matter, and conditions for delivery. Includes brass, copper, pewter, zinc, tin, lead, aluminum, nickel, stainless steel, and babbitt products.

Society of Automotive Engineers. 1942 Handbook, Section 3—Processed Materials. SAE Standard Steels. The steel compositions included in this standard are considered adequate for practically all parts made of ferrous materials that are necessary for the production of automotive apparatus, and include grades that have been found commercially available and technically adequate for the service required of such parts. Includes general instructions, explanation of SAE numbering system, chemical compositions, methods of sampling for check analysis, method of determining hardenability, grain size charts for classification of steel, magnaflux testing, determination of inclusions, general characteristics and heat treatments, tension test specimens, physical properties, hardness tests, and definition of heat treating terms.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R-58-36; 1936. Classification of Iron and Steel Scrap. This recommendation establishes various standard classes and grades of scrap under the general classes of scrap for blast furnaces, for basic open-hearth furnaces, low phosphorus and low sulphur scrap for acid open-hearth furnaces, scrap for electric furnaces, for gray iron foundry practice, for Bessemer converters, and for miscellaneous purposes. Sponsored by the National Assn. of Purchasing Agents and the National Assn. of Waste Material Dealers.

U. S. Gov., Navy Dept. Specification 46M4e; 1943. Metal; Nonferrous (Composition F). For articles to be brazed.

600.3 COATING OF METALS

American Assn. of State Highway Officials, T65-42. Standard Methods of Test for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles. Gives scope; shop weighing method, spot test methods, hydrochlorid acid antimony chloride method, sulfuric acid method, and other alternate methods for galvanized sheets; stripping test and hydrochloric acid antimony chloride method for galvanized wire; and appendix.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specification for Hot-Dipped Coated (Galvanized) Products, CS-1-36; 1936. Cover the protective zinc coatings on various iron and steel articles galvanized. Include chemical and physical properties, tests, workmanship and finish, and inspection and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Malleable and Cast Iron; Castings, Fittings, Etc. CS-2-36; 1936. Cover the protective zinc coatings on various articles made out of malleable and cast iron. Zinc used for galvanizing shall conform to A.S.T.M. standard specification B6 for slab zinc. Gives requirements as to weight of coating, uniformity of coating, physical properties and tests, workmanship and finish, packing and marking, inspection, sampling, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Bolts and Nuts, Lag Screws, Washers, Pole-Line Hardware, Etc., CS-3-36; 1936. Cover zinc coatings applied by the hot-dip process on hardware and fastenings, such as builders hardware, pole-line hardware, hardware for farm inplements, bolts, nuts, screws, nails, rivets, awning pulleys, etc. Zinc used for galvanizing shall conform to A.S.T.M. standard specification B6 for slab zinc. Contains requirements as to weight of coating, weight of coating test, uniformity of coating, physical properties and tests, workmanship and finish, inspection, sampling, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Turnbuckles, Etc., CS-4-36; 1936. This specification deals primarily with the requirements to be met in hot-dip galvanizing turnbuckles. It deals with various features of the galvanizing bath, zinc used for the coating material, the quality of the zinc coating on the turnbuckles, and the requirements to be met as to finish, etc.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Range Boilers, Tanks, Etc., CS-5-36; 1936. Specifications cover the protective zinc coatings on various sizes of range boilers and tanks, tanks for water heaters, and various tanks of a similar kind, and for more or less of the same purpose. Requirements as to chemical properties, physical properties and tests, workmanship and finish, inspection and rejection, and storing and shipping.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Chain-Link Fence; Wire Fabric; Wire Products, Etc., CS-6-36; 1936. These specifications cover zinc-coated chain-link fence fabric, galvanized after weaving, in which the individual pickets are helically wound and interwoven in the form of a continuous link fabric without knots or ties. Requirements as to manufacture, sampling, weight and uniformity of coating, packing and marking, and inspection and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Light Steel Boxes and Containers, Cans, Etc., Made Out of Light Sheet Iron, CS-7-36; 1936. These specifications apply to the hot-dip galvanizing of various kinds and types of steel boxes and containers that come to the job galvanizer for coating. They refer to all kinds of articles fabricated out of light steel sheets whether in the form of a container, or otherwise

Requirements as to weight of coating, uniformity of coating, workmanship, finish, packing, marking, inspection, and rejection are given.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Pipe, CS-8-36; 1936. Pipe under these specifications is intended for ordinary uses such as low-pressure service in steam, water, and gas lines. Galvanized pipe relative to the base metal shall be made and tested in accordance with A.S.T.M. specification A53 and the pipe shall be galvanized and the coating tested in accordance with A.S.T.M. specification A120. Gives requirements as to weight of coating, workmanship and finish, inspection, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Refrigerator Coils and Like Articles Made of Pipe, CS-9-36; 1936. This specification applies to all pipe coils of various types used in refrigerators. Gives requirements as to process of galvanizing, weight of coating, workmanship and finish, inspection, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Gratings, Grills, and Like Articles, CS-10-36; 1936. Gives requirements as to the grade of zinc to be used, method of galvanizing, weight of coating, physical properties and tests, workmanship, finish, inspection, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Hoops and Bands, Strip Steel, Etc., CS-11-36; 1936. These specifications are for hoops and bands, and steel strip or like articles of iron and steel that are zinc coated. It also covers flatnailless, steel, box strapping, etc., that are galvanized. Gives requirements as to process of galvanizing, zinc coating, bending, resistance to corrosion, and methods of inspection and test.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Chain, CS-12-36; 1936. Cover hot-dip galvanizing of iron and steel chain and like articles. Gives requirements as to condition of base metal, zinc, process of galvanizing, zinc coatings, weight of coating test, weight of coating test after galvanizing, tests, inspection, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Large Smokestacks and Like Articles, CS-13-36; 1936. These specifications apply to very large articles such as smokestacks for ships, or factories, very large sheet steel or plate steel boxes. Give requirements as to base metal, grade of zinc, process of galvanizing, zinc coating, weight of coating, weight of coating test, uniformity of coating, workmanship, finish, inspection, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Very Small Articles—Rivets, Nails, Tacks, Etc., CS-14-36; 1936. Contains requirements as to base metal, grade of zinc, process of galvanizing, zinc coating, weight of coating, weight of coating test, uniformity of coating, physical properties, tests, workmanship, finish, inspection, sampling, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Wiped Articles—Awning Iron, Etc., CS-15-36; 1936. These specifications are for wiped articles, such articles being typically represented by awning iron. Cover a number of different kinds of articles that may be wiped, for example half round, wide flats, small flat strip steel, small angles, etc. Requirements as to base metal, grade of zinc, galvanizing, zinc coating, bending, weight of coating, physical properties and tests, inspection, sampling, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Cans, Metal Ware, Hollow Ware, and Like Articles, CS-16-36; 1936. This set of specifications requires that all metal ware articles, all cans, and all items included are to be hot-dip galvanized after fabrication, hand-dipped, and not any articles fabricated into these articles from galvanized sheets. Requirements as to base metal, zinc coating, weight of coating, stripping test, inspection, sampling, and rejection.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specification for Hot Dipped Zinc Coated (Galvanized) Steel Window Sash, CS-17-38; 1938. The scope of this specification covers the required standard materials, statements regarding the weight of coating, allowances for zinc coating, tests for zinc coating, finish, defects, inspection, and other features of importance.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Hot-Dip Zinc-Coated (Galvanized) Steel Highway Sign Posts, CS-18-38; 1938. The scope of this specification covers the required standard materials, statement regarding the weight of coating, tests for zinc coating, finish defects, inspection, and other features.

American Hot-Dip Galvanizers Assn., Inc. Tentative Standard Specifications for Method of Test for Uniformity of Coating by the Copper Sulphate Dip Test (Preece Test) on Zinc-Coated (Hot-Dip Galvanized) Steel Castings and Forgings, Gray Iron and Malleable Iron Castings, CS-19-39; 1939. This method covers the procedure by which the Preece test shall be performed to determine the uniformity of the zinc coating (galvanizing) on steel castings and forgings, gray iron and malleable iron castings.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel—No. 4; 1941. Possible Substitutes for Zinc Coatings on Steel. Covers lead base coatings, unavailable metals or those of restricted availability, nonmetallic inorganic coatings, organic coatings, surface preparation of sheets, light metallic treatments, chemical treatment on black sheets, nontreatment on black sheets, paints for treated and untreated sheets, coatings for underground service, coatings subject to atmospheric exposure, coatings for inside of pipe, nonmetallic coatings for pipe, metal ware, and wire products.

American Society for Metals. Metals Handbook, 1939 Edition. Surface Treatments and Cladding of Ferrous Metals. Covers electroplated metal coatings, industrial or "hard" chromium plating, tinning of steel, zinc coatings, sprayed metal coatings, coloring steel, cleaning of metals, cleaning metals with alkaline solutions, pickling iron and steel products, electrolytic pickling of iron and steel, cleaning metals by blast cleaning process, tumbling, rolling, and barrel burnishing, slushing compounds, composite steels, stainless clad steels, nickel and nickel alloy clad steel, lead coatings, copper covered steel wire, and facing or surfacing by welding.

American Society for Testing Materials, A 90-39; 1939. Methods of Test for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles. Covers procedures for determining weight of coating; for sheets by shop weighing and shop test methods using (standard) hydrochloric acid-anitmony chloride, or (alternate) sulfuric acid, or (alternate) basic lead acetate, sulfuric acid-permanganate, thermal, and evolution of hydrogen methods. Includes stripping test for galvanized wire, and appendix for determination of iron in zinc coatings.

American Society for Testing Materials, A 123-33; 1933. American Assn. of State Highway Officials, M111-35. American Standards Assn. G8.1-1933. Zinc (Hot-Galvanized) Coatings on Structural Steel Shapes, Plates, and Bars, and Their Products. For dipping articles in molten bath of zinc, minimum impurities in zinc, test samples, embrittlement of material, weight of coating, adherence and uniformity of coating.

American Society for Testing Materials, A 143-35; 1935. Recommended Practice for Safeguarding Against Embrittlement of Hot-Galvanized Structural Steel Products and Procedure for Detecting Embrittlement. For preventing and determining loss of ductility, factors tending to cause embrittlement; steels to use, cold working, and procedure for galvanized angle test.

American Society for Testing Materials, A 153-42T; 1942. Tentative Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware. Includes builders hardware, bolts, screws, rivets, pulleys, etc., but not marine hardware nor articles formed after coating. Gives requirements for zinc, weight of coating, uniformity and adherence of coating, and inspection.

American Society for Testing Materials, A 164-40T; 1940. Tentative Specifications for Electrodeposited Coatings of Zinc on Steel. Includes three types of coatings to withstand corrosion; requirements for manufacture, thickness of coating, significant surfaces, selection of samples, test for thickness of coating, and time required for plating. Prepared jointly by the American Electro-Platers' Society, the National Bureau of Standards, and the A. S. T. M.

American Society for Testing Materials, A 165-40T; 1940. Tentative Specifications for Electrodeposited Coatings of Cadmium on Steel. Includes three types of coatings, cleaning of steel, minimum thickness of coatings, tests for thickness, and finished uniform dull or bright appearance of coatings. Prepared jointly by the American Electro-Platers' Society, the National Bureau of Standards, and the A. S. T. M.

American Society for Testing Materials, A 166-41T; 1941. Tentative Specifications for Electrodeposited Coatings of Nickel and Chromium on Steel. For use for both appearance and protection against corrosion; includes three types of coatings, requirements for manufacture, thickness of coatings, optional copper coating, significant surfaces, tests of coatings, and time required for plating. Prepared jointly by the American Electro-Platers' Society, the National Bureau of Standards, and the A. S. T. M.

American Society for Testing Materials, A 219-40T; 1940. Tentative Methods of Test for Local Thickness of Electrodeposited Coatings. For coatings of nickel, copper, zinc, or cadmium by microscopic test, and for coatings of chromium by spot test. Method of microscopic test procedure, test specimen, etching reagents, and mounting specimens; for spot test specimen, reagent, procedure, time required, and calculations. Prepared jointly by the American Electro-Platers' Society, the National Bureau of Standards, and the A. S. T. M.

American Society for Testing Materials, A 239-41; 1941. American Assn. of State Highway Officials, T 66-42. Method of Test for Uniformity of Coating by the Preece Test, Copper Sulfate Dip, on Zinc-Coated, Galvanized, Iron or Steel Articles. For determination of thinnest portions of coating, but not for relative weight of coatings. Includes solution, test specimen, outline of procedure, end point, and applications of method.

American Society for Testing Materials, A 263-44T; 1944. A. S. M. E. Boiler Construction Code Specification, SA-263. Tentative Specifications for Corrosion-Resisting Chromium Steel Clad Plate, Sheet, and Strip. For carbon steel or low-alloy steel base to which is integrally and continuously bonded on one or both sides a layer of corrosion-resisting chromium steel. Gives requirements for process, heat treatment, thickness of cladding metal, chemical composition, check analysis, physical properties, test specimens, number of tests, permissible variations in thickness and weight, finish, repair of minor defects, marking, inspection, and rejection.

American Society for Testing Materials, A 264-44T; 1944. A. S. M. E. Boiler Construction Code Specification, SA-264. Tentative Specifications for Corrosion-Resisting Chromium-Nickel Steel Clad Plate, Sheet, and Strip. For carbon steel or low-alloy steel base to which is integrally and continuously bonded on one or both sides a layer of corrosion-resisting chromium-nickel steel. Gives requirements for process, heat treatment, thickness of cladding metal, chemical composition, check analysis, physical properties, test specimens, number of tests, permissible variations in thickness and weight, finish, repair of minor defects, marking, inspection, and rejection.

American Society for Testing Materials, A 265-43T; 1943. A. S. M. E. Boiler Construction Code Specification, SA-265. Tentative Specifications for Nickel and Nickel-Base Alloy Clad Steel Plate. For a carbon steel or low-alloy steel base to which is integrally and continuously bonded on one or both sides a layer of nickel or nickel-base alloy. Gives requirements for process, heat treatment, thickness of cladding metal, chemical composition, check analysis, physical properties, test specimens, number of tests, permissible variations in thickness and weight, finish, repair of minor defects, marking, inspection, and rejection.

American Society for Testing Materials, A 267-44T; 1944. Tentative Specifications for Lead Coating (Hot-Dip) on Iron or Steel Hardware. Gives scope, lead, weight of coating, weight of coating test, acetic acid test for weight of coating, continuity of coating, ferroxyl test for continuity of coating, microscopic test for local thickness of lead coating, workmanship and finish, packing, inspection and rejection.

American Society for Testing Materials, B 136-40T; 1940. Tentative Method of Test for Sealing of Anodically Coated Aluminum. For test for nonadsorption of coloring matter, or non-staining in service. Special solution required and method of procedure.

American Society for Testing Materials, B 137-40T; 1940. Tentative Method of Test for Weight of Coating on Anodically Coated Aluminum. For anodically oxidized aluminum and its alloys and approximate measure of thickness of coating. Reagent necessary, test specimen, and outline of procedure.

American Society for Testing Materials, B 141-41T; 1941. Tentative Specifications for Electrodeposited Coatings of Nickel and Chromium on Copper and Copper-Base Alloys. Cover Requirements for electroplated (three types of) coatings on copper articles, including a final coating of nickel or chromium where both appearance and protection against corrosion of the base metal are important. Manufacture, thickness of coatings, significant surfaces, selection of samples, number of tests, tests for thickness of coatings, acceptance and rejection, retest, costs of tests, and time required for plating. Prepared jointly by American Electro-Platers' Society, National Bureau of Standards, and American Society for Testing Materials.

American Society for Testing Materials, B 142-41T; 1941. Tentative Specifications for Electrodeposited Coatings of Nickel and Chromium on Zinc and Zinc-Base Alloys. Cover requirements for electroplated (three types of) coatings on zinc articles, including a final coating of nickel or chromium where both appearance and protection against corrosion of the base metal are important. Manufacture, thickness and continuity of coating, significant surfaces, selection of samples, number of tests, test for thickness of coating, salt spray test for continuity of coating, acceptance and rejection, retest, cost of tests, and time required for plating. Prepared jointly by American Electro-Platers' Society, National Bureau of Standards, and American Society for Testing Materials.

American Society for Testing Materials, B 177-43T; 1943. Tentative Recommended Practice for Chromium Plating on Steel for Engineering Use. Intended as an aid to such platers and engineers who, although familiar with ordinary electroplating practice, are confronted with new problems inherent in the electrodeposition of chromium for engineering use. Covers nature of steel, cleaning, etching, racks and anodes, chromium plating, treatments of chromium coating, repair of chromium coating, and methods of testing.

American Society for Testing Materials, B 183-43T; 1943. Tentative Recommended Practice for Preparation of Low-Carbon Steel for Electroplating. Intended as an aid to platers in setting up a suitable cleaning cycle preparatory electroplating of low-carbon steel. Covers nature of cleaning and gives requirements for nature of cleaning, cleaning solutions and apparatus, procedure for racked parts, variations in procedure for parts to be racked, procedure for parts in bulk, variations in procedure for parts in bulk, and tests for efficiency of the preparatory cleaning.

American Society for Testing Materials, E S-31; 1943. Emergency Specifications for Electrodeposited Coatings of Lead on Steel. Covers requirements for Electroplated lead coatings on steel articles that are required to withstand corrosion and includes six types. Gives manufacture, thickness of coatings, continuity of coatings, significant surfaces, selection of samples, number of tests, tests for thickness of coating, salt spray test for continuity of coating, acceptance and rejection, retest, cost of tests, and appendices.

American Transit Assn. Specifications for Galvanizing or Sherardizing on Iron and Steel, D6-41; 1941. Lists certain specifications of the American Standards Assn. or the American Society for Testing Materials which should be used for galvanizing under the materials listed.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Division, Signal Section. Manual of Recommended Practice, 1943. Specification for Metal Plating. Recommends specifications for plating of metals meeting the requirements and tests of the A.S.T.M. Covers steel coatings as follows: Zinc, A 164; cadmium, A 165; and nickel and chromium, A 166. Also covers electro-deposited coatings as follows: Nickel and chromium on copper and copper-base alloys, B 141; and nickel and chromium on zinc and zinc-base alloys, B 142.

Society of Automotive Engineers. Aeronautical Material Specification 2400C; 1944. Cadmium Plating. The purpose of the specification is to protect parts against corrosion. Gives requirements for preparation, procedure, thickness, thickness determination, quality, application, and rejections. Similar specification: Army-Navy Aeronautical AN-QQ-P-421.

Society of Automotive Engineers. Aeronautical Material Specification 2402A; 1944. Zinc Plating. The purpose of this specification is to protect metal parts against corrosion. Covers preparations, procedure, thickness, thickness determination, quality, application, and rejections. Similar specification, Army-Navy Aeronautical AN-P-32.

Society of Automotive Engineers. Aeronautical Material Specification 2470A; 1942. Protective Treatments for Aluminum Base Alloys. The purpose of this specification is to increase corrosion resistance and provide surfaces which will insure maximum paint adherence. Describes process, preparation of material, precautions to be observed, and application to aluminum alloy parts.

Society of Automotive Engineers. Aeronautical Material Specification 2475; 1940. Protective Treatments for Magnesium Base Alloys. The purpose of this specification is to increase corrosion resistance and provide surfaces which will insure maximum paint adherence. Describes both dichromate and chrome pickle processes to be used, preparation of the material, precautions to be observed, and application of the processes to the materials.

Society of Automotive Engineers. Aeronautical Material Specification 2503; 1940. Black Finishing, Low Baking. For parts which do not exceed a temperature of

350°F. Gives requirements for process, preparation, priming coat, enamel finish, and approved materials.

Society of Automotive Engineers. Aeronautical Material Specification 2510A; 1944. Engine Gray Finishing, Low Baking. For parts which do not exceed a temperature of 300°F. Gives requirements for process, preparation, priming coat, enamel finish, and approved materials.

Society of Automotive Engineers. Aeronautical Material Specification 4710; 1942. Brass Wire, Tinned. Gives requirements for composition, condition, quality, tolerances, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5033; 1942. Steel Wire; Zinc-Coated (Low-Carbon). Gives requirements for composition, condition, quality, tolerances, reports, packaging, and rejections. Similar specification: Army-Navy Aeronautical AN-QQ-W-435.

Society of Automotive Engineers. Aeronautical Material Specification 5036; 1943. Steel Sheet and Strip—Low-Carbon (Aluminum Coated). Chemical composition, condition, quality, tolerance, reports, identification, and rejection.

U. S. Gov., Army Air Forces Specification 11353; 1943. Steel; Low Carbon, Aluminum Coated, Sheet and Strip.

U. S. Gov., Army Air Forces Specification, 20020-A; 1941. Protective Coatings and Finishes for Automotive Vehicles; General Specification for.

U. S. Gov., Army Air Forces Specification, 20031-A; 1944. Process; Chromium Plating, for Aircraft Engine Cylinders.

U. S. Gov., Army Air Forces Specification, 20034; 1944. Cementing Metal to Metal, Process for.

U. S. Gov., Army Air Forces Specification, 20040; 1945. Anodizing Process. For inspection of forged aluminum alloys.

U. S. Gov., Army-Navy Aeronautical Specification, AN-M-12; 1943. Magnesium Alloy; Processes for Corrosion Protection of.

U. S. Gov., Army-Navy Aeronautical Specification, AN-P-32a; 1944. Plating; Zinc.

U. S. Gov., Army-Navy Aeronautical Specification, AN-P-34a; 1944. Plating; Nickel.

U. S. Gov., Army-Navy Aeronautical Specification, AN-P-39a-1; 1945. Plating; Chromium.

U. S. Gov., Army-Navy Aeronautical Specification, AN-P-61; 1944. Plating; Cadmium.

U. S. Gov., Army-Navy Aeronautical Specification, AN-QQ-A-696a; 1941. Anodic-Films; Corrosion-Protective (for) Aluminum Alloys.

U. S. Gov., Army-Navy Aeronautical Specification, AN-QQ-S-91; 1938. Salt-Spray-Corrosion-Test; Process for.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP1645; 1945. Effects of Polishing of Steel Upon the Protective Value of Electroplated Coatings. Various polished specimens plated with copper, nickel, and chromium of controlled thickness were exposed to the atmosphere at various locations and the extent of rusting observed at periodic inspections. Accelerated tests, such as the salt-spray, hot water, ferroxyl, and condensation tests were also made.

U. S. Gov., Federal Specification, WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes requirements for tests for thickness of electroplated coatings. Covers plated areas to be tested for average thickness of coatings; spot test for minimum thickness of chromium on brass, red metal, white metal and zinc-alloy die-castings; magnetic test for minimum thickness of nickel on brass, red metal and white metal; tests for average thickness of chromium and nickel plating on brass, red metal and white metal; test for cobalt; tests for average thickness of chromium, nickel, and copper on zinc-alloy die-castings; and microscopic tests for minimum thickness of copper and nickel on zinc-alloy die castings. Emergency Alternate Federal Specification E-WW-P-541a; 1942. (Issued by Procurement Division, Treasury Dept, U. S. Gov.). Changed requirements for metals and finishes, standard materials, and illustrations, selections, and air gaps.

U. S. Gov., Navy Dept. Specification, 46P1; 1937. Plating; Cadmium.

U. S. Gov., Navy Dept. Specification, 46P2; 1938. Plating, Zinc.

U. S. Gov., Navy Dept. Specification, 46Z3; 1944. Zinc-Coating (Hot-Dip Galvanizing).

U. S. Gov., Navy Dept. Specification, 5112(I); 1930. Inhibitors; Pickling.

U. S. Gov., Navy Dept. Specification, 5113(I); 1939. Indicator, Corrosion-Control.

U. S. Gov., U. S. Army, Army Air Forces. Specification 3-100-1; 1942. Protective Coatings and Finishes for Aircraft and Aircraft Parts, General Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-20004C; 1931. Protective Treatment for Aluminum and Aluminum Alloys.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-20007; 1935. Cleaning of Aircraft Metal Surfaces Prior to Application of Initial Protective Coating.

U. S. Gov., U. S. Army, Medical Department. Specification 10-3011; 1944. Corrosion-Resistant Treatment (for Box-Lock Stainless Steel Surgical Instruments).

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-0-2C; 1943. Finishes, Protective, for Iron and Steel Parts.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 3-124; 1926. Bronze Finish (for Metals).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-253A; 1926. Galvanizing as Applied to Signal Corps Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-254A; 1929. Tinning Test for Copper Wire as Applied to Signal Corps Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-263A; 1928. Tinning Test for Iron and Steel Wire.

References.—Nickel salts for nickel plating, *see* 839.39, ammonium chloride (sal ammoniac) for galvanizing purposes, *see* 831.4. Other metallic coating requirements and methods of test, *see* specifications under individual commodities.

600.4 DEFINITIONS OF METALS

American Society for Testing Materials, A 81-33; 1933. Definitions of Terms Relating to Wrought Iron. Defines wrought iron, bushelling, fagoting, muck bar, common iron, slab pile, box pile, refined bar iron or refined wrought-iron bars, and double-refined iron.

American Society for Testing Materials, A 127-44T; 1944. Tentative Definitions of Terms, With Symbols, Relating to Magnetic Testing. Gives table showing symbols used in magnetic testing and defines a large number of terms used in magnetic testing.

American Society for Testing Materials, E 7-27, 1927. Definitions of Terms Relating to Metallography. Defines alloy, alpha brass, etching reagent, grain, macrograph, metallography, metal, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1940. Standard Samples. Gives 41 standard samples of steel chemical standards with schedule of weights and fees. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis, for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Gives 18 standard samples of steel (spectrographic standards) with schedule of weights and fees. These samples are prepared and sold by the Bureau with a certificate of analysis, for use by industrial organizations and others, for checking the accuracy of analyses of similar steels.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Gives a descriptive list of standard samples 4f, 5h, 6e, 7c, for cast iron; 55a for ingot iron; 82 for nickel-chromium cast iron; 107 for nickel-molybdenum cast iron; 115 for nickel-chromium-copper cast iron; and 122 for cast iron (car wheel). These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis, for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

600.5 HEAT TREATMENT OF METALS

American Iron and Steel Institute. Joint Sponsor With Society of Automotive Engineers, Inc. Contributions to the Metallurgy of Steel—No. 11; 1944. Tentative Hardenability Bands. Gives grades of steel, chemical composition limits, identification, grain size, use of band limits, general requirements, and tables showing chemical composition ranges, standard permissible variations, end-quench hardenability bands, and Rockwell hardness for various tentative hardenability bands.

American Society for Metals. Metals Handbook, 1939 Edition. Ferrous Section—Case Hardening. Covers carburizing introduction, carburizing methods, mechanism of carburization, selection of carburizing steel, case depth, and heat treatment, pack carburizing, gas carburizing, liquid carburizing, cyaniding, selective carburization of steels, and nitriding.

American Society for Metals. Metals Handbook, 1939 Edition. Heat Treatment of Ferrous Metals. Covers heat treatment of metals, recrystallization, relation of design to heat treatment, principles of heat treatment of iron and steel, flame hardening, and heat treatment of carbon steels including the types of castings, gears, forgings, shafts, springs, tool steels, dies, presses, shears, taps, and molds.

American Society for Testing Materials, A 255-42T; 1942. Tentative Method of End-Quench Test for Hardenability of Steel. Covers determination by the end-quench or Jominy test. Consists of water-quenching one end of a cylindrical test specimen 1 in. in diameter and measuring to what extent from the quenched end the steel hardens. Apparatus, test specimens, procedure, plotting test results, index of hardenability, and report.

American Society for Testing Materials, E 44-43; 1943. Definition of Terms Relating to Heat Treatment of Metals. This standard is intended to be strictly a set of definitions and not a specification. Defines about fifty terms. Prepared jointly by the American Society of Metals, Society of Automotive Engineers, American Foundrymen's Assn., and American Society for Testing Materials.

International Acetylene Assn. Flame Hardening by the Oxy-Acetylene Process. Describes the nature and scope of flame-hardening, the hardness effects obtainable with several types of steels and the techniques used in hardening objects of various size and shape. Contains approximate operating data for the more common flame-hardening operations.

U. S. Gov., Army Air Forces Specification, 10085; 1942. Steels Used in Aircraft Carburizing and Nitriding, Process for.

U. S. Gov., Army-Navy Aeronautical Specification, AN-H-25-2; 1944. Heat Treatment of Magnesium Alloy Castings; Process for.

U. S. Gov., Army-Navy Aeronautical Specification, AN-QQ-H-186a; 1944. Heat Treatment of Aluminum Alloys; Process for.

U. S. Gov., Army-Navy Aeronautical Specification, AN-QQ-H-201-2; 1942. Heat-Treatment-Of-Steels (Aircraft); Process for.

References.—Other heat treatment requirements, *see* specifications under individual commodities.

600.6 PLUMBING

American Gas Assn. Requirements for House Piping and Appliance Installation, 1928. Fundamental and basic requirements stated that will insure safety and satisfactory service in installation of house piping and appliances. Recommended practice in piping, gas metering, appliance installation, and flue connections to meet requirements.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, Specifications for Buildings for Railroad Purposes; Plumbing. Gives requirements for excavation, arrangement of system, sizes and kinds of pipe and fittings, valves, pipe sleeves, soil and vent stacks, meter, pressure regulator, traps and cleanouts, pipe covering, slate compartment work, tests, gas piping, and fire protection.

American Society of Mechanical Engineers. Sponsored by American Public Health Assn. American Standards Assn., A 40.4-1942. Air Gaps in Plumbing Systems. For plumbing fixtures and all water-connected devices. Gives definitions, minimum required air gap dimensions, tanks or vats with water inlets below the floor-level rim, water closet tanks, drinking fountain nozzles, minimum air gaps for generally used plumbing fixtures, and illustrations.

American Society of Mechanical Engineers. Sponsored by American Public Health Assn. American Standards Assn., A 40.6-1943. Backflow Preventers in Plumbing Systems. For plumbing fixtures and all water-connected devices. Gives requirements, definitions, tests, and illustrations.

National Assn. of Master Plumbers of the U. S., Inc. Plumbing Code, 1933. Revised, March 1942. Includes definitions of plumbing and plumbing terms; general regulations; regulations for quality and weights of materials, joints and connections, traps and cleanouts, water supply, and distribution, quality of water supply, plumbing fixtures, hangers and supports for plumbing piping, ventilation of rooms and fixtures, drainage and venting of plumbing systems, safe and special wastes for industrial refrigerator, special conditions, tests of plumbing systems, sewage disposal and covering.

U. S. Gov., Dept. of Commerce, National Bureau of Standards BH13; 1931. Recommended Minimum Requirements for Plumbing. Recommended by building code committee for incorporation in building codes of states and cities; includes definitions of terms, regulations on slope of horizontal piping, change in direction, prohibited fittings, quality of materials in general according to ASTM specifications, requirements on minimum thickness of sheet metals, construction of joints and connections, kinds, sizes, materials, and required installation of traps, pipe cleanouts, back water valves, water supply pipes, waste stacks, vent pipes, house drains and sewers, storm drains, etc., inspection and test requirements for completed installation, recommended construction details.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS28; 1939. Backflow Prevention in Over-Rim Water Supplies. This report describes the methods used and the results obtained in the investigation of the prevention of backflow from plumbing fixtures with over-rim supply by means of air gaps between the supply opening and the highest possible liquid level in the fixture. The previous work is discussed and the data necessary for a complete understanding of the subject are presented. The treatment has been developed from the point of view of the construction of the supply fitting as well as its location with respect to the fixture. Finally, recommendations are offered in a form suitable for use in field inspection.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS58; 1940. Strength of Soft-Soldered Joints in Copper Tubing. An extended investigation was made of the strength, under tensile loading, of sleeve joints in copper tubing, with wrought-copper and cast-brass coupling, soldered with (50-50) tin-lead and (95-5) tin-antimony alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS65; 1940. Methods of Estimating Loads in Plumbing Systems. This report describes a method of estimating the demand and sewage loads for which provision should be made in designing plumbing systems in order that the service may be satisfactory. The characteristics of flow through a plumbing system and of the operation of supply valves and plumbing fixtures are described, and their influence on the method of estimating the load to be expected is discussed. The relative load-producing values of different kinds of commonly used plumbing fixtures are analyzed, and a table is developed giving relative load weights in terms of a load factor called the "fixture unit." An estimate curve developed by means of the probability function is given, and its use in conjunction with the table of fixture units is illustrated.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS66; 1940. Plumbing Manual (Report of Subcommittee on Plumbing of the Central Housing Committee on Research, Design, and Construction). A manual of recommended plumbing practice is presented by a committee composed of representatives of Federal Agencies most concerned with the subject. The committee has taken into consideration available recommendations of other bodies and results of research performed at the National Bureau of Standards. Part I consists of an introduction explaining the origin of the work. Part II contains recommendations regarding necessary sizes of piping, precautions against pollution of water supply, permissible types of venting, and other matters customarily covered in plumbing codes. Part III contains information useful in applying the recommendations, including illustrative interpretations of the specific requirements in part II. The recommendations are presented as suitable for adoption by Federal agencies engaged in actual plumbing work or in passing upon plans of structures containing plumbing.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS79; 1941. Water Distributing Systems for Buildings. This report gives information relating to the selection of pipe sizes and design of distributing systems for adequate supply of water in buildings. It contains flow charts showing the capacities of different commercial sizes of pipe in terms of friction loss in head for four degrees of roughness, depending on the pipe material and the character of water with which the pipe is used. A practical procedure is developed for the economical selection of pipe sizes for the different demands for each part, depending on the estimated demand and on the pressure available for friction loss as computed for particular service conditions. Suggested variations in the procedure provide convenient means of allowing for decrease in capacities of pipes in service.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-131. Sanitary System, Septic Tank, Etc.

U. S. Gov., Federal Housing Administration. Minimum Construction Requirements. These requirements provide a minimum standard of construction and shall apply to all new construction on which the mortgage is insured by the Federal Housing Administration. They are considered necessary to produce a well-constructed dwelling which will serve as sound security for a long-term mortgage loan. Since these requirements are essentially minimum, they are not to be built down to but form a basis from which to build up. Copies are available in the FHA insuring offices throughout the United States. Include requirements for excavation, masonry, adobe construction, structural steel and iron, lumber, wood framing, termite prevention, roof coverings, sheet metal, lathing, plastering, stucco, painting, plumbing, heating, electrical work, etc., according to geographical location and local building code requirements.

U. S. Gov., Navy Dept. Bureau of Yards and Docks. Specification 31Yb; 1943. Plumbing Systems.

References.—Plumbing fixtures, *see* 617.7.

600.7 WEIGHTS AND TOLERANCES OF IRON AND STEEL

600.8 IMPREGNATION OF METALS

American Society for Metals. Metals Handbook, 1939 Edition. Metallic Cementation. Covers aluminum impregnation, chromium impregnation, zinc impregnation, and silicon impregnation.

601. ORES, PIG IRON, AND SCRAP

601.0 GENERAL ITEMS

601.1 IRON ORE

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Iron Ore, Crescent, Sample 26; Iron Ore, Magnetite, Sample 29a; Iron Ore, Norrie, Sample 28; Iron Ore, Sibley, Sample 27b; and Manganese Ore, Sample 25b. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis, for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

References.—Chrome, manganese, and silicon ores, *see* 621.1; ferrochrome, ferromanganese, etc, *see* 621.2; screen testing of ores, *see* 601.0.

601.2 PIG IRON

601.20 General Items

American Iron and Steel Institute. Steel Products Manual. Section 1; 1941. Standard Pig Iron Compositions of the American Iron and Steel Industry and Their Grades, Chemical Compositions, and Common Use.

601.21 Charcoal Pig Iron

601.22 Coke Pig Iron

601.23 Foundry Pig Iron

American Society for Testing Materials, A 43-24; 1924. Foundry Pig Iron. Gives permissible variations from specified composition, method of sampling, chemical analysis with suggested coding of compounding elements.

U. S. Gov., Federal Specification QQ-I-676a; 1942. Iron; Pig, Foundry. Covers six classes—AX, A, BX, B, C, and D. Gives requirements for material, workmanship, and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Methods of testing and general requirements for metals, *see* 601.20, 600.1; ferrochrome, ferromanganese, etc., *see* 621.2.

601.24 Malleable Pig Iron

601.3 IRON AND STEEL SCRAP

U. S. Gov., Navy Dept. Specification, 42W2; 1943. Weights; Ballast.

References.—Classification of scrap metals, *see* 600.2.

602. CRUDE AND SEMIFINISHED IRON AND STEEL

602.1 IRON BILLETS

American Society for Testing Materials, A 73-39; 1939. Wrought-Iron Rolled or Forged Blooms and Forgings. Includes two classes, for locomotives and railroad cars, and for miscellaneous uses. Requirements for manufacture, chemical compositions, tensile properties, etch test, test specimen, workmanship, and inspection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Division. Manual of Standard and Recommended Practice, 1942. Includes Wrought Iron—Blooms and Forgings, M-307-42; 1942. For locomotives and cars, requirements as to manufacture, chemical and physical properties and tests, workmanship, finish, and marking.

National Association of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2, 1944. Iron; Wrought. Covers definition, derivation, constants, uses, forms, and substitutes.

602.2 STEEL BARS AND BILLETS

American Iron and Steel Institute. Manufacturers' Standard Practice. Supplementary Information. National Emergency Carbon Steels. Carbon Steel Semifinished Products, 1942. Gives requirements for carbon and manganese for 22 grades.

American Iron and Steel Institute. Steel Products Manual. Section 2; 1937. Revised, 1943. Carbon Steel Semifinished Products. Covers definitions, quality classifications, and manufacturing practices; standard steels and system of identification, chemical limits and ranges for nonstandard steels, and standard methods of sampling for check analysis; and glossary.

American Iron and Steel Institute. Steel Products Manual. Section 8a; 1941. Standard Methods for Packaging, Loading, and Shipping Hot-Rolled Steel Bars.

American Iron and Steel Institute. Steel Products Manual. Section 9a; 1943. Standard Packaging and Shipping Methods of Cold-Finished Bars. General provisions, packaging, boxing, paper or burlap wrapping, wrapping or shrouding, and identification.

American Society for Testing Materials, A 273-44T. Tentative Specification for Carbon-Steel Blooms, Billets and Slabs for Forgings. Covers scope, process, discard, reduction from ingot, chemical composition, ladle analysis, check analysis, finish and soundness, conditioning, permissible variations in weight, marking, inspection, rejection, and rehearing.

Society of Automotive Engineers. Aeronautical Material Specification 5060A; 1942. Carbon Steel (.13-.18 Carbon). For bars, billets, forgings, tubing, or as ordered. Gives requirements for composition, condition, quality, reports, shipments, identification, and rejections. Similar specifications: Navy 46 S 32, Class A; SAE 1015.

Society of Automotive Engineers. Aeronautical Material Specification 5070; 1942. Carbon Steel (.18-.23 Carbon). For bars, rods, billets, or forgings. Covers requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections. Similar specifications: AN-QQ-S-646, No. X1020; SAE 1022.

Society of Automotive Engineers. Aeronautical Material Specification 5080; 1942. Carbon Steel (.32-.38 Carbon). For bars, billets, forgings, or as ordered. Covers requirements for composition, condition, quality, tolerances, reports, identification, and rejections. Similar specification: SAE 1035.

U. S. Gov., Federal Specification QQ-S-671; 1941. Amendment 1; 1942. Steel: Carbon and Alloy, Bars. Covers 22 carbon steels, and 8 free-cutting steels; in 7 conditions—as rolled (hot-rolled or forged), annealed, normalized, normalized and tempered, quenched and tempered, cold-rolled or cold-drawn, and cold-rolled or cold-drawn and stress relief annealed. Gives requirements for material, manufacture, quality, and condition, condition and finish, heat treatment, chemical composition, physical properties, dimensions, and tolerances; methods of inspection and tests; requirements for packing and marking for shipment; tables of chemical requirements; and tables of permissible variations in squares, rounds, hexagons, and flats.

U. S. Gov., Navy Dept. Specification 46S4h; 1939. Steel, Carbon and Alloy: Bars, Billets, Blooms, and Slabs (for Reforging or Other Operations Before Heat Treatment).

U. S. Gov., Navy Dept. Specification 46S11a; 1938. Steel; Ingots.

U. S. Gov., Navy Dept. Specification 46S18d; 1939. Steel, Corrosion-Resisting: Bars, Rods, and Forgings (Except for Reforging).

U. S. Gov., Navy Dept. Specification 46S26a; 1943. Steel, Corrosion-Resisting: Bars and Billets (for Reforging Only).

U. S. Gov., Navy Dept. Specification 46S32a; 1939. Steel; Bars and Billets for Carburizing.

U. S. Gov., Treasury Dept., Procurement Div. 297; 1938. Steel Carbon, Hot-Rolled or Forged. Covers 8 classes of steel made by the open-hearth, electric, or crucible process. Gives requirements for physical properties and chemical composition; methods of sampling, inspection, and tests; and packing and marking.

References.—Methods of analysis, general requirements for metals, *see* 600.1; alloy steel billets, *see* 621.31.

603. IRON AND STEEL BARS, RODS, AND WIRE

603.0 GENERAL ITEMS

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Division, Signal Section. Manual of Recommended Practice, 1941. Specifications for Various Types of Steel. This organization has recommended the use of certain specifications of the Society of Automotive Engineers, namely No. 1020 open hearth carbon steel for forging and general utility, No. 1035 for forged parts, gears, shafts, rods, etc., No. 1112 or X1112 for a free machining Bessemer steel, hot-rolled unless cold-rolled is called for, X1315 for case-hardened parts and superior machining, and No. 3130 for a nickel chromium steel suitable for water quenching where greater strength and toughness are required than possible with plain carbon steel.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE Standard Steels. The steel compositions included in this standard are considered adequate for practically all parts made of ferrous materials that are necessary for the production of automotive apparatus, and include grades that have been found commercially available and technically adequate for the service required of such parts. Includes general instructions, explanation of SAE numbering system, chemical compositions, methods of sampling for check analysis, method of determining hardenability, grain size charts for classification of steel, magnaflux testing, determination of inclusions, general characteristics and heat treatments, tension test specimens, physical properties, hardness tests, and definition of heat treating terms.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R166-37; 1937. Color Code for Marking Steel Bars. This recommendation establishes a code of definite color markings for, and location thereof, on various kinds of steel bars. Sponsored by the National Association of Purchasing Agents.

U. S. Gov., Treasury Dept., Procurement Div. 292; 1938. Steel, Machinery, Cold-Rolled or Cold-Drawn, Bars and Rods. Shall be of but one class, free from injurious defects and rust, and have a bright, smooth, and workmanlike finish. Gives requirements for chemical composition, variations in sizes, specified dimensions, and variations in width and thickness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

603.1 WROUGHT IRON BARS AND RODS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels. 1944. Steel and Wrought Iron Rivet Bars. Include rules for inspection and tests.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels. 1944. Steel and Wrought Iron Staybolt Bars. Includes rules for inspection and tests.

American Public Works Assn. Sewers, J1-38; 1938. Includes wrought iron steps and ladder bars made from Grade A bars which conform to A.S.T.M. specification for single and double refined wrought iron. To be galvanized in accordance with A.S.T.M. specification for zinc (hot-galvanized) coatings.

American Society of Mechanical Engineers, Boiler Construction Code, 1940. Specifications for Staybolt, Wrought-Iron, Solid (S-18). Includes rivet iron, staybolt iron, and extra-refined iron; requirements as to process, tensile strength, bend tests, etch test, and test specimen. In substantial agreement with American Society for Testing Materials Specification A84-39.

American Society for Testing Materials, A 41-36; 1936. American Standards Assn. G12-1936. Refined Iron Bars.

Made from new wrought iron or with some iron scrap but free from any steel scrap. Gives chemical composition, tensile and bending properties, etch test, test specimen, permissible variations in gage, finish, and inspection.

American Society for Testing Materials, A 84-39; 1939. Staybolt Wrought Iron; Solid. Covers round staybolts. Includes manufacture, chemical composition, tensile and bending properties, etch test, test specimen, permissible variations in size, finish, and inspection.

American Society for Testing Materials, A 85-36; 1936. Common Iron Bars. Made from reworked iron scrap with some steel scrap, requirements as to chemical composition, tensile and bending properties, etch test, test specimen, permissible variations in gage, finish, and inspection.

American Society for Testing Materials, A 86-39; 1939. Staybolt Wrought Iron, Hollow-Rolled. Covers only hollow-rolled staybolts, method of manufacture, chemical composition, tensile and bending properties, splitting test and etch test, test specimen, permissible variations in size, finish, and inspection.

American Society for Testing Materials, A 189-42; 1942. Single and Double Refined Wrought-Iron Bars. Includes two grades of iron bars, from wrought iron without admixture of iron scrap or steel; chemical composition, tensile and bending properties, step and etch tests, test specimen, permissible variations in size, and inspection.

American Society for Testing Materials, A 207-39; 1939. American Association of State Highway Officials, M100-39. Rolled Wrought-Iron Shapes and Bars. Gives requirements as to chemical composition, tensile and bending properties, test specimen, permissible variations in size and weight, finish, and inspection.

American Transit Assn. Standard Specification for Refined Wrought Iron Bars, E16-37; 1937. The bars called for in this specification shall be made from a mixture of new iron and scrap, but shall be free from any admixture of steel. The specification covers chemical composition, physical properties and tests, permissible variations and gages, finish, and inspection and rejection of round and flat bars.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Division, Signal Section. Manual of Recommended Practice, 1939. Specification for Refined Iron Bars. This organization has adopted the current A.S.T.M. specification A 41 for refined iron bars. The bars shall be made from new wrought iron, or from a mixture of new wrought iron and iron scrap, and shall be free from any admixture of steel.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Refined Wrought Iron Bars. Specifications M-302-41; 1941. Covers two grades—(A) double refined bars, and (B) single refined bars. Gives manufacture, chemical and physical properties and tests, permissible variations, finish, marking, and inspection and rejection.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Staybolt Iron, Hollow Rolled, M-304-39; 1939. Made from reworked wrought or charcoal iron. Gives requirements as to the chemical and physical properties and tests, permissible variation from true round and size of hole within staybolt, finish, and marking.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Staybolt Iron, Solid, M-305-39; 1939. Rolled from wrought or charcoal iron. Covers composition, tension and bend tests, etch test, diameter variation, finish, and marking.

National Association of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2, 1944. Iron, Wrought. Covers definition, derivation, constants, uses, forms, and substitutes.

U. S. Gov., Federal Specification QQ-I-686a; 1938. Amendment 1; 1942. Iron, Wrought (Refined); Bars. Covers three grades—(A) extra refined, (B) refined, and (C) refined (no physical tests). Gives requirements for material, workmanship, permissible variations in dimensions, chemical composition, tensile properties, and physical characteristics; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 18B5; 1931. Bars; Flinders.

U. S. Gov., Navy Dept. Specification 46-I-7c: 1944. Iron, Wrought (Refined): Bars.

U. S. Gov., Navy Dept. U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for wrought-iron bars for stays and stay bolts—material, tensile properties, chemical composition and tests, finish, and marking. In substantial agreement with American Society for Testing Materials Standard Specification A 84-39.

References.—Standard sizes, marking of type, *see* 603.0; methods of testing, general requirements for metals, *see* 600.1; Classification of metals, *see* 600.2; zinc coatings, *see* 600.3; size and weight tolerances, *see* 600.7.

603.2 CARBON STEEL BARS AND RODS

603.20 General Items

American Iron and Steel Institute. Steel Products Manual. Section 8; 1940. Revised, 1943. Hot Rolled Carbon-Steel Bars. Covers definitions and manufacturing practices; standard steels including limits and ranges for nonstandard steels; standards relating to check analyses; standard mill practices, glossary of manufacturing terms; and standard methods for marking, packaging, and loading.

603.21 Steel Stock for Bolts, Nuts, Rivets, and Screws

American Bureau of Shipping. Rules for the Classification and construction of Steel Vessels, 1944. Steel and Wrought Iron Rivet Bars. Include rules for inspection and tests.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Steel and Wrought Iron Staybolt Bars. Include rules for inspection and tests.

American Iron and Steel Institute. Steel Products Manual. Carbon Steel Semi-finished Products, Bars, and Wire Rods, 1941. Gives chemical composition limits and ranges and numerical designations for various basic open-hearth and acid Bessemer steels, for basic open-hearth and acid Bessemer sulphurized and phosphorized carbon steels, and methods of sampling for check analysis and standard variations from specified chemical limits of rolled and forged steel products. Also fundamental requirements for physical test properties.

American Society of Mechanical Engineers, Boiler Construction Code, 1940. Specifications for Boiler Rivet Steel, Staybolt Steel, and Rivets S-5. Identical with American Society for Testing Materials Specification A31-40.

American Society of Mechanical Engineers, Boiler Construction Code, 1940. Specifications for Steel Bars, S-7. Based on American Society for Testing Materials Specification A7-39, referred to below.

American Society of Mechanical Engineers, Society of Automotive Engineers, Sponsor. American Standards Assn. B 18g-1929, with 1942 Addendum B 18g1-1942. Tinners', Coopers', and Belt Rivets. The types of small rivets covered by this Standard are designated, respectively, as Tinners', Coopers', and Belt. Recommendations concern proportions, tolerances, composition and physical properties of rivet material, physical tests of rivets, finish, and dimensions.

American Society for Testing Materials, A 7-42; 1942. American Association of State Highway Officials, M 94. American Standards Assn. G24-1942. Steel for Bridges and Buildings. Covers carbon-steel of structural quality for use in the construction of bridges and buildings and for general structural purposes. Requirements as to castings, rivet steel, forgings, structural bolts, and rolled base plates; chemical composition, tensile and bending properties, preparing of test specimen, permissible variations in weight and thickness, finish, and inspection.

American Society for Testing Materials, A 31-40; 1940. A.S.M.E. Boiler Construction Code Specification, SA-31. American Standards Assn. G28-1; 1942. Boiler Rivet Steel and Rivets. For two grades, based on tensile strength, to be used in boilers and other pressure vessels. Gives requirements for chemical composition, analyses, tensile and bending properties, test specimens, permissible variations in diameter, finish, and inspection; for rolled steel bars, and rivets.

American Society for Testing Materials, A 107-42; 1942. Commercial Quality Hot-Rolled Bar Steels. Covers rounds, squared, and hexagons of all sizes, and flats not over 6 in. in width, made from carbon-steel. Requirements as to chemical composition, ladle analysis, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, A 108-36; 1936. Commercial Cold-Finished Bar Steels and Cold-Finished Shafting. Covers steel grades in common use including free-cutting steels, also cold-finished shafting and key stock; rounds, squared, and hexagons of all sizes, and flats not over 6 in. in width. Shafting covered are rounds up to 8 in. inclusive. Requirements as to chemical composition, permissible variations in size, workmanship, and inspection.

American Society for Testing Materials, A 141-39; 1939. American Association of State Highway Officials, M 97-39. American Standards Assn. G21-1939. Structural Rivet Steel. Covers soft-carbon steel for rivets for structural purposes. Gives chemical composition, ladle analysis, tensile and bending properties, test specimen, permissible variations in diameter, finish, and inspection.

American Society for Testing Materials, A 195-41; 1941. American Association of State Highway Officials, M 98-41. American Standards Assn. G42.1-1942. High-Strength Structural Rivet Steel. For use with structural silicon steel and equivalent steels; annealing, chemical composition, ladle analysis, tensile properties, upsetting test, test specimen, and permissible variations in size.

American Society for Testing Materials, A 261-44T; 1944. A.S.M.E. Boiler Construction Code Specification SA-261. Tentative Specification for Heat-Treated Carbon-Steel Bolting Material. For material 2 in. and under in diameter for pressure vessels, valves, flanges, and fittings. Gives requirements for basis of purchase, process, heat treatment, chemical composition, analysis, tensile properties, hardness test, test specimens, number of test, retests, finish, nuts and washers, threads, marking, inspection, and rejection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1943. Emergency Specification E-M-122-43. Modifies AAR Specification M-122-37, Commercial Bar Steels—Hot Rolled and Cold Finished, by changing check analysis, permissible variations, table for grades and chemical composition, eliminating tables II, III, and IV, and new table for information only.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Commercial Bar Steels—Hot Rolled and Cold Finished, M-122-37; 1937. For bolts, bushings, and general purposes, all shapes under 6 in. wide. Requirements for manufacture, chemical composition, analysis, including tables for fifteen S.A.E. grades, carbon and alloy steel, permissible variations, and uses of the various grades of steel.

Hydraulic Institute. Material Specification for Heavy Duty Bolting Materials and Nuts, No. 520; 1939. These specifications cover an alloy steel bolting material and a carbon steel nut material for service where the metal temperature does not exceed 900°F. Includes rolled, forged, or cold-drawn bar bolts, screws, and studs; requirements for manufacture, chemical composition, physical properties, finish, thread standards, and chemical composition same as class B7 of A.S.T.M. A-193-37T; but with physical tests modified to suit standard materials furnished.

National Association of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Steel, Cold Drawn Bessemer Screw. Covers definition, grades and properties, marketing, uses, substitutes, and packing.

Society of Automotive Engineers. Aeronautical Material Specification 5010A; 1942. Steel Screw Stock. Gives requirements for form (cold-drawn bars), composition, condition, quality, reports, and rejections. Similar specifications: Navy 46S17b; S.A.E. 1112.

U. S. Gov., Federal Specification QQ-S-701; 1932. Steel; Staybolt (Boiler). Covers a single grade of material for either solid or hollow staybolts; made by the open-hearth or electric furnace process. Gives physical and chemical requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 46S17c; 1942. Steel; Cold-Rolled or Cold-Drawn (Screw Stock).

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for alloy-steel bolting material for boiler and pressure vessel parts or attachments, valves, flanges, and fittings for high-temperature service to 1,000° F.—process, heat treatment, chemical composition, tensile properties, Brinell hardness test, workmanship, finish, and nuts and washers. In substantial agreement with American Society for Testing Materials Standard Specification A96-39.

U. S. Gov., Navy Dept., U. S. Coast Guard Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for three grades of rivet steel—(A) and (B) low carbon and (C) chrome-manganese-silicon alloy-steel—and requirements for rivets—chemical composition, tensile and bending properties, test specimens, tests of finished rivets, permissible variations in diameter, workmanship, and finish. In substantial agreement with American Society for Testing Materials Standard Specifications A31-40 and A202-39.

U. S. Gov., Treasury Dept., Procurement Div., No.290; 1938. Steel, Cold-Rolled or Cold-Drawn (Screw Stock). Material shall be furnished as rods or bars, free from injurious defects, and shall have a bright, smooth, and workmanlike finish. Gives requirements for chemical analysis, size, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Alloy steel stock for bolts, rivets, screws, *see* 621.31: standard sizes, marking of type, of bars, *see* 603.0: methods of testing, general requirements for metals, *see* 600.1; classification of metals, size and weight tolerances, *see* 600.2, 600.7; screws, bolts, rivets, *see* 608.2, 608.3, 608.4.

603.22 Steel for Case Hardening

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-107-29; 1940. Steel Bar, for Shell Stock.

References.—Standard sizes, marking of type, *see* 603.0, methods of testing, general requirements for metals, *see* 600.1; classification of metals, size and weight tolerances, *see* 600.2, 600.7; alloy steel for casehardening, *see* 621.31.

603.23 Commercial Grade Steel Bars and Rods

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Round and Flat Iron Bars. Include rules for inspection and testing.

American Iron and Steel Institute. Steel Products Manual. Section 9; 1940. Revised 1943. Cold Finished Steel Bars and Shafting. Covers methods of manufacture, definitions and manufacturing practices, shafting, and special shapes; standard manufacturing tolerances; standard steels—carbon and alloy, nonstandard steels—ranges and limits, permissible variations for check analyses, and methods of sampling; and packaging and loading.

American Society for Testing Materials, A 107-42; 1942. Commercial Quality Hot-Rolled Bar Steels. Covers rounds, squares, and hexagons of all sizes, and flats not over 6 in. in width, made from carbon-steel. Requirements as to chemical composition, ladle analysis, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, A 108-36; 1936. Commercial Cold-Finished Bar Steels and Cold-Finished Shafting. Covers steel grades in common use including free-cutting steels, also cold-finished shafting and key stock; rounds, squares, and hexagons of all sizes, and flats not over 6 in. in width. Shafting covered are rounds up to 8 in., inclusive. Requirements as to chemical composition, permissible variations in size, workmanship, and inspection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2, 1944. Steel; Bar (Carbon Steel Bar). Covers definition, derivation, size range, tolerances, characteristics, and ordering.

Society of Automotive Engineers. Aeronautical Material Specification 5070; 1942. Carbon-Steel (.18-.23 Carbon). For bars, rods, billets, or forgings. Covers requirements for composition, grain size, condition, quality, tolerances, reports, shipments, indentification, and rejections. Similar Specifications: AN-QQ-S-646, number X1020; SAE 1022.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-646a; 1944. Steel; Carbon (1020, 1022, and 1025) Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-4a; 1944. Steel; Carbon (1035) Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-5a; 1944. Steel; Carbon (1095) Bar and Rod.

U. S. Gov., Federal Specification QQ-S-671; 1941. Amendment 1; 1942. Steel; Carbon and Alloy, Bars. Covers 22 carbon steels, and 8 free-cutting steels, in seven conditions—as rolled (hot-rolled or forged), annealed, normalized, normalized and tempered, quenched and tempered, cold-rolled or cold-drawn, and stress relief annealed. Gives requirements for material, manufacture, quality, and condition, condition and finish, heat treatment, chemical composition, physical properties, dimensions, and tolerances; methods of inspection and tests; requirements for packing and marking for shipment; tables of chemical requirements; and tables of permissible variations in squares, rounds, hexagons, and flats.

U. S. Gov., Treasury Dept., Procurement Div. 293A; 1941. Steel, Carbon, Mild; Bars and Billets. Shall be either cold-rolled or cold-drawn unless otherwise specified, manufactured by the open-hearth, electric-furnace or crucible process. Gives requirements for chemical composition, physical properties, tolerances, lengths, tensile tests, and methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Treasury Dept., Procurement Div. 297; 1938. Steel; Carbon, Hot-Rolled or Forged. Covers 8 classes of steel made by the open-hearth, electric, or crucible process. Gives requirements for physical properties and chemical composition; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-107D; 1941. Steel; Bar, Carbon, and Alloy.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-107-31; 1944. Steel, Carbon, WD-1050 Modified; Bars and Shapes.

References.—Standard sizes, marking of type, *see* 603.0; methods of testing, general requirements for metals, *see* 600.1; Classification of metals, size and weight tolerances, *see* 600.2, 600.7; structural grades, *see* 605.1.

603.24 Steel for Shafts, Axles, and Forgings

American Iron and Steel Institute. Steel Products Manual. Section 9; 1940. Revised, 1943. Cold-Finished Steel Bars and Shafting. Covers methods of manufacture, definitions and manufacturing practices, shafting, and special shapes; standard manufacturing tolerances; standard steels—carbon and alloy, nonstandard steels—ranges and limits, permissible variations for check analyses, and methods of sampling; and packaging and loading.

American Society for Testing Materials A 108-36; 1936. Commercial Cold-Finished Bar Steels and Cold-Finished Shafting. Covers steel grades in common use including free-cutting steels, also cold-finished shafting and key stock; rounds, squares, and hexagons of all sizes, and flats not over 6 in. in width. Shafting covered are rounds up to 8 in. inclusive. Requirements as to chemical composition, permissible variations in size, workmanship, and inspection.

Drop Forging Assn. Standard Tolerances for Forgings (for Forgings Under 100 Pounds Each), 1937. Gives special and regular tolerances, dividing regular into commercial and close standard classes for thickness, width, draft angle, quantity, fillets and corners; with tables of tolerances for various weights of forgings for both classes.

U. S. Gov., Navy Dept., General Specifications for Inspection of Materials (1941), Appendix II, Metals, Part D, Photomicrographic Standards, Section 1, Photomicrographic Standards for Steel Forgings.

U. S. Gov., Navy Dept. Specification 46S6c; 1940. Steel; Carbon, Hot-Rolled or Forged For use of Naval Gun Factory.

U. S. Gov., Navy Dept. Specification 46S13c; 1937. Steel, Machinery, Cold-Rolled or Cold-Drawn; Bars and Rods.

U. S. Gov., Navy Dept. Specification 46S43; 1944. Steel, Rolled, Heat-treated: Bars (for Shafting).

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-104-1B; 1942. Forging; Steel for Shell Stock.

References.—Other steels of forging quality, *see* 611.51 and specifications of commodities made of forged steel: Standard sizes, marking of type, *see* 603.0; methods of testing, general requirements for metals, *see* 600.1; classification of metals, size and weight tolerances, *see* 600.2, 600.7; forged steel, forged steel shafts and axles, *see* 611.51, 611.52, alloy steel for forgings, forged alloy steel and axles, *see* 621.31, 622.6.

603.25 Steel Reinforcing Bars and Rods

References.—Reinforcement steel, *see* 605.25.

603.26 Steel Bars and Rods for Welding

American Society for Testing Materials, A 233-43T; 1943. A.S.M.E. Boiler Construction Code Specification, SA-233. Iron and Steel Arc-Welding Electrodes. Covers lightly coated and covered metal for welding of carbon and low alloy steels. Gives requirements for manufacture, standard sizes and lengths, chemical composition, chemical analysis, all-weld-metal tension tests, weld contour tests, face and root bend tests of welded joints, permissible variations in dimensions, electrode coverings, workmanship, finish, packing, marking, and guarantee.

American Society for Testing Materials, Tentative Specification A 251-42T; 1942. A.S.M.E. Boiler Construction Code Specification, SA-251. Tentative Specifications for Iron and Steel Gas-Welding Rods. Covers gas-welding rods for the welding of carbon and low-alloy steels. Gives manufacture, standard sizes and lengths, chemical composition, tension tests, face and root-bend tests, permissible variations in dimensions, workmanship, finish, packing, marking, and guarantee.

American Transit Assn. Standard Specification for Manganese-Steel Electrodes, W53-35; 1935. This specification covers the kind of material, physical characteristics, recommended sizes and lengths, chemical and physical tests, marking, packing, and inspection of electrodes.

American Transit Assn. Standard Specification for Filler Metal for Use in Building Up Worn Carbon-Steel Rails, W54-35; 1935. The scope of this specification covers the kind of material, physical characteristics, recommended sizes and lengths, uses, testing procedure, test results, contact points, and inspection of filler metal.

American Welding Society. Tentative Specifications for Iron and Steel Gas-Welding Rods, 1942. Covers gas-welding rods for the welding of carbon and low-alloy steels of weldable quality. Gives requirements for manufacture, standard sizes and length, chemical composition, tension tests, face and root-bend tests of welded joints, permissible variations in dimensions, workmanship and finish, packing, marking, and guarantee. Prepared jointly by A.W.S. and American Society for Testing Materials.

Heating, Piping, and Air Conditioning Contractors National Assn. Standard Manual on Pipe Welding, 1931. Specification for low carbon welding rod, chemical composition, and tensile requirements of metal deposited in weld. Includes flame test for size, and types of welding rods.

Resistance Welder Manufacturers Assn. Seam Welding Electrodes, 1940. Covers seam welding electrodes and replaceable resistance welding electrodes. Gives tables covering recommended electrode materials for spot welding similar and dissimilar metals using conventional spot welding methods; classification of comparative alloys; coding system for pointed, dome, flat and offset standard electrodes; pointed tips with tapered shanks; flat tips with tapered shanks; dome tips with tapered shanks; and offset tips with tapered shanks.

U. S. Gov., Navy Dept. Specification 17E4a; 1942. Electrodes, Welding (Covered), Nickel-Copper-Alloy.

U. S. Gov., Navy Dept. Specification 22W7c; 1936. Electrodes, Welding (Bare, Coated, or Covered), Iron and Steel.

U. S. Gov., Navy Dept. Specification 46R2c; 1940. Rods, Welding (Oxyacetylene), Steel (Corrosion-Resisting, 18-8 Type) (Columbium Bearing) (Aircraft Use).

U. S. Gov., Navy Dept. Specification 46R4b; 1940. Rods (and Wire), Welding, Iron and Steel (for Gas Welding).

U. S. Gov., Treasury Dept., Procurement Div. 542b; 1943. Electrodes, Arc-Welding, Iron and Steel. Covers 30 classes showing welding positions, covering or coating and polarity and current of electrodes, tensile strength, yield point, and elongation. Gives requirements for sizes and lengths, material, finish, and details; methods of sampling, inspection, and test; and packing and marking.

U. S. Gov., Army-Navy Aeronautical Specification AN-E-9; 1944. Electrodes; Mild and Alloy Steel Welding.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-114-1A; 1942. Steel, Plain Carbon and Low-Alloy High-Tensile, Plate, Shapes, Sheet, Strip, and Rectangular Bars, for Welded Structure.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-203-1B; 1944. Electrodes, Welding, Steel, Covered (Plain-Carbon and Low-Alloy).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-203-2A; 1944. Rods, Gas, Welding, Steel.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-203-3; 1944. Electrodes, Welding, Steel, Covered, Austenitic.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-203-5; 1944. Electrodes, Welding, Steel, Covered (for Hard Surfacing).

References.—Methods of testing and general requirements for metals, *see* 600.1; welding apparatus and practice, *see* 767; iron and carbon steel welding wire, *see* 603.41; cast-iron rod for welding, *see* 611.19; brass rod, aluminum rod, for welding, *see* 645.11, 631.31.

603.27 Steel Bars and Rods for Automotive and Railway Use

Society of Automotive Engineers. Aeronautical Material Specification 5132; 1941. Steel; High-Carbon. For bars, rods, or as ordered. Gives requirements for composition, condition, quality, tolerance, reports, and rejections.

References.—Steels suitable for railway and automotive uses, *see* 603.21, 603.23, 603.24. 603.33; structural steels for railway use, *see* 605.1; alloy steels, *see* 621.3; standard sizes, marking of type, *see* 603.0; methods of testing, general requirements for metals. *see* 600.1: classification of metals, tolerances on size and weight, *see* 600.2, 600.7.

603.29 Miscellaneous Steel Bars and Rods

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-107-30; 1943. Steel, Free-Cutting, Bars or Wire, for Time-Fuze Parts.

603.3 SPRING AND TOOL STEEL BARS AND RODS

603.31 Drill Tool Steel Bars and Rods

U. S. Gov., Treasury Dept., Procurement Div. 295; 1938. Steel, Tool, High-Speed and Carbon. Covers two classes of tungsten and five classes of carbon steel. Gives requirements for material, workmanship, process, imperfections, lengths, tolerances, chemical requirements, and intended uses of each class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

603.32 Hand, High-Speed, and Machine Tool Steels

American Railway Engineering Assn., Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Tool Steel. Shall be made by the open-hearth or the crucible process. Gives chemical requirements.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Steel, Tool. Covers definition, classes, types, grades, characteristics, forms available, substitutes, and specifications.

U. S. Gov., Navy Dept. Specification 46S37b; 1945. Steel, Tool, High-Speed.

U. S. Gov., Navy Dept. Specification 46S40a; 1944. Steel, Tool, Carbon.

U. S. Gov., Treasury Dept., Procurement Div. 295; 1938. Steel, Tool; High-Speed and Carbon. Covers two classes of tungsten and five classes of carbon steel. Gives requirements for material, workmanship, process, imperfections, lengths, tolerances, chemical requirements, and intended uses of each class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-108A; 1943. Steel, Tool; Carbon, Alloy, and High Speed.

References.—Standard sizes, marking of type, *see* 603.0; *methods of* testing, general requirements for metals, *see* 600.1; classification of metals, size and weight tolerances, *see* 600.2, 600.7; heat treatment, *see* 600.5; alloy tool steel, *see* 621.35.

603.33 Spring Steel Bars and Rods

American Society for Testing Materials, A 14-44; 1944. Carbon-Steel Bars for Springs. Covers three grades of hot-rolled bars determined by carbon ranges based on design of spring and stresses and service intended. Gives requirements for chemical composition, ladle analysis, check analysis, permissible variations in dimensions, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 59-39; 1939. Silicon-Manganese Steel Bars for Springs. Requirements for chemical composition of hot-rolled bars, ladle analysis, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, A 60-42; 1942. Chromium-Vanadium Steel Bars for Springs. Requirements for hot-rolled bars, chemical composition, ladle analysis, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, A 68-44; 1944. Carbon-Steel Bars for Springs With Special Silicon Requirements. For manufacture of railway and general purpose springs. Gives requirements for chemical composition, ladle analysis, check analysis, permissible variations in dimensions, finish, marking, inspection, and rejection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1943. Emergency Specification E-M-112-43, modifies AAR Specification M-112-42, Steel Bars, Carbon, for Railway Springs, by the inclusion of round-edge flat spring steel bars of additional sizes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Steel Bars, Carbon, for Railway Springs, M-112-42; 1942. Manufacture, composition, analysis, permissible variations for rounds, squares, and flat stock.

U. S. Gov., Navy Dept. Specification 47 S 4g; 1943. Steel, Spring, Round or Square (Including Rectangular Sections Having Thicknesses Greater Than Half Their Width).

U. S. Gov., Navy Dept. Specification 47 S 27a; 1943. Steel, Spring, Flat Stock.

References.—Standard sizes, marking of type, *see* 603.0; methods of testing, general requirements for metals, *see* 600.1; classification of metals, size and weight tolerances, *see* 600.2, 600.7; heat treatments, *see* 600.5; alloy spring steels, *see* 621.34; carbon steel springs, *see* 611.54.

603.34 Spring Steel Strips

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-136-2A; 1941. Steel, Spring, Tempered Strip, 1095.

603.4 IRON AND STEEL WIRE

603.40 General Items

American Iron and Steel Institute. Steel Products Manual. Section 15; 1941. Revised, 1942. Hot-Rolled Carbon-Steel Wire Rods. Gives definition, size classification, steel making processes, chemical and physical properties, quality classifications, and tolerances.

American Iron and Steel Institute. Steel Products Manual. Section 17; 1942. Flat Steel Wire. Includes requirements for qualities and grades, steel making processes and chemical composition, shape, and dimensions, tempers, temper designations, tolerances, camber, finishes, inspections and tests, packaging and protection, and standard methods of specifying; tubes of composition and identification designations of standard steels, and limits and ranges for nonstandard steels; and glossary of terms for killed, semikilled, and rimming steel.

603.41 Bare and Coated Iron and Steel Wire

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for reinforcement—material ("structural steel grade" or "intermediate grade," open hearth to comply with A.A.S.H.O. Standard Specification M-31; with tensile requirements to conform to American Society for Testing Materials Specification A-15; bar mat to conform to A.A.S.H.O. Specification M-54; and will mesh to conform to A.A.S.H.O. Specification M-55), order lists, protection, fabrication, placing and fastening, splicing, lapping, substitutions, measurement, and payment.

American Iron and Steel Institute. Steel Products Manual. Section 16; 1942. Carbon-Steel Wire. For wire, methods of manufacture, classification by size of wire and size of coil, types and finishes of coarse round wire, classification of zinc coated (galvanized) wire, chemical and physical properties, packaging, tolerances, fine round wire, and tables for size and weights.

American Society for Testing Materials, A 82-34; 1934. American Assn. of State Highway Officials, M 32-42. American Standards Assn. A50.3-1936. Cold-Drawn Steel Wire for Concrete Reinforcement. For use as wire or in fabricated form for concrete reinforcement. Gives sizes, tensile and bending properties, preparation of test specimen, permissible variations in gage, finish, and inspection.

American Society for Testing Materials, A 227-41; 1941. Hard-Drawn Steel Spring Wire. Requirements as to chemical composition, ladle analysis, tensile properties, coiling and fracture test, permissible variations in dimensions, surface condition, and inspection.

American Society for Testing Materials, A 228-41; 1941. Steel Music Spring Wire. Gives requirements as to chemical composition, ladle analysis, tensile properties, coiling test, permissible variations in dimensions, surface condition, and inspection.

American Society for Testing Materials, A 229-41; 1941. Oil-Tempered Steel Spring Wire. Covers chemical composition, ladle analysis, requirements for tensile properties, coiling and fracture test, permissible variations in dimensions, surface condition, and inspection.

American Society for Testing Materials, A 230-41; 1941. Carbon-Steel Valve Spring Quality Wire. Covers tempered spring wire for springs requiring high-fatigue properties. Requirements as to chemical composition, ladle analysis, tensile properties, twist test, permissible variations in dimensions, decarburization, surface condition, and inspection.

American Society for Testing Materials, A 231-41; 1941. Chromium-Vanadium Steel Spring Wire. Covers untempered steel wire for use in springs at moderately elevated temperatures. Requirements as to chemical composition, ladle analysis, permissible variations in dimensions, surface condition, and inspection.

American Society for Testing Materials, A 232-41; 1941. Chromium-Vanadium Steel Valve Spring Quality Wire. For highest quality chromium-vanadium valve spring wire requiring high-fatigue properties, especially at moderately elevated temperatures. Chemical composition, ladle analysis, physical requirements, permissible variations in dimensions, decarburization, surface condition, and inspection.

American Society for Testing Materials, A 233-43T; 1943. A.S.M.E. Boiler Construction Code Specification No. SA-233. Tentative Specifications for Iron and Steel Arc-Welding Electrodes. Covers lightly coated and covered metal for welding of carbon and low alloy steels. Gives requirements for manufacture, standard sizes and lengths, chemical composition, chemical analysis, all-weld-metal tension tests, weld contour tests, face and root bend tests of welded joints, permissible variations in dimensions; electrode coverings, workmanship, finish, packing, marking, and guarantee.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-16; 1927. Galvanized Iron Tie Wires. Includes No. 8 and 9 B. W. G. wire, elongation, and breaking strain of soft wire, galvanized to meet requirements of A. A. R. specification 1-D-5.

National Association of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Wire; Spring Steel. Covers definition, grades and classes, specifications, finishes, and containers.

Package Research Laboratory. Bulletin 309; 1943. Wire for All-Bound Rock Fastener 4-One Boxes and Crates. Wire is technically described as low carbon steel wire and is divided into two general types, (a) stapling wire and (b) binding wire. Gives details covering physical properties of wire; details for each type including sizes, grades, and finishes; Rockaway wire tester, purchase specifications for wire, and details concerning staples.

Society of Automotive Engineers. Aeronautical Material Specification 5032; 1943. Annealed Steel Wire; Uncoated. Gives requirements for composition, condition, quality, tolerances, reports, packaging, marking, and rejections. Similar Specifications: Army 48-5, type I, grade WD-1020; Federal QQ-W-461, grade FS 1020; SAE 1020.

Society of Automotive Engineers. Aeronautical Material Specification 5033; 1942. Steel Wire; Zinc-Coated (Low-Carbon). Gives requirements for composition, condition, quality, tolerances, reports, packaging, and rejections. Similar specification: Army-Navy Aeronautical AN-QQ-W-435.

Society of Automotive Engineers. Aeronautical Material Specification 5110; 1940. Music Wire (Commercial). Gives requirements for form (cold-drawn wire supplies as coils of wire or as finished springs), composition, condition, quality, tolerance, finished springs, and rejections. Similar Specifications: Army 48-26; Navy 22 W 11.

Society of Automotive Engineers. Aeronautical Material Specification 5112B; 1943. Music Wire (Best Quality). For cold-drawn wire supplies as coils of wire or as finished springs. Gives requirements for composition, diameter, tensile strength, quality, tests, tolerances, finished springs, reports, identification, and rejections. Similar Specifications: Army-Navy Aeronautical AN-QQ-W-441; SAE 1085, ASTM A228-41.

Society of Automotive Engineers. Aeronautical Material Specification 5115A; 1943. Carbon Steel Spring Wire (Valve Spring Quality). For cold-drawn, hardened and tempered wire supplied as coils of wire or as finished springs. Gives requirements for composition, diameter, tensile strength, elongation, quality, tolerances, finished springs, reports, identification, and rejections. Similar Specifications: SAE 1070, ASTM A230-41.

U. S. Gov., Army Air Forces Specification, 10285-A-3; 1943. Wire, Metal; Spray Gun.

U. S. Gov., Army Air Forces Specification, 10286-C; 1945. Wire; Iron and Steel Welding, for Aeronautical Use.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-W-429-1; 1942. Wire; Steel, High-Strength, Zinc-Coated.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-W-435-3; 1943. Wire; Steel, Soft, Zinc-Coated.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-13-2; 1944. Wire; Aircraft Stitching.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-17; 1944. Wire; Spring Steel, Music Wire.

U. S. Gov., Federal Specification QQ-W-311; 1939. Wire; Bale-Tie, Single-Loop. Covers one type and two classes—(A) black and (B) zinc-coated (glavanized); either Bessemer, electric furnace, or open-hearth steel. Gives requirements for sizes, workmanship, manufacture, details for classes A and B, diameter, length tolerance, and physical properties; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-W-414; 1941. Wire, Steel; Bookbinders'. Covers two types—(I), flat, coppered or tinned; and (II) round, coppered, tinned, or liquor-finished. Gives chemical composition, width, thickness, tolerances, and strength; methods of inspection, sampling, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-QQ-W-414; 1942. (issued by Procurement Div., Treasury Dept. U. S. Gov.) changed requirements for protective finish and deletes all reference to coppered, tinned, and liquor-finished coatings.

U. S. Gov., Federal Specification QQ-W-432; 1941. Wire, Steel; Market. Covers one type and four finishes—(A) bright, (B) coppered, (C) tinned, and (D) zinc-coated; of Bessemer, open-hearth, or electric furnace steel. Gives requirements for sizes, tolerances, tensile strength, ductility, finish, weight of tin and zinc coating, and adherence of coating; methods of inspection, sampling, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-W-446; 1939. Wire; Steel, Zinc-Coated (for Wire-Bound Boxes). Covers two types—(I) binding wire and (II) stapling wire; either electric furnace or open-hearth steel. Gives requirements for weight and uniformity of zinc coating, size, and physical properties; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification QQ-W-461; 1941. Wire, Steel (Carbon); Bare and Zinc-Coated. Covers four grades—FS 1010, FS 1020, FS 1035, and FS 1045; and three weights—(A) medium, (B) heavy, and (C) extra-heavy. Gives requirements for tempers, finishes, sizes, material, workmanship, chemical composition, diameter of wire, tensile strength, ductility, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-W-465; 1942. Wire, Steel (Carbon); Spring, Hard-Drawn. Covers one grade of round hard-drawn spring wire intended for the manufacture of springs. Gives requirements for material, chemical composition, tensile properties, wrapping, permissible variations in diameter; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-W-470; 1942. Wire, Steel (Carbon); Spring, Music. Covers one grade of round music spring wire intended for the manufacture of springs. Gives requirements for material, chemical composition, tensile properties, wrapping, permissible variations in diameter; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-W-474; 1942. Wire, Steel (Carbon); Spring, Oil-Tempered. Covers one grade of round oil-tempered spring wire intended for the manufacture of springs. Gives requirements for material, chemical composition, tensile properties, wrapping, permissible variations in diameter; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 22W8d; 1944. Wire, Sounding.

U. S. Gov., Navy Dept. Specification 22W11c; 1943. Wire, Steel (High Carbon); Spring (Music Wire).

U. S. Gov., Navy Dept. Specification 22W12b; 1943. Wire, Steel, High Strength, Zinc-Coated.

U. S. Gov., U. S. Army, Army Air Forces. Specification 48-25; 1929. Wire, Cold-Drawn, WD-1045.

U. S. Gov., U. S. Army, Army Air Forces. Specification 48-38; 1941. Wire, Iron and Constantan, Thermocouple.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 48-9; 1925. Wire, Bridge, Submarine Gas Mask.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 48-11; 1925. Wire, Ring, Submarine Gas Mask.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1062; 1937. Iron Wire, Standard Reagent Grade.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 48-6A; 1941. Wire, Steel, Spring, Hard-Drawn.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 48-7-1; 1942. Wire, Steel, Spring, for Small Arms Weapons, WD 1085 Special, WD 1095 Special and WD 6150 Special.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 48-7A; 1941. Wire, Steel, Spring, Carbon and Alloy, Oil-Tempered or Annealed.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 48-18A; 1941. Wire, Steel, Music Spring.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-107-30; 1943. Steel, Free-Cutting, Bars or Wire, for Time-Fuze Parts.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 48-5A; 1940. Wire, Soft, Iron and Steel, Bare and Coated.

References.—Iron and steel welding rod, *see* 603.26, 611.19, 622.4; alloy steel welding wire, *see* 622.4; fence wire, *see* 603.43; telephone, telegraph, signal, track bonding wire of iron or steel, *see* 715.43; methods of testing, general requirements for metals, *see* 600.1; wire gages, *see* 603.40; zinc coatings and tests, *see* 600.3.

603.42 Bare and Coated Wire Rope

American Assn. of State Highway Officials, M30-42. Standard Specification for Wire Rope and Fittings for Highway Guard Rail. Covers 3/4-in. and 1-in. wire rope and fittings. Gives general requirements, properties, and marking and shipping for wire rope; and galvanizing and methods of sampling and testing for fittings.

American Assn. of State Highway Officials, T39-42. Standard Method of Test for Wire Rope (Guardrail). The report of the physical test of wire rope shall include diameter of rope, diameter of wire, number of strands and wires, length of lay of strands and wires, cross-sectional area in square inches, and breaking load in pounds. Gives definitions and preparation of specimen for test.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Steel Wire Rope. Include rules for the inspection and testing.

American Mining Congress, sponsor. American Standards Assn., M11-1927. Wire Rope for Mines. Types, material grades according to strength, torsional and wrapping test requirements, galvanizing, fiber core and lubrication requirements, weight, minimum strength, and construction of the various grades of rope, and recommended practice in the use of wire rope at mines, clamping, seizing, socketing, splicing, drums and sheaves, lubrication, safety factor.

American Petroleum Institute, Production Div. Standard 9-A; 1944. Specification for Wire Rope. To provide wire rope of uniform quality in the minimum number of grades of material and types of construction to adequately meet the requirements of the petroleum industry. Includes cable tool drilling lines, rotary drilling or casing lines, sand lines, rotary bailing lines, tubing lines, torpedo lines, well measuring wires, and galvanized wire guy strands. Covers grades of material, properties and tests for wire and wire rope, manufacture and tolerances, type of lines, torpedo lines, well measuring wires, galvanized wire guy strand, packing and marking, inspection and rejection, and appendices.

American Railway Engineering Assn., Construction and Maintenance Section, Assn. of American Railroads. Manual of Railway Engineering, 1944. Specification for Wire Rope Used With Work Equipment. Gives construction, lay, various strand constructions, factors of safety, causes of failure, recommended types for maintenance of way use, lubrication, seizing, and sockets and mandrels.

American Society for Testing Materials, A 122-41; 1941. American Standards Assn. G 8.6-1943. Zinc-Coated

Steel Wire Strand "Galvanized" and Class A ("Extra Galvanized"). For use as guy wire, messenger wire, electrical conductor, etc. Gives requirements as to zinc coating, stranding, ductility of steel and adherence of coating, table of physical properties of strand, sizes and permissible variations, and inspection.

American Society for Testing Materials, A 218-41; 1941. American Standards Assn., G8.11-1944. Zinc-Coated Steel Wire Strand, Class B and Class C Coatings. For use as guy wires, messenger wires, span wires, electrical conductors, overhead ground wires, etc. Gives requirements for zinc, base metal, joints, stranding, weight and uniformity of coating, physical properties, elongation, ductility, adherence of coating, size and permissible variations, workmanship and finish, packing and marking, and inspection.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice Specification 173-39; 1939. Copper-Covered Steel Guy and Messenger Strand. Seven-wire and three-wire strand for use as messengers in supporting of aerial cable and guying of overhead lines, in signal service. Tables of sizes, strength and weight, methods of test and marking.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Specifications for steel galvanized strand for recommended specification, see manual of A.A.R. Telegraph and Telephone Section 1-A-17.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-17; 1927. Galvanized Steel Guy and Messenger Strand. Gives requirements of 4 sizes of 7-strand cable, materials and workmanship, dimensions, breaking strain, elongation, and for galvanizing according to A.A.R. specification 1-D-5.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-53; 1935. Galvanized Copper-Bearing Steel Line Wire. Includes five sizes from 4 to 12 B.W.G., requirements as to composition, permissible variations in size, tensile strength, elongation, torsion, galvanizing, and tests.

Edison Electric Institute. Suggestions for Specifications for Eyenuts and Eyelets, TD-5; 1941. For use in overhead line construction. Gives requirements for material, dimensions, threads, strength, galvanizing, preferred sizes, finish, packing and shipping, inspection, rejections, and dimensional drawing.

International Municipal Signal Association, Inc. Specification No. 32; 1942. 30 Per Cent or 40 Per Cent Conductivity Copper Covered Steel Messenger Strand. Covers copper covered steel strand of two types—high strength and extra high strength for use as messengers in supporting aerial cable, fire alarm, police patrol and traffic signals or other municipal signalling equipment, and for the guying of overhead line poles. Gives requirements for material, properties, samples for test, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-76a; 1944. Cable; Single Strand Nonflexible Carbon Steel (Preformed).

U. S. Gov., Army-Navy Aeronautical Specification AN-RR-C-43-1; 1942. Cable; Steel (Carbon), Flexible, Preformed.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-23a; 1944. Shackles; Cable.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-26a; 1944. Thimbles; Wire-Cable.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R198-43. Wire Rope. Gives 20 tables of standard items, and its purpose is to conserve strategic materials and available productive capacity. Tables gives diameter, approximate weight per foot, and breaking strength.

U. S. Gov., Federal Specification RR-R-571; 1933. Amendment 6; 1944. Rope; Wire. Covers about 25 types. Gives definitions and general requirements for wire, strand, centers, cores, lubrication, marline, diameter of wire rope, and preforming; details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 12S14; 1916. Sockets; Wire-Rope.

U. S. Gov., Navy Dept. Specification 12T9a; 1942. Thimbles; Rope (Manila and Wire).

U. S. Gov., Navy Dept. Specification 22C3a; 1938. Cable, Steel, 19 Nonflexible.

U. S. Gov., Navy Dept. Specification 22C6a; 1938. Cable, Steel, Tinned, Flexible and Extra Flexible Preformed type.

U. S. Gov., Navy Dept. Specification 22R3h; 1943. Rope; Wire.

U. S. Gov., Navy Dept. Specification 22R4; 1940. Rope; Spring-Lay (Alternate Fiber Strands and Steel Wire Around a Fiber Core).

U. S. Gov., Navy Dept. Specification 22R6a; 1944. Rope, Wire, Steel (Plow), Galvanized (for Target-Towing Hawsers).

U. S. Gov., U. S. Army, Army Air Forces. Specification 48-14A; 1926. Cable, Steel Wire, Flexible 6 by 7.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 48-20a; 1939. Rope, Steel Wire, Galvanized, Marline Covered, for Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-5075; 1942. Thimble, Galvanized Steel, Submarine Mine.

U. S. Gov., U. S. Army, Signal Corps. Specification 48-10-B; 1930. Wire, Messenger, Galvanized, Types W-90, W-115, and W-116.

References.—See references under 603.43.

603.43 Manufactures of Iron and Steel Wire

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for fabric fences, window guards, elevator enclosures, and grille partitions.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Standard Right-of-Way Fences, 1935. Covers four classes—(A) 9 longitudinal wires; (B) 7 longitudinal wires; (C) woven wire fencing, 25 1/2 in. high, with

3 strands of barbed wire above; and (D) 5 strands of galvanized steel ribbon, smooth, round or barbed wire fencing. Gives requirements for wood posts, braces, wire, locks, staples, galvanizing, manufacture, erection, gates, and stock guards.

American Society for Testing Materials, A 116-39; 1939. American Standards Assn. G8.9-1944. Zinc-Coated (Galvanized) Iron or Steel Farm-Field and Railroad Right-of-Way Wire Fencing. For three classes based on weight of coating. Gives requirements for style and size, zinc for coating, base metal, sampling, weight and uniformity of coating, tests of coating, retests and rejection, size and permissible variations, packing and marking, inspection, and billing.

American Society for Testing Materials, A117-33; 1933. American Standards Assn., G8.5-1935. Zinc-Coated Iron or Steel Chain-Link Fence Fabric Galvanized After Weaving. Covers link fence with helically wound and interwoven without knots or ties, form of square mesh and top and bottom finish. Includes zinc coating, wire, test specimen, tests of coating, and inspection.

American Society for Testing Materials, A 121-39; 1939. American Standards Assn., G8.10-1944. Zinc-Coated (Galvanized) Iron or Steel Barbed Wire. For three classes of wire galvanized before fabrication, based on weight of coating. Gives requirements for size and constructions, zinc for coating, base metal sampling, weight and uniformity of coating, tests of coating, retests and rejection, size and permissible variations, packing and marking, inspection, and billing.

Society of Automotive Engineers. Aeronautical Material Specification 5112B; 1943. Music Wire (Best Quality). For cold-drawn wire supplied as coils of wire or as finished springs. Gives requirements for composition, diameter, tensile strength, quality, tests, tolerances, finished springs, reports, identification, and rejections. Similar Specifications: Army-Navy Aeronautical AN-QQ-W-441, SAE 1085, ASTM A228-41.

Society of Automotive Engineers. Aeronautical Material Specification 5115A; 1943. Carbon Steel Spring Wire (Valve Spring Quality). For cold-drawn, hardened and tempered wire, supplied as coils of wire or as finished springs. Gives requirements for composition, diameter, tensile strength, elongation, quality, tolerances, finished springs, reports, identification, and rejections. Similar Specifications: SAE 1070, ASTM A230-41.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S.A.E. Standard Wire Cloth. Adopted, 1924. Table of sizes and dimensions with tolerances and types of weave.

Underwriters' Laboratories, Inc. Marine Backfire Flame Arresters, 1931. Tentative. For use on carburetor air intakes, construction details, width of joints, corrosion, vibration, and explosion tests.

U. S. Gov., Army Air Forces Specification 16106-A, (1); 1944. Cloth; Wire Mesh, Cotton Covered.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R9-28; 1928. Woven-Wire Fencing. This recommendation establishes a schedule of sizes and varieties of woven-wire fencing for several styles of fences, namely—field fence, close-mesh hog and cattle field fence, wolf-proof fence, and poultry fence.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R122-31; 1931. Wire Insect Screen Cloth. This reccommendation establishes a number of stock varieties of black painted and electro-galvanized steel wire screen cloth and of copper and commercial bronze wire screen cloth; includes standard mesh openings, sizes of wire, widths of roll, length of roll, packing, required percentage of copper for copper and bronze screen wire.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R147-42; 1942. Wire Diameters for Mineral Aggregate Production Screens. This recommendation establishes a simplified schedule of different wire diameters used for clear openings of screen. Initiated by National Sand and Gravel Assn. and National Slag Assn.

U. S. Gov., Federal Specification RR-C-451a; 1934. Amendment 4; 1944. Cloth; Wire, Screen. Covers four types, including type D, iron or steel, galvanized (zinc coated). Gives requirements for material and workmanship, number of meshes per inch, diameter of wire, construction, length, width, and composition of wire; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification RR-C-451a; 1934. Amendment 4; 1944. Cloth; Wire, Screen. Covers four types, including type H, iron or steel, japanned or painted. Gives requirements for material and workmanship, number of meshes per inch, diameter of wire, construction, length, width, and composition of wire; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification RR-C-596; 1938. Cord; Picture-Wire. Covers two classes—(A) gilt and (B) tinned; gilt cord in sizes 10, 11, 12, 13, 14, 15, 16, 17, and 18; and tinned cord in sizes 0, 1, 2, 3, 4, 5, 6, 7, and 8; twisted or braided, and circular in cross-section. Gives requirements for material, workmanship, strands, and breaking strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-RR-C-596; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for class B and deletes all reference to class A cord.

U. S. Gov., Federal Specification RR-F-191; 1937. Fencing; Chain-Link or Welded. Covers two types: (A) Zinc-coated (in two classes—(1) chain link, and (2) welded); and (B) copper-coated, chain link. Gives requirements for material, workmanship, permissible variations, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-RR-F-191; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for fencing (wire fabric) and gives requirements for gates, posts, and wire.

U. S. Gov., Federal Specification RR-F-221; 1930. Amendment 1; 1934. Fencing; Wire (Barbed, Netting, and Woven), Black and Galvanized. Covers three types—(A) wire, barbed, zinc-coated; (B) wire, woven, farm or field fences, black or zinc-coated; and (C) wire, netting, zinc-coated. Gives requirements for material, workmanship, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks FP-41. Barbed Wire Fence.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks FP-41. Gates.

U. S. Gov., Marine Corps Specification, 1943. Hook; Double, 2 1/2-Inch.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 19Yb; 1933. Wire Fencing; Nonclimbable.

U. S. Gov., Navy Dept. Specification 57G4; 1941. Gauze, Wire, Iron, with Asbestos Center.

U. S. Gov., Navy Dept. Specification 57S36; 1944. Splints; Wire-Mesh for.

U. S. Gov., Treasury Dept., Procurement Div. 538; 1942. Gates, Posts, Top Rails, and Reinforcing Wire (for Wire Fencing). This specification covers gate, posts, top rails, top reinforcing wire and bottom reinforcing wire. Gates shall be single swing (one gate) or double swing (two gates). Posts shall cover following types: Type I, corner; type II, end; type III, gate; and type IV, line. All structural members shall be steel, and other members shall be steel, malleable iron, or wrought iron. Gives requirements for gate frame, latches, stops, keepers, hinges, and fabric for gates; details for various types of posts; top rails; top and bottom reinforcing wire; finish; details including tables concerning height, width, diameter, dimensions, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 39-1; 1943. Netting, Camouflage, Wire, Steel, Garnished With Fabric.

U. S. Gov., U. S. Army, Medical Department. Specification 10-2169A; 1941. Splint; Wire Gauze.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2979; 1940. Cover, Metal Wire, for Animal Jars.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-31; 1922. Trap; Fly.

References.—Methods of testing, general requirements for metals, *see* 600.1; zinc coatings and tests, *see* 600.3; wire lath, *see* 605.24; wire fabric for concrete reinforcement, *see* 605.25; motorcycle spokes, *see* 725.2; bed springs and wire fabric for beds, *see* 613.1.

603.5 CHAINS AND ATTACHMENTS

603.50 General Items

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Forged and Cast Steel Chains. Include rules for the inspection and testing.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R100-29; 1929. Welded Chain. Simplified practice recommended and accepted by industry in which the sizes and varieties listed in the publication are eliminated from the list of stock items formerly provided, including sizes of straight link proof coil and BB chain, breast chains, cart back chains, trace chains, wagon chains, chain dogs, ring dogs, heel chains, etc. Initiated by manufacturers now represented by the Chain Institute.

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types: (A) Welded (two grades—I, crane, wrought iron; and II, proof coil, wrought iron, or open-hearth steel); and (B) weldless (steel, copper, brass, or bronze); six classes for type A: (1) Close link, (2a) long link—buoy or submarine net, (2b) long link—conveyor or sprocket wheel, (3a) twist link—plain pattern, (3b) twist link—long-link pattern, and (3c) twist link—short-link pattern; twelve classes for type B: (1) Single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link—long pitch, (4b) flat link—short pitch, (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass—for mechanical communications; and eleven types of attachments: (A) Chain dogs—plain point, diamond point, (B) ring dog—diamond point, Norfolk pattern, plain, (C) hooks—vehicle and harness, slip, grab, hoist or sling, bale and box, barrel and stone hoist, hogshead, and can, (D) connecting links—one class, (E) repair or end-lap links—one class, (F) oval-side lap links—one class, (G) shackles—screw pin, anchor; screw pin, chain; oval pin, anchor; oval pin, chain; round pin, anchor; and round pin, chain, (H) rings—one class, (I) toggles—sheared, forged, (J) swivels—one class, and (K) sash—weight, socket. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

603.51 Long-Link Chains

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types: (A) Welded (two grades—I, crane, wrought iron; and II, proof coil, wrought iron, or open-hearth steel); and (B) weldless (steel, copper, brass, or bronze); six classes for type A: (1) Close link, (2a) long link—buoy or submarine net, (2b) long link—conveyor or sprocket wheel, (3a) twist link—plain pattern, (3b) twist link—long-link pattern, and (3c) twist link—short-link pattern; twelve classes for type B: (1) Single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link—long pitch, (4b) flat link—short pitch, (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass—for mechanical communications; and eleven types of attachments: (A) Chain dogs—plain point, diamond point, (B) ring dogs—diamond point, Norfolk pattern, plain, (C) hooks—vehicle and harness, slip, grab, hoist or sling, bale and box, barrel and stone hoist, hogshead, and can, (D) connecting links—one class, (E) repair or end-lap links—one class, (F) oval-side lap links—one class, (G) shackles—screw pin, anchor; screw pin, chain; oval pin, anchor; oval pin, chain; round pin, anchor; and round pin, chain,

(H) rings—one class, (I) toggles—sheared, forged, (J) swivels—one class, and (K) sash—weight, socket. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, general requirements for metals, *see* 600.1.

603.52 Short Link, Straight-Link Chains

American Society for Testing Materials, A 56-39; 1939. Iron and Steel Chain. Covers two classes; crane chain for slings, steam shovels and marine use where all-iron chain is wanted, and proof-coil for railroad cars, construction and forestry work, made from open-hearth steel. Gives method of welding, chemical composition, proof and break tests, elongation, test specimen, nominal weights and dimensions, workmanship and inspection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Iron and Steel Chain. Specifications M-301-44; 1944. Two classes, iron crane chain for slings, hoists, steam shovels, and marine uses; steel proof coil for railroad cars, construction and forestry work. Gives manufacture, chemical and physical properties and tests, standard weights and dimensions, workmanship and finish, marking, and inspection and rejection.

U. S. Gov., Federal Specification, RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types: (A) Welded (two grades—I, crane, wrought iron; and II, proof coil, wrought iron, or open-hearth steel); and (B) weldless (steel, copper, brass, or bronze); six classes for type A: (1) Close link, (2a) long link—buoy or submarine net, (2b) long link—conveyor or sprocket wheel, (3a) twist link—plain pattern, (3b) twist link—long-link pattern, and (3c) twist link—short-link pattern; twelve classes for type B: (1) Single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link—long pitch, (4b) flat link—short pitch, (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass—for mechanical communications; and eleven types of attachments: (A) Chain dogs—plain point, diamond point, (B) ring dogs—diamond point, Norfolk pattern, plain, (C) hooks—vehicle and harness, slip, grab, hoist or sling, bale and box, barrel and stone hoist, hogshead, and can, (D) connecting links—one class, (E) repair or end-lap links—one class, (F) oval-side lap links—one class, (G) shackles—screw pin, anchor; screw pin, chain; oval pin, anchor; oval pin, chain; round pin, anchor; and round pin, chain, (H) rings—one class, (I) toggles—sheared, forged, (J) swivels—one class, and (k) sash—weight, socket. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 6C3c; 1921. Chains; Boat.

References.—Standard sizes and varieties, *see* 603.50; methods of testing, general requirements for metals, *see* 600.1; heat treatments, *see* 600.5; classification of metals, *see* 600.2.

603.53 Stud-Link Chains

U. S. Gov., Federal Specification RR-C-251; 1933. Chain; Ship. Covers the stud-link type, for use as anchor, mooring, buoy, or towing chain; and three classes—(A) wrought iron, (B) forged steel, and (C) commercial wrought iron or forged steel. Gives requirements for material, workmanship, tolerances, arrangement of links and shackles, chemical composition, and physical properties; methods of sampling, inspection, and tests; and requirements for packing and marking.

References.—Standard sizes and varieties of chain, *see* 603.50; methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; heat treatments, *see* 600.5.

603.54 Twisted-Link Chains

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types: (A) Welded (two grades—I, crane, wrought iron; and II, proof coil, wrought iron, or open-hearth steel); and (B) weldless (steel, copper, brass, or bronze); six classes for type A: (1) Close link, (2a) long link—buoy or submarine net, (2b) long link—conveyor or sprocket wheel, (3a) twist link—plain pattern, (3b) twist link—long-link pattern, and (3c) twist link—short-link pattern; twelve classes for type B: (1) Single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link—long pitch, (4b) flat link—short pitch, (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass—for mechanical communications; and eleven types of attachments: (A) Chain dogs—plain point, diamond point, (B) ring dogs—diamond point, Norfolk pattern, plain, (C) hooks—vehicle and harness, slip, grab, hoist or sling, bale and box, barrel and stone hoist, hogshead, and can, (D) connecting links—one class, (E) repair or end-lap links—one class, (F) oval-side lap links—one class, (G) shackles—screw pin, anchor; screw pin, chain; oval pin, anchor; oval pin, chain; round pin, anchor; and round pin, chain, (H) rings—one class, (I) toggles—sheared, forged, (J) swivels—one class, and (K) sash—weight, socket. Gives requirements for material, workmanship, weights, design and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Standard sizes and varieties, *see* 603.50; methods of testing, general requirements for metals, *see* 600.1.

603.55 Straight and Twisted Link Vehicle Chains

Bar Reinforced Tire Chain Manufacturers. Bar Reinforced Tire Chain Specifications 8139; 1939. Covers reinforced tire chains in four types—(A) passenger car, four-link spacing; (B) single pneumatic, four-link spacing; (C) single pneumatic, two-link spacing; and (D) dual pneumatic with three side chains. Gives requirements for material and workmanship, finish and details for each type; and methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types: (A) Welded, two grades—(I) crane, wrought iron; and (II) proof coil, wrought iron, or open-hearth steel; and (B) weldless—steel, copper, brass, or bronze; six classes for type

A—(1) close link; (2a) long link, buoy or submarine net; (2b) long link, conveyor or sprocket wheel; (3a) twist link, plain pattern; (3b) twist link, long-link pattern; and (3c) twist link, short-link pattern; twelve classes for type B—(1) single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link, long pitch, (4b) flat link, short pitch; (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass, for mechanical communications; and eleven types of attachments—(A) chain dogs—plain point, diamond point; (B) ring dogs—diamond point, Norfolk pattern, plain; (C) hooks—vehicle and harness, slip, grab, hoist or sling, bale and box, barrel and stone hoist, hogshead, and can; (D) connecting links, one class; (E) repair or end-lap links, one class; (F) oval-side lap links, one class; (G) shackles—screw pin, anchor; screw pin, chain; oval pin, anchor; oval pin, chain, round pin, anchor; and round pin, chain; (H) rings, one class; (I) toggles—sheared, forged; (J) swivels, one class; and (K) sash—weight, socket. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing and marking.

U. S. Gov., Treasury Dept., Procurement Div., 437A; 1942. Chains; Tire, Antiskid (Standard and Reinforced Types). Covers two types of tire chains—(I) standard and (II) reinforced; and three classes—(A) passenger car chains, (B) single pneumatic chains, and (C) dual pneumatic chains. Gives requirements for material, finish, side chains, end hooks or lock fasteners, tolerances, physical requirements, sizes, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Standard sizes and varieties of chain, *see* 603.50; vehicle and harness hooks, *see* 603.57.

603.56 Weldless Chain, Various Link Patterns

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types: (A) Welded, two grades—(I) crane, wrought iron; and (II) proof coil, wrought iron, or open-hearth steel; and (B) weldless—steel, copper, brass, or bronze; six classes for type A—(1) close link; (2a) long link, buoy or submarine net; (2b) long link, conveyor or sprocket wheel; (3a) twist link plain pattern; (3b) twist link, long-link pattern; and (3c) twist link, short-link pattern; twelve classes for type B—(1) single-loop pattern; (2) double-loop pattern; (3) sash; (4a) flat link, long pitch; (4b) flat link, short pitch; (5) plumber's; (6) safety; (7) single jack; (8) double jack; (9) ladder; (10) register; and (11) brass, for mechanical communications; and eleven types of attachments—(A) chain dogs—plain point, diamond point; (B) ring dogs—diamond point, Norfolk pattern, plain; (C) hooks—vehicle and harness, slip, grab, hoist or sling, bale and box, barrel and stone hoist, hogshead, and can; (D) connecting links, one class; (E) repair or end-lap links, one class; (F) oval-side lap links, one class; (G) shackles—screw pin, anchor; screw pin, chain; oval pin, anchor; oval pin, chain; round pin, anchor; and round pin, chain; (H) rings, one class; (I) toggles—sheared, forged; (J) swivels, one class; and (K) sash—weight, socket. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Standard sizes and varieties, *see* 603.50; methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; transom chain, *see* 617.5.

603.57 Chain Attachments

U. S. Gov., Federal Specification RR-C-251; 1933. Chain; Ship. Covers the stud-link type, for use as anchor, mooring, buoy, or towing chain; and three classes—(A) wrought iron, (B) forged steel, and (C) commercial wrought iron or forged steel. Gives requirements for material, workmanship, tolerances, arrangement of links and shackles, chemical composition, and physical properties; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types: (A) Welded, two grades—(I) crane, wrought iron; and (II) proof coil, wrought iron, or open-hearth steel; and (B) weldless—steel, copper, brass, or bronze; six classes for type A—(1) close link; (2a) long link, buoy or submarine net; (2b) long link, conveyor or sprocket wheel; (3a) twist link, plain pattern; (3b) twist link, long-link pattern; and (3c) twist link, short-link pattern; twelve classes for type B—(1) single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link, long pitch, (4b) flat link, short pitch, (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass, for mechanical communications; and eleven types of attachments—(A) chain dogs—plain point, diamond point; (B) ring dogs—diamond point, Norfolk pattern, plain; (C) hooks—vehicle and harness, slip, grab, hoist or sling, bale and box, barrel and stone hoist, hogshead, and can; (D) connecting links, one class; (E) repair or end-lap links, one class; (F) oval-side lap links, one class; (G) shackles—screw pin, anchor; screw pin, chain; oval pin, anchor; oval pin, chain; round pin, anchor; and round pin, chain; (H) rings, one class; (I) toggles—sheared, forged; (J) swivels, one class; and (K) sash—weight, socket. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification RR-H-571; 1933. Hooks; Chain. Gives requirements for material, workmanship, sizes, and design; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Department. Specification 91-57; 1934. Link, Chain Repair.

References.—Standard sizes and varieties of chain, *see* 603.50; methods of testing, general requirements for metals, *see* 600.1; heat treatments, *see* 600.5.

603.59 Miscellaneous Chains

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and attachments; Standard, Miscellaneous. Covers two types: (A) Welded, two grades—(I) crane, wrought iron; and (II) proof coil, wrought iron, or open-hearth steel; and (B) weldless—steel, copper, brass, or bronze; six classes for type A—(1) close link, (2a) long link, buoy or submarine net; (2b) long link, conveyor or sprocket wheel; (3a) twist link, plain pattern; (3b) twist link, long-link pattern; and (3c) twist link, short-link pattern; twelve classes for type B—(1) single-loop pattern; (2) double-loop pattern; (3) sash; (4a) flat link, long pitch; (4b) flat link, short pitch; (5) plumber's; (6) safety; (7) single jack; (8) double jack; (9) ladder; (10) register; and (11) brass, for mechanical communications; and eleven types of attachments—(A) chain dogs—plain point, diamond point; (B) ring dogs—diamond point, Norfolk pattern, plain; (C) hooks—vehicle and harness, slip, grab, hoist or sling, bale and box, barrel and stone hoist, hogshead, and can; (D) connecting links, one class; (E) repair or end-lap links, one class; (F) oval-side lap links, one class; (G) shackles—screw pin, anchor; screw pin, chain; oval pin, anchor; oval pin, chain; round pin, anchor; and round pin, chain; (H) rings, one class; (I) toggles—sheared, forged; (J) swivels, one class; and (K) sash—weight, socket. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing and marking.

U. S. Gov., Navy Dept. Specification 23C4; 1939. Chains; Collision-Mat.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-79; 1936. Chain; Spur.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-97; 1941. Chain; Tie-in, for Range, Field, M-1937.

References.—Roller chain, silent transmission chains, *see* 766.1.

603.6 HORSESHOES

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-69A; 1932. Shoe; Horse and Mule.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-59; 1942. Calks; Toe, Horseshoe.

References.—Standard shoe for horseshoe pitching, *see* 943.5.

604. IRON AND STEEL PLATES AND SHEETS

604.0 GENERAL ITEMS

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 195; 1944. Steel Sheet and Strip—Preferred Thicknesses. Gives table showing preferred thicknesses for uncoated metals and alloys. From ASA preferred thicknesses B32.1-1941. Developed by National Aircraft Standards Committee.

American Society of Mechanical Engineers, joint sponsor with Society of Automotive Engineers. American Standards Assn., B32.1-1941. Preferred Thickness for Uncoated Thin Flat Metals (Under 0.250 In.). A simplified system for designating the thickness of uncoated thin flat metals and alloys by decimal parts of an inch, thus eliminating the confusion caused by the various gage number systems.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention Nos. 7.16 (1938), 7.17 (1939), 7.18 (1939), 7.19 (1939), and 7.20 (1939). Anchorage of Steel-Deck Roofs. A series of bulletins showing details of wind-anchorage methods for various types of steel-deck roofs.

Society of Automotive Engineers. 1942 Handbook, Section 3—Processed Materials. S. A. E. Standard Steels. The steel compositions included in this standard are considered adequate for practically all parts made of ferrous materials that are necessary for the production of automotive apparatus, and include grades that have been found commercially available and technically adequate for the service required of such parts. Includes general instructions, explanation of S. A. E. numbering system, chemical compositions, methods of sampling for check analysis, method of determining hardenability, grain size charts for classification of steel, magnaflux testing, determination of inclusions, general characteristics and heat treatments, tension test specimens, physical properties, hardness tests, and definition of heat treating terms.

604.1 IRON AND STEEL PLATES

604.10 General Items

American Iron and Steel Institute. Steel Products Manual, Section 6; 1938. Revised, 1943. Carbon-steel Plates. Gives general definitions, rules for ordering, ordinary manufacturing practices, special manufacturing practices, general standard practices, chemical requirements, standard methods of sampling for check analysis, methods of analysis, and standard mill practices.

604.11 Steel Plates for Pressure Vessels

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Boiler Material. Include rules for inspection and tests.

American Society for Testing Materials, A30-44; 1944. A. S. M. E. Boiler Construction Code Specification SA-30. Boiler and Firebox Steel for Locomotives. Includes steel plates up to 2 in. of flange and firebox qualities for boilers of locomotives. Covers process, chemical composition, ladle analysis, check analysis, physical properties, bending properties, homogeneity test, test specimens, number of tests, permissible variations in weight and thickness, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 70-44; 1944. A. S. M. E. Boiler Construction Code Specification SA-70. American Standards Assn., G29.1-1944. Carbon Steel Plates for Stationary Boilers and Other Pressure Vessels. Covers plates of flange and firebox qualties for boilers and other pressure vessels, suitable for fusion welding. Gives requirements for heat treatment, chemical composition, ladle analysis, check analysis, physical properties, bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, rejection, and rehearing. A. S. T. M. Emergency Alternate Provision EA-A 70a; 1944, affected section 4 chemical composition, and section 7 tensile properties.

American Society for Testing Materials, A 89-43; 1943. A. S. M. E. Boiler Construction Code Specification SA-89. American Standards Assn., G 30.1-1943. Low Tensile Strength Carbon-Steel Plates of Flange and Firebox Qualties. For two grades of steel, suitable for fusion welding, and with modifications for forge welding. Gives requirements for chemical composition, ladle analysis, tensile and bending properties, homogeneity test, test specimen, permissible variations in thickness and weight, finish and inspection. A.S.T.M. Emergency Alternate Provisions EA-A 89; 1943, affected table I, sulfur content.

American Society for testing Materials, A 129-39; 1939. A.S.M.E. Boiler Construction Code Specification SA-129. Open-Hearth Iron Plates of Flange Quality. Covers three types of iron plates; requirements as to chemical composition, ladle analysis, tensile and bending properties, preparation of test specimen, permissible variations in thickness and weight, finish, and inspection.

American Society for Testing Materials, A 201-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-201. American Standards Assn., G31.1-1944. Carbon-Silicon Steel Plates of Ordinary Tensile Ranges for Fusion-Welded Boilers and Other Pressure Vessels. Covers two grades for use in locomotive and stationary boilers and other pressure vessels. Gives requirements for heat treatment, chemical composition, ladle analysis, check analysis, tensile and bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 202-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-202. American Standards Assn., G32.1-1944. Chrome-Manganese-Silicon (CMS) Alloy-Steel Plates for Boilers and Other Pressure Vessels. For two ranges of high tensile strength plates, for maximum workability, and for use without heating. Gives requirements for chemical composition, ladle analysis, check analysis, physical and bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, marking, inspection, and rejection.

American Society for Testing Materials, A 203-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-203. American Standards Assn., G33.1-1944. Low-Carbon Nickel-Steel Plates for Boilers and Other Pressure Vessels. For three tensile strength ranges of plates not over 2 in. in thickness, of flange and ordinary firebox qualities, for use in locomotive boiler shells, boilers for stationary service, and other pressure vessels. Gives chemical composition, ladle analysis, check analysis, physical properties, bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 204-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-204. American Standards Assn., G34.1-1944. Molybdenum-Steel Plates for Boilers and Other Pressure Vessels. For three high tensile strength ranges for fusion welding, for use in locomotive boiler shells, stationary boilers, and other pressure vessels. Gives maximum thickness for various grades, heat treatment, chemical composition, ladle analysis, check analysis, physical properties, bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 212-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-212. American Standards Assn., G35.1-1944. High Tensile Strength Carbon-Silicon Steel Plates for Boilers and Other Pressure Vessels, Plates 4 1/2 In. and Under in Thickness. Covers two ranges of high tensile strength plates, suitable for fusion welding. Gives requirements for heat treatment, chemical composition, ladle analysis, check analysis, tensile and bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 225-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-225. Manganese-Vanadium Steel Plates for Boilers and Other Pressure Vessels. Covers two grades of plates in high-tensile strength ranges primarily for fusion welding, for use in locomotive boiler shells, boilers for stationary service, and other pressure vessels. Gives heat treatment, chemical composition, ladle analysis, check analysis, tensile and bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, and rejection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Emergency Specification E-M-115-43; 1943. Changed A.A.R. Specification M-115-38, Steel, Boiler and Fire-Box for Locomotives, section 1 (scope), section 13 (weight), and section 15 (marking).

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Specification M-115-38; 1938. Steel, Carbon, Boiler and Fire-Box for Locomotives. Covers two classes of carbon steel for boilers for locomotives, namely, flange and fire-box. Gives requirements for manufacture, chemical properties and tests, physical properties and tests, permissible variations in weight and thickness, finish, marking, inspection, rejection, and rehearing.

U. S. Gov., Federal Specification QQ-S-691; 1932. Steel; Plates, Marine Boiler. Covers three classes—A, B, and C. A and B shall be made by open-hearth process, and steel for class C may be made by the Bessemer process. Gives requirements for surface defects, shearing, permissible variations, and chemical composition, including methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 46S19a; 1933. Steel; Staybolt (Boiler).

U. S. Gov., Navy Dept. Specification 47S23; 1939. Steel; Plate, Boiler, Molybdenum-Alloy.

U. S. Gov., Navy Dept. Specification 48P2h; 1939. Steel; Plate, Marine-Boiler.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for two grades of carbon-steel of flange and firebox qualities (suitable for fusion and for forge welding)—process, chemical compositions, tensile properties, bending properties, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, and manufacturer's certification. In substantial agreement with American Society for Testing Materials Standard Specification A89.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for seven grades (two qualities in each) of marine boiler steel plates subject to a class A inspection—(A) and (B) two ordinary tensile-strength ranges in carbon-silicon steel plates; (C) and (D) two high tensile-strength ranges in carbon-silicon steel plates; (E), (F), and (G) three high tensile-strength ranges in carbon-molybdenum steel plates. Gives chemical compositions, tensile properties, modifications in elongation, bending properties, test specimens, number of tests, finish, and marking. In substantial agreement with American Society for Testing Materials Standard Specifications A201, A212, and A204.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; standard thicknesses, *see* 604.0; standard sheet sizes, tolerances on weight and thickness, *see* 604.10; powder boilers, water heaters, tanks, *see* 703, 614, 605.23, 956.2.

604.12 Steel Plates for Nonpressure Tanks and Stacks

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; standard thicknesses, *see* 604.0; standard sheet sizes, tolerances on weight and thickness, *see* 604.10; alloy steel plates for tank cars, *see* 621.32; steel tanks, *see* 605.23, 956.2, 726.1.

604.13 Steel Plates for Ship Hulls

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Iron Plates and Shapes. Include rules for inspection and testing.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; standard thicknesses, *see* 604.0; standard sheet sizes, tolerances on thickness and weight, *see* 604.10; other structural steel for ships, *see* 605.15.

604.14 Wrought-Iron Plates

American Society for Testing Materials, A 42-39; 1939. American Assn. of State Highway Officials, M 99-39. A.T.E.A. Standard E 20-39. Wrought-Iron Plates. Covers standard and special forming plates for general fabrication purposes, including bending and flanging. Gives method of manufacture, chemical composition, tensile and bending properties, test specimen, variations in thickness and weight permitted, and inspection.

American Transit Assn. Standard Specification for Wrought Iron Plates, E20-39; 1939. This specification covers standard and special forming wrought iron plates for general fabrication purposes, including bending and flanging, in thicknesses 3/16 in. and over. Covers the manufacture of plates, chemical composition, physical properties and tests, variations in weight and thickness, finish, marking, and inspection and rejection.

U. S. Gov., Navy Dept. Specification 47-I-5a; 1945. Iron, Wrought: Plates, Black.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; standard thicknesses, *see* 604.0; standard sheet sizes, tolerances on weight and thickness, *see* 604.10.

604.19 Miscellaneous Iron and Steel Plates

American Society for Testing Materials, A 10-39; 1939. American Standards Assn., G20-1939. Mild Steel Plates. Covers mild grade of steel for general plate construction. Requirements as to chemical composition, ladle analysis, tensile properties, elongation, bending, method of preparing test specimen, permissible variations in weight and thickness, finish, and inspection.

American Society for Testing Materials, A 78-43; 1943. American Standards Assn., G40.1-1943. Low Tensile Strength Carbon-Steel Plates of Structural Quality for Welding. For two grades of structural steel suitable for welding, including modifications for forge welding. Covers chemical composition, ladle analysis, tensile and bending properties, elongation, test specimen, permissible variations in weight and thickness, finish, and inspection.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-676-1; 1942. Steel; Carbon-and-Alloy, Low, Plate, Sheet, and Strip.

U. S. Gov., Navy Dept. Specification 47S18b; 1944. Steel Plates and Sheets, Floor, Rolled.

U. S. Gov., Navy Dept. Specification 47S22; 1937. Steel; Corrosion-Resisting, Plate and Sheet, Floor, Rolled.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appuretenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for carbon-steel plates up to 4 in. thickness; of flange and firebox qualities (suitable for fusion welding)—process, heat treatment, chemical composition, tensile properties, modifications in elongation, bending properties, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, and manufacturer's certification.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-113; 1944. Steel; Plates and Sheets, Rolled, Floor.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-114-1A; 1942. Steel; Plain Carbon and Low-Alloy High-Tensile, Plate, Shape, Sheet, Strip and Rectangular Bars, for Welded Structures.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-115-1A; 1936. Armor Plate; Light, for Testing Small-Arms Armor-Piercing Bullets.

References.—For plates classifiable under sheets, *see* 604.2; structural carbon steel plates, *see* 605.1; structural alloy steel plates, *see* 621.32; methods of testing, general requirements for metals, *see* 600.1; standard thicknesses, *see* 604.0; standard sheet sizes, tolerances on weight and thickness, *see* 604.10.

604.2 IRON AND STEEL SHEETS

604.20 General Items

American Iron and Steel Institute. Manufacturers' Standard Practice. Supplementary Information. Section 11. Carbon Steel Sheets. Includes table of approximate thickness equivalent of galvanized sheet gage numbers.

American Iron and Steel Institute. Steel Products Manual. Carbon-Steel Sheets, Hot- and Cold-Rolled, 1940. Manufacturers' standard practice for variations in dimensions and workmanship, with tables of gage numbers, weights, and thicknesses. Includes blued sheets and sheets for porcelain enameling.

American Iron and Steel Institute. Steel Products Manual, Section 11; 1942. Carbon Steel Sheets. Gives general definitions and manufacturing practices; chemical practices; standard mill practices; and standard methods for packaging, loading, and shipping flat steel sheets.

American Iron and Steel Institute. Steel Products Manual, Section 11a; 1941. Sheet Steel, Standard Packages. Methods for packing, loading, and shipping flat steel sheets.

American Iron and Steel Institute. Steel Products Manual. Section 14a; 1940. Standard Packages for Tin Mill Products. Construction of standard platforms, ordinary packaging practices, boxing, and illustrations.

American Society of Mechanical Engineers. American Standards Assn., B32.1-1941. Preferred Thicknesses for Uncoated, Thin Flat Metals (Under 0.250 In.). Provides a simplified system for designating the thickness of uncoated, thin flat metals and alloys by decimal parts of an inch. Gives table of preferred thicknesses.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1943. Emergency Specification E-M-117-43, Modifies A. A. R. Specification M-117-42, Steel Sheets and Thin Plates, Carbon, by changing the check analysis for carbon, phosphorus, and sulphur content.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Steel Sheets and Thin Plates, Carbon, M-117-42; 1942. Covers all uncoated sheet steel, carbon, for locomotives, freight and passenger cars. Size and tolerance, composition, analysis, bend test, limits of variation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R28-29; 1929. Sheet Metal. This recommendation establishes a schedule of stock sizes of sheet steel in various gages. The recommendation also includes the U. S. Standard Gage for Sheet and Plate Iron and Steel as adopted by Congress, as applied to steel sheets, and the galvanized sheet gage as applied to galvanized steel sheet. Sponsored by the National Association of Sheet Metal Distributors and National Wholesale Hardware Association.

U. S. Gov., Navy Dept. Specification 47M1d; 1943. Metal; Expanded (Steel).

604.21 Iron and Steel Sheets for Magneto Electric Apparatus

604.22 Iron and Steel Strips, Bands, and Hoops

American Iron and Steel Institute. Steel Products Manual, Section 12; 1942. Hot-Rolled Carbon Strip Steel. Gives definitions and classifications, methods of manufacture, quality classifications, shape and dimensions, chemical composition, physical properties, tolerances, and manufacturing practices.

American Iron and Steel Institute. Steel Products Manual, Section 13; 1942. Cold-Rolled Carbon Strip Steel. Covers flat size classifications, methods of manufacture, manufacturing practices, methods of specifying, and limits for chemical compositions.

American Society for Testing Materials, A 109-38; 1938. Cold-Rolled Strip Steel. For five grades varying from full hard to dead soft; requirements as to chemical composition, bending properties, and permissible size variations. Includes appendix giving approximate physical properties of various tempers of material.

Society of Automotive Engineers. Aeronautical Material Specification 5040 C; 1944. Steel Sheet and Strip; Low Carbon. Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections. Similar specification: S. A. E. 1010.

Society of Automotive Engineers. Aeronautical Material Specification 5042B; 1942. Steel Sheet and Strip, Forming, Low-Carbon. Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections. Similar specifications: S. A. E. 1010; A. S. T. M. A109-38, grade No. 4.

Society of Automotive Engineers. Aeronautical Material Specification 5044; 1942. Steel Sheet and Strip, Low-Carbon, Half-Hard. Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections. Similar specification: S. A. E. 1010; A. S. T. M. A109, grade No. 2.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-666-1; 1942. Steel; Carbon (1095), Sheet-and-Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-676-1; 1942. Steel; Carbon-and-Alloy, Low, Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-11; 1942. Steel; Sheet and Strip Carbon (1020 and 1025).

U. S. Gov., Federal Specification QQ-S-636; 1941. Steel; Carbon (Low-Carbon), Sheets and Strips. Gives classification by size of flat-rolled steel. Covers hot-rolled sheets and strips in two conditions—as rolled and annealed; and three finishes—as rolled or annealed (depending on condition), pickled and oiled, and pickled and limed; cold-rolled strips in five conditions—(1) hard, (2) half-hard, (3) quarter-hard, (4) soft-skin rolled, and (5) dead soft; and three finishes—dull, regular bright, and best bright; and cold-rolled sheets in two conditions—(4) soft-skin rolled, and (5) dead soft; and two finishes—dull and regular bright. Gives requirements for material and workmanship, finish, chemical composition, physical properties, dimensions and permissible variations, and edges; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification QQ-S-781a; 1942. Amendment 2; 1944. Strapping, Flat; Steel. Covers two types—(I) nailless and (II) nail-on; and three classes—(A) coated finish, (B) galvanized (zinc coated), and (C) uncoated. Gives requirements for sizes, finish, ductility, material, applicability, breaking strength, tolerances, coils, and cut lengths; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification QQ-S-790; 1944. Strapping, Round; Steel, Bare and Zinc-Coated. Covers two classes—(A) 140,000 lb. per sq. inch. tensile strength and (B) 100,000 lb. per sq. in. tensile strength. Gives requirements for finishes, sizes, material, workmanship, applicability, diameter, breaking strength and elongation, finish, coils, and cut lengths; methods of inspection, sampling, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 47S11e; 1944. Steel and Iron: Sheets and Strips for Flanging, Cupping, and Drawing.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-136-1C; 1939. Steel, Strip, for Metallic Belt Links.

References.—Methods of testing, general requirements for metals, see 600.1; standard thicknesses, *see* 604.0; standard sheet sizes, tolerances on weight and thickness, *see* 604.20; barrels and tanks, *see* 951., 956.2; barrel hoops, *see* 421.3.

604.23 Iron and Steel Sheets for Drawing and Forming

Society of Automotive Engineers. Aeronautical Material Specification 5040 C; 1944. Steel Sheet and Strip; Low Carbon. Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections. Similar Specifications: Federal QQ-I-696, Type I; S.A.E. 1010.

Society of Automotive Engineers. Aeronautical Material Specification 5041; 1944. Steel, Sheet and Strip—Extra Deep Drawing (Special Quality) Low Carbon. Covers composition, condition, tensile strength, yield strength, elongation, quality, tolerances, reports, identification, and rejections. Similar Specification: S.A.E. 1006.

Society of Automotive Engineers. Aeronautical Material Specification 5042B; 1942. Steel Sheet and Strip, Forming, Low-Carbon. Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections. Similar specifications: S.A.E. 1010; A.S.T.M. A109-38, grade No. 4.

Society of Automotive Engineers. Aeronautical Material Specification 5043; 1944. Steel, Sheet and Strip—Forming (Special Quality) Low Carbon. Covers composition, condition, tensile strength, yield strength, elongation, quality, tolerances, reports, identification, and rejections. Similar Specification: S.A.E. 1010.

Society of Automotive Engineers. Aeronautical Material Specification 5044; 1942. Steel Sheet and Strip, Low-Carbon, Half-Hard. Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections. Similar Specifications: S.A.E. 1010; A.S.T.M. A109-38, grade No.2.

U. S. Gov., Navy Dept. Specification 47S11e; 1944. Steel and Iron: Sheets and Strips for Flanging, Cupping, and drawing.

U. S. Gov., Navy Dept. Specification 47S16; 1928. Steel, Sheet, for the Manufacture of metal Furniture.

U. S. Gov., Treasury Dept., Procurement Div., 288; 1938. Steel; Sheet, for the Manufacture of Metal Furniture. Sheets shall be of one grade, full pickled, full cold-rolled, reannealed, bright, smooth, free from rust, scale, pits, scratches, and buckles. Gives requirements for weights per sq. ft., thickness, permissible variations in weight, width, and length; methods of sampling, inspection, and tests; and packing and marking.

References.—See references under 604.22.

604.24 Spring and Tool Steel Sheets

Society of Automotive Engineers. Aeronautical Material Specification 5120; 1942. Steel Sheet and Strip (Spring-Annealed). Covers requirements for composition (.65-.75 carbon, etc.) condition, quality, tolerance, reports, and rejection. Similar to Society of Automotive Engineers Specification 1070.

Society of Automotive Engineers. Aeronautical Material Specification 5121; 1942. Steel Sheet and Strip (Spring-Annealed). Covers requirements for composition (.90-1.05 carbon, etc.), condition, quality, tolerances, reports, and rejections. Similar to U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-666, and Society of Automotive Engineers Specification 1095.

604.25 Iron and Steel Sheets for Automotive and Railway Use

Society of Automotive Engineers. Aeronautical Material Specification 5122; 1940. Steel Sheet or Strip, Hard (High-Carbon, Hard). Gives requirements for composition, condition, quality, tolerances, reports, and rejections.

References.—Other iron and steel sheets for automotive and railway use, see 604.22 and 604.23; see ferro-alloy, 621.32; see ferrotungsten, 621.25; see references under 604.22.

604.26 Iron and Steel Sheets for Roofing

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R78-28; 1928. Iron and Steel Roofing. This recommendation establishes a list of standard sizes, covering widths, lengths, gage thicknesses, and weights for galvanized sheets, and pointed sheets, corrugated, roll, V-crimp, and pressed standing seam types. Initiated by National Wholesale Hardware Assn.

604.29 Iron and Steel Sheets for Miscellaneous Purposes

American Society for Testing Materials, A 162-39; 1939. American Standards Assn., G23-1939. Uncoated Wrought-Iron Sheets. For use in roofing, siding, for corrugating and moderate forming, but not for deep drawing or excessive forming. Requirements for manufacture, chemical composition, bending tests, specimen for test, weight, dimensions, and permissible variations, and inspection.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention Nos. 7.16, 1938; 7.17, 1939; 7.18, 1939; 7.19, 1939; and 7.20, 1939. Anchorage of Steel-Deck Roofs. A series of bulletins showing details of wind-anchorage methods for various types of steel-deck roofs.

Society of Automotive Engineers. Aeronautical Material Specification 5036; 1943. Steel Sheet and Strip; Low-Carbon (Aluminum Coated). Chemical composition, condition, quality, tolerance, reports, identification, and rejection.

U. S. Gov., Army Air Forces. Specification 10246; 1944. Iron; Sheet (for Porcelain Enameling).

U. S. Gov., Navy Dept. Specification 47I4; 1942. Iron, Wrought; Sheet, Black and Zinc-Coated (Galvanized).

U. S. Gov., Navy Dept. Specification 47S28; 1942. Steel; Sheet, Common, Black.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-114-1A; 1942. Steel; Plain Carbon and Low-Alloy High-Tensile, Plate, Shape, Sheet, Strip, and Rectangular Bars, for Welded Structures.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-136B; 1941. Steel; Sheet and Strip, Carbon and Alloy.

References.—Tin and zinc coated sheets, *see* 604.3; for sheets classifiable under plates, *see* 604.1; structural carbon and alloy steel sheets and plates, *see* 605.1, 621.32; methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; standard thicknesses, *see* 604.0; standard sheet sizes, tolerances on weight and thickness, *see* 604.20.

604.3 TIN COATED AND ZINC COATED SHEETS

604.31 Tin Coated Sheets (Roofing Tin Terne-plate)

American Iron and Steel Institute. Steel Products Manual. Long Terne Sheets, 1940. Manufactures' standard practice for variations in commercial and full finished long terne sheets, in weight of coating, dimensions, camber, and coating weights per double box. Includes roofing ternes of copper steel with table of weights and thickness.

American Iron and Steel Institute. Steel Products Manual, Section 14; 1940. Tin Mill Products. For tin plate, terne plate, and black plate; manufacturing processes, definitions, standard gages, classes of black plate, tin plate, and terne plate.

Underwriters' Laboratories, Inc. Standard for Tin-Clad Fire Doors and Shutters, 1941. For tin-clad fire doors and shutters entitled to classification as being in compliance with Standards of Underwriters' Laboratories, Inc. For one or more of the situations defined in the Standards of the National Board of Fire Underwriters for the Protection of Openings in Walls and Partitions Against Fire. Materials, construction, conduct of factory inspection work and methods and procedures for tests, and standard method for the determination of weight and composition of coating on terne plate for tin-clad doors and shutters.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R30-42; 1942. Roofing Ternes. This recommendation establishes a simplified schedule for roofing ternes, a packaging schedule, and a method of marking roofing ternes in rolls. Initiated by the National Assn. of Sheet Metal Distributors and National Wholesale Hardware Assn.

U. S. Gov., Federal Specification QQ-I-706a; 1941. Amendment 1; 1942. Iron and Steel; Sheet, Tinned (Tin-Plate). Covers three types—(I) standard or general purpose plate, (II) drawing quality, and (III) hard; and two grades—(1) "primes" only, and (2) "primes" with "seconds" up to 25 percent of quantity ordered. Gives requirements for base sheets, tinning, defects, dimensions, base weight, permissible variations in base weight, physical requirements, weight of coating, and grades; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-T-191; 1933. Amendment 1; 1934. Terne-Plate (Long Ternes). Covers three types—(I) standard, (II) deep drawing, and (III) extra deep drawing; four classes—(A) standard, (B) 12 lb. (C) 15 lb., and (D) 40 lb.; and two grades—(1) primes only and (2) primes with seconds. Gives requirements for material, workmanship, dimensions, gage weight, and details for physical requirements, coating, and grades; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification QQ-T-201; 1930. Amendment 1; 1941. Terne-Plate (Roofing Tin). Covers one type and the grade shall be prime sheets. Gives requirements for base metal, black sheets, coated sheets; coating, resquaring, tolerances, bending and seaming qualities, and weights of sheets; methods of sampling, inspection, and tests; packaging, packing, and marking.

References.—Methods of testing, general requirements for metals, *see* 600.1; coatings and tests of coatings, *see* 600.3; standard sheet sizes, tolerances on weight and thickness, *see* 604.20.

604.32 Zinc-Coated (Galvanized) Steel Sheets

American Iron and Steel Institute. Steel Products Manual. Galvanized Sheets, 1940. Manufacturers' standard practice for variations in dimensions and workmanship, with tables of gage numbers, weights, and commercial variations in coating.

American Society for Testing Materials, A 93-27; 1927. American Standards Assn. G8b1-1931. Zinc-Coated (Galvanized) Iron or Steel Sheets. Covers five classes of zinc coatings applied by hot-dip process based on thickness of coating, and amount of bending required. Chemical composition, weight of coating, bend test, test specimen, permissible variations in dimensions, and gage of sheets based on weight.

American Society for Testing Materials, A 93-38 T; 1938. Tentative Specifications for Zinc-Coated (Galvanized) Iron or Steel Sheets. Covers Zinc-coated (galvanized) by the hot-dip process. Does not cover tests of commercial coatings for general utility. Interpretation of numerical requirements, manufacture, chemical composition, weight of coating, bend tests, permissible variations, finish, marking, inspection, rejection, and rehearing.

American Society for Testing Materials, A 163-39; 1939. Zinc-Coated (Galvanized) Wrought-Iron Sheets. For use in culverts, roofing, siding, for corrugating, moderate forming, with four classes of zinc coating applied by the hot-dip process. Gives method of manufacture, chemical composition, weight of various coatings, bending properties, test specimen, weight, dimensions and permissible variations, finish, and inspection.

American Society for Testing Materials, A 164-40 T; 1940. Tentative Specifications for Electrodeposited Coatings of Zinc on Steel. Includes three types of coatings to withstand corrosion; requirements for manufacture, thickness of coating, significant surfaces, selection of samples, test for thickness of coating, and time required for plating. Prepared jointly by the American Electro-Platers' Society, the National Bureau of Standards, and the A.S.T.M.

American Society for Testing Materials, A 239-41; 1941. American Assn. of State Highway Officials, T 66-42. Method of Test for Uniformity of Coating by the Preece Test, Copper Sulfate Dip, on Zinc-Coated, Galvanized, Iron or Steel Articles. For determination of thinnest portions of coating, but not for relative weight of coatings. Includes solution, test specimen, outline of procedure, end point, and applications of methods.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Galvanized Sheets, M-119-40; 1940. For all purposes of galvanized steel usage, chemical and physical properties and tests, including a table of standard gages, weights, and weight of coating.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R78-28; 1928. Iron and Steel Roofing. This recommendation establishes a list of standard sizes covering widths, lengths, gage thicknesses, and weights for galvanized sheets and painted sheets, corrugated, roll, V-crimp, and pressed standing seam types. Initiated by the National Wholesale Hardware Assn.

U. S. Gov., Federal Specification QQ-I-716; 1942. Iron and Steel; Sheet, Zinc-Coated (Galvanized). Covers two types—flat and corrugated; and seven classes: (A) Extra heavily coated, (B) heavily coated, (C) moderately heavily coated, (D1) ordinary coated—hot-dipped, (D2) ordinary coated—electroplated, (E1) lightly coated for severe forming—hot-dipped, and (E2) lightly coated for severe forming—electroplated. Gives requirements for preparation for painting, base material, manufacture, workmanship, gage weights, and tolerances, coating weight or thickness, bending, seaming, forming, corrugated sheets, and paint adherence; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 47S29b; 1945. Steel; Sheet, Zinc-Coated (Galvanized).

U. S. Gov., Navy Dept. Specification 47-I-4; 1942. Iron, Wrought; Sheet, Black and Zinc-Coated (Galvanized).

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Galvanized, Flat Iron or Steel Sheets for Standing Seam Roofing, 1937.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Galvanized Iron or Steel Flat Sheets, 1937.

References.—Methods of testing, general requirements for metals, *see* 600.1· coatings and tests of coatings, *see* 600.3; standard sheet sizes, tolerances on weight and thickness, *see* 604.20.

605. STRUCTURAL IRON AND STEEL

605.0 GENERAL ITEMS

American Institute of Architects, Document 172; 1942. Filing Information on Building Materials, Appliances, and Equipment. To simplify the filing problem of architects, engineers, landscape architects, contractors, and others desirous of selecting and filing for convenient reference not only the catalogs and other descriptive literature distributed by manufacturers and producers of building materials, appliances and equipment, but other informative material referring to building and construction and related activities. Classifications and file numbers are arranged under 41 major divisions. Provides a filing system with the necessary flexibility and comphehensive alphabetical index.

American Institute of Steel Construction. Code of Standard Practice for Steel Structures Other than Bridges; 1937. Covers classification of steel and iron, invoicing of weights, drawings and specifications, inspection and delivery, method of erection, delays and extra work, proposals and contracts.

American Iron and Steel Institute. Steel Products Manual, Section 4, 1943. Carbon Steel Structural Sections. Covers part I, general definitions and manufacturing practices; part II, chemical limits and ranges, permissible variations for check analyses, and methods of sampling for check analyses; part III, permissible variations for dimensions and workmanship; part IV, standard methods of loading; and part V, national emergency simplified list of structural shapes.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1939. Instructions for the Mill Inspection of Structural Steel. A set of general instructions to be used in connection with the mill inspection of structural steel.

National Association of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2, 1944. Steel; Structural. Covers definition, classification, size ranges, and quotations.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Steels. The steel compositions included in this standard are considered adequate for practically all parts made of ferrous materials that are necessary for the production of automotive apparatus, and include grades that have been found commercially available and technically adequate for the service required of such parts. Includes general instructions, explanation of S.A.E. numbering system, chemical compositions, methods of sampling for check analysis, method of determining hardenability, grain size charts for classification of steel, magnaflux testing, determination of inclusions, general characteristics and heat treatments, tension test specimens, physical properties, hardness tests, and definition of heat treating terms.

605.1 STRUCTURAL SHAPES AND PLATES, NOT FABRICATED

American Iron and Steel Institute. National Emergency Specifications, 1943. Simplification of Structural

Steel Shapes. The simplified list of structural steel shapes given herein is that referred to in Paragraph (b) of Schedule 4 to Limitation Order L-211 of the War Production Board. Gives nominal dimensions and weight per foot of beams, columns, channels, angles, zees, tees, and miscellaneous shapes.

605.11 Structural Steel for Bridges

American Institute of Steel Construction. Applications of Structural Steels and Light-Weight Alloys for Bridges, Buildings, and Similar Structures, 1943. Gives requirements for physical and mechanical properties, fabrication and usability characteristics, forming and bending, riveting, welding, corrosion, aluminum, magnesium, stainless steel, low-alloy structural steel, sheet steel for structural purposes, standard structural carbon steel, and general conclusion.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Structural Steel and Iron. Gives requirements for loads and forces, unit stresses, design, fabrication, inspection, weighing, shipping, and erection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1938. Structural Silicon Steel. Gives process, discard, chemical composition, ladle analyses, check analyses, physical properties, modification in ductility, yield point, bend tests, test specimens, number of tests, retests, permissible variations in weight and thickness, finish, identification marks, inspection, and rejection. Identical with the requirements for the same material in A.S.T.M. No. A94.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Welded Structural Steel. Includes the furnishing, fabrication, erection, inspection, and in some instances the design of structural steel. Gives general requirements, material, loads and forces, unit stresses, design, fabrication, inspection, weighing and shipping, and erection.

American Society of Mechanical Engineers, Boiler Construction Code, 1940. Specifications for Steel Bars (S-7). Based on American Society for Testing Materials Specification A7.

American Society for Testing Materials, A 7-42; 1942. American Association of State Highway Officials, M 94. American Standards Assn., G24-1942. Steel for Bridges and Buildings. Covers carbon-steel of structural quality for use in the construction of bridges and buildings and for general structural purposes. Requirements as to castings, rivet steel, forgings, structural bolts, and rolled base plates; chemical composition, tensile and bending properties, preparing of test specimen, permissible variations in weight and thickness, finish, and inspection.

American Society for Testing Materials, A 94-39; 1939. American Association of State Highway Officials, M 95-39. American Standards Assn., G41.1-1942. Structural Silicon Steel. Covers special high strength structural steel for use as main stress-carrying structural members. Gives requirements for chemical composition, ladle analysis, tensile properties, elongation, bending, test specimen, permissible variations in weight and thickness, finish, and inspection.

U. S. Gov., Federal Specification QQ-S-741; 1942. Amendment 2; 1944. Steel, Structural (Including Welding) and Rivet; for Bridges and Buildings. Covers type I, for riveted structures; type II, for welded structures; grade A, bridge steel; grade B, building steel; class 1, noncopper steel; and class 2, copper-bearing steel. Gives material, workmanship, general requirements, manufacture, chemical composition, manufacturer's analyses, tensile properties, modification in elongation, and bending; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Federal Works Agency, Public Works Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Steel Bridges.

References.—Alloy structural steel, *see* 621.31, 621.32, 621.33; methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; zinc coatings for structural steel, *see* 600.3; tolerances on weight and thickness of plates and bars, *see* 600.7; standard thicknesses of sheets and plates, *see* 604.0; standard sheet sizes, *see* 604.10, 604.20; rivet steel, rivets, *see* 603.21, 608.4; steel castings, *see* 611.41; steel bridges, *see* 605.21.

605.12 Structural Steel for Buildings

American Institute of Steel Construction. Applications of Structural Steels and Light-Weight Alloys for Bridges, Buildings, and Similar Structures, 1943. Gives requirements for physical and mechanical properties, fabrication and usability characteristics, forming and bending, riveting, welding, corrosion, aluminum, magnesium, stainless steel, low-alloy structural steel, sheet steel for structural purposes, standard structural carbon steel, and general conclusion.

American Institute of Steel Construction. Design of Rigid Frame Knees, 1943. Covers stresses in rigid frame knees, elastic stability of rectangular plates, rigid frame knee having straight flanges, and rigid frame knee having a curved inner flange. Gives mathematical calculations and diagrams.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Pile Foundations. Covers the investigation, design, and construction of pile foundations. Gives requirements for steel piles—H-sections and steel pipes filled with concrete.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1938. Structural Silicon Steel. Gives process, discard, chemical composition, ladle analyses, check analyses, physical properties, modification in ductility, yield point, bend tests, test specimens, number of tests, retests, permissible variation in weight and thickness, finish, identification marks, inspection, and rejection. Identical with the requirements for the same material in A.S.T.M. No. A94.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Welded Structural Steel. Includes the furnishing, fabrication, erection, inspection, and in some instances the design of structural steel. Gives general requirements, material, loads and forces, unit stresses, design, fabrication, inspection, weighing and shipping, and erection.

American Society of Mechanical Engineers. Boiler Construction Code, 1940. Specifications for Steel Bars (S-7). Based on American Society for Testing Materials Specification A7.

American Society for Testing Materials, A 7-42; 1942. American Association of State Highway Officials, M 94. American Standards Assn. G24-1942. Steel for Bridges and Buildings. Covers carbon-steel of structural quality for use in the construction of bridges and buildings and for general structural purposes. Requirements as to castings, rivet steel, forgings, structural bolts, and rolled base plates; chemical composition, tensile and bending properties, preparing of test specimen, permissible variations in weight and thickness, finish, and inspection.

American Society for Testing Materials, A 94-39; 1939. American Assn. of State Highway Officials, M 95-39. American Standards Assn. G41.1-1942. Structural Silicon Steel. Covers special high-strength structural steel for use as main stress-carrying structural members. Gives requirements for chemical composition, ladle analysis, tensile properties, elongation, bending, test specimen, permissible variations in weight and thickness, finish, and inspection.

American Society for Testing Materials, A 242-42; 1942. Low-Alloy Structural Steel. Covers open-hearth or electric-furnace low-alloy structural steel suitable for welding or riveting, intended primarily for use as main stress-carrying material of structural members. Material not under 3/16 and not over 2 in. in thickness. Chemical composition, ladle and check analyses, tensile and bending properties, test specimens, number of tests, permissible variations in weight and thickness, marking, inspection, rejection, and rehearing.

American Society for Testing Materials, A 245-44T; 1944. Tentative Specifications for Light Gage Structural Quality Flat Hot-Rolled Carbon Steel 0.2499 to 0.0478 In. in Thickness. Intended for structural purposes where physical test values are required. Gives basis of purchase, process, chemical composition, ladle and check analyses, tensile and bending properties, test specimens, number of tests, permissible variations in weight and dimensions, marking, finish, inspection, and rejection.

American Society for Testing Materials, A 246-44T; 1944. Tentative Specifications for Light Gage Structural Quality Flat Rolled Carbon Steel, 0.0477 to 0.0225 In. in Thickness. Intended for structural purposes where physical test values are required. Gives basis of purchase, process, chemical composition, ladle and check analyses, tensile and bending properties, test specimens, number of tests, permissible variations in weight and dimensions, marking, finish, inspection, and rejection.

American Standards Assn., A 57.1-1943. Sponsored by American Institute of Steel Construction and American Society of Civil Engineers. Steel Construction; Riveted, Bolted, or Welded Construction. Intended to govern the design, fabrication and erection of structural steel for buildings and other structures covered by building code requirements. Gives general requirements and covers materials, allowable stresses, loads, horizontal forces, slenderness ratio, unsupported compression flanges, effective span length, minimum thickness of material, gross and net sections, connections, welds, spacing of welds, rivets and bolts, rivet and bolt spacing, plate girders and rolled beams, composite beams, separators, tie plates, lacing, camber, column bases, anchor bolts, workmanship, shop painting, erection, and symbols.

Steel Joist Institute. Steel Joist Construction, 1936. Standard Specification for Steel Joist, 1941. Gives requirements for scope, definition of steel joist, materials, connections, methods of design and stresses, span, spacing, erection. bridging, uses of steel joist construction, decks and top slabs, deflection, factor of safety, and wood and steel roof decks.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R94-30; 1930. Open Web Steel Joists. This recommendation establishes a standard symbol system, standard resisting moments, end reactions, and allowable uniform loading for various spans and for beam depth of 8 to 16 in. Initiated by the Steel Joist Institute.

U. S. Gov., Federal Specification QQ-S-741; 1942. Amendment 2; 1944. Steel, Structural (Including Welding) and Rivet; for Bridges and Buildings. Covers type I, for riveted structures; type II, for welded structures; grade A, bridge steel; grade B, building steel; class 1, noncopper steel; and class 2, copper-bearing steel. Gives material, workmanship, general requirements, manufacture, chemical composition, manufacturer's analyses, tensile properties, modification in elongation, and bending; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Navy Dept. Specification 48S8c; 1934. Steelwork, Structural, Fabricated (Shore Use).

References.—Metal roofing material, *see* also 604.3; steel buildings, *see* 605.22; for other references, *see* references under 605.11.

605.13 Structural Steel for Cars and Locomotives

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Welded Structural Steel. Includes the furnishing, fabrication, erection, inspection, and in some instances the design of structural steel. Gives general requirements, material, loads and forces, unit stresses, design, fabrication, inspection, weighing and shipping, and erection.

American Society for Testing Materials, A 113-42; 1942. American Standards Assn., G39.1-1942. Structural Steel for Locomotives and Cars. Covers structural steel shapes, plates (except boiler and firebox plates), and bars intended for use in locomotive and car construction. Requirements as to chemical composition, ladle analysis, tensile properties, elongation, bending, preparation of test specimen, permissible variations in weight and dimensions, finish, and inspection.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Center Plates for Freight Cars of 40 and 50 Tons Nominal Capacity. Dimensional drawing of truck bolster center plate, and body bolster center plate.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Center Plates for Freight Cars of 70 Tons Nominal Capacity and Over. Dimensional Drawing of truck bolster center plate and body bolster center plate.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Sill, Center, Steel, Section for. For use with cars having center sills of A.A.R. "Z" section. Dimensional drawing and weight per foot for 25 3/4-inch center plate height railway cars.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Sill, Center, Steel, Section for. Dimensional drawing for 26 3/4-inch center plate height railway cars.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Sills, Steel, Splicing of. Detailed procedure for the joining of sills by riveting or welding, with fifteen detail drawings for various types.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1943. Emergency Specification E-M-116-43. Modifies A.A.R. Specification M-116-42, Steel, Structural, Shapes, Plates, and Bars, by changing check analysis for chemical composition.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Steel, Structural, Shapes, Plates and Bars. Specifications M-116-42; 1942. For use in cars and locomotive structure (not boiler or firebox). Gives manufacture, chemical and physical properties and tests, permissible variations of weights and dimensions, finish, marking, and inspection and rejection.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Truck Bolsters, M-202-38; 1938. Requirements for freight equipment, integral or separable plate, material by A.A.R. specifications, four sizes of journal, deflections under test loads, and loading diagrams.

U. S. Gov., Federal Specification QQ-S-731; 1933. Amendment 1; 1934. Steel; Structural, for Cars. Covers six classes—(A) structural steel, noncopper; (B) structural steel, copper; (C) steel for cold noncopper; (D) steel for cold pressing, copper; (E) rivet steel, noncopper; and (F) rivet steel, copper; made by the open-hearth process. Gives requirements for chemical composition, tensile properties, and permissible variations; methods of sampling, inspection, and tests; and requirements for packing and marking.

References.—Alloy structural steel for cars, *see* 621.31, 621.32, 621.33; methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; zinc and other coatings, *see* 600.3. Tolerances on weight and thickness of plates and bars, *see* 600.7; standard thicknesses of plates, *see* 604.0; standard sheet sizes, *see* 604.10, 604.20; rivet steel, rivets, *see* 603.21, 608.4; boiler and firebox steel, *see* 604.11; other cast steel railway materials, *see* 611.4; locomotives and cars, *see* 701.3, 726.

605.14 Structural Steel for Machinery

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Shearing Values of Structural, Rivet and Mild Steel. Recommended Practice. Requires that shear in a plane perpendicular to direction of rolling shall not exceed 80 percent of allowable stress for tension.

References.—Alloy structural steel, *see* 621.31, 621.32, 621.33; methods of testing, general requirements for metals, *see* 600.1; standard thicknesses of plates, *see* 604.0; boiler and firebox steel, *see* 604.11; steel castings for machinery and boilers, *see* 611.41.

605.15 Structural Iron and Steel for Ships

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Structural Steel for Hulls. Include rules for inspection and testing, process of manufacture, marking, details of tests, steel rivets, iron plates and shapes, round and flat iron bars, and iron rivets.

American Society for Testing Materials, A 131-39; 1939. Structural Steel for Ships. Covers structural steel shapes, plates, and bars. Gives requirements for chemical composition, ladle analysis, tensile properties, elongation, bending, preparation of test specimen, permissible variations in weight and dimensions, finish, and inspection.

U. S. Gov., Federal Specification QQ-S-751a; 1938. Amendment 1; 1938. Steel; Structural (Including Steel for Cold-Flanging) and Steel, Rivet; for Ships Other Than Naval Vessels. Covers four grades—(A) structural steel, welding quality; (B) structural steel, not welding quality; (C) steel for cold flanging; and (D) rivet steel; made by the open-hearth or electric-furnace process. Gives requirements for chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 44T1c; 1936. Steel, Tubing, Structural.

U. S. Gov., Navy Dept. Specification 46S11; 1936. Steel; Shapes and Bars for Hull Construction, Including Material for Drop and Miscellaneous Forgings.

U. S. Gov., Navy Dept. Specification 47S20a; 1937. Steel, Corrosion-Resisting: Plates, Sheets, Strips, and Structural Shapes.

U. S. Gov., Navy Dept. Specification 48S5e; 1934. Steel; Plate, Hull, Structural, Black (Uncoated) and Zinc-Coated (Galvanized).

References.—Alloy structural steel, *see* 621.31, 621.32, 621.33; plates for ship hulls. *see* 604.13; methods of testing, general requirements for metals, 600.1; zinc and other coatings and tests, *see* 600.3;

tolerances on weights and thickness of plates and bars, *see* 600.7; standard thicknesses of sheets and plates, *see* 604.0; rivet steel, rivets, *see* 603.21, 608.4; steel castings for ships, *see* 611.41; boats, ships, *see* 725.3, 725.4.

605.19 Miscellaneous Structural Steel

American Society for Testing Materials, A 78-43; 1943. American Standards Assn., G40.1-1943. Low Tensile Strength Carbon-Steel Plates of Structural Quality for Welding. For two grades of structural steel suitable for welding, including modifications for forge welding. Covers chemical composition, ladle analysis, tensile and bending properties, elongation, test specimen, permissible variations in weight and thickness, finish, and inspection.

American Society for Testing Materials, A 123-33; 1933. American Assn. of State Highway Officials, M 111-35. American Standards Assn., G8.1-1933. Zinc, Hot-Galvanized, Coatings on Structural Steel Shapes, Plates, and Bars, and Their Products. For dipping articles in molten bath of zinc, minimum impurities in zinc, test samples, embrittlement of material, weight of coating, adherence and uniformity of coating.

U. S. Gov., Army Air Forces Specification 40643-A-1; 1944. Beam, Dual Wheel Jacking, 30 Ton.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks. FP-41. Structural Steel.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-114C; 1942. Steel; Structural, for Ordnance Material.

U. S. Gov., U. S. Army, Ordnance Department. Specification 57-114-1A; 1942. Steel; Plain Carbon and Low-Alloy High Tensile, Plate, Shape, Sheet, Strip and Rectangular Bars, for Welded Structures.

U. S. Gov., U. S. Army, Ordnance Department. Specification 89-3330; 1940. Cathead; Submarine Mine.

References.—Alloy structural steel, *see* 621.31, 621.32, 621.33; methods of testing, general requirements for metals, *see* 600.1; zinc coatings, *see* 600.3; tolerances on weights and thicknesses of plates and bars, *see* 600.7; standard thicknesses of sheets and plates, *see* 604.0; rivet steel, rivets, *see* 603.21, 608.4; other steel track materials, *see* 606.

605.2 STRUCTURAL SHAPES AND PLATES, FABRICATED

605.20 General Items

American Institute of Steel Construction. Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, 1941. Covers scope, plans and drawings, material, loads and forces, reversal of stresses, combined stresses, members carrying wind only, composite beams, effective span length, allowable unit stresses, slenderness ratio, depth ratio, unsupported compression flanges, minimum thickness of material, gross and net sections, expansion, connections, rivets and bolts, rivet spacing, plate girders and rolled beams, separators, tie plates, lacing, camber, column bases, anchor bolts, workmanship, shop painting, erection, and inspection.

American Institute of Steel Construction. Specification for the Design, Fabrication and Erection of Structural Steel for Buildings by Arc and Gas Welding (Tentative), 1942. For rigid frame, conventional (simple), and semi-rigid framing. Covers requirements for plans and drawings, materials, design loads and stresses, design, erection, and inspection; and includes recommended tentative standard details and selected excerpts from American Welding Society Code for Arc and Gas Welding in Building Construction.

American Institute of Steel Construction. Code of Standard Practice for Steel Structures Other Than Bridges, 1941. Covers general requirements, classification, invoicing, drawings and specifications, stock material, inspection and delivery, erection, delays in prosecution of work, extra work, proposals and contracts, and standard documents.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1939. Instructions for the Inspection of Bridge Erection. Gives a set of general instructions, and covers details of traffic, materials, records and reports, progress and general conduct of work, details of erection, movable bridges, welded work, and cleaning up site.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1939. Instructions for the Inspection of the Fabrication of Steel Bridges. Gives a set of general instructions and covers details of fabrication, machine shop work, shipments, and reports.

605.21 Steel Bridges and Railway Turntables

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes general provisions—definition of terms, proposal requirements and conditions, award and execution of contract, scope of work, control of work and materials, legal relations and responsibility to public, prosecution and progress, and measurement and pavement; specifications for construction, excavation and fill, sheet piles, bearing piles, concrete masonry, reinforcement, ashlar masonry, mortar rubble masonry, dry rubble masonry, brick masonry, steel structures, bronze or copper-alloy bearing and expansion plates, steel grid flooring, railings, painting metal structures, riprap, concrete cribbing, waterproofing, dampproofing, name plates, timber structure, preservative treatments for timber, timber cribbing, sectional plate pipe and arches, and wearing surfaces; recommendations for design—general features of design, loads, distribution of loads, unit stresses, pile loads and bearing power of soils, substructure and retaining walls, structural steel design, concrete design, design of timber structures, sectional plate pipe and arches, and rating of existing bridges; specifications and references to other specifications for cement, water for use with cement, aggregates, reinforcement, structural, eyebar and rivet steels, wrought iron, steel forgings and castings, gray-iron and malleable castings, bronze or copper-alloy bearing and expansion plates, sheet piles, steel sheet piling, steel grid floors, paint, welding, sheet metal for water stops and general use, sectional plate pipe and arches, stone for masonry, brick, bituminous materials and joint fillers, asphalt paving blocks, premolded asphalt plank, structural timber, lumber and piling, and timber preservatives; tables of moments, shears and reactions; formulas for compressive members; and truck train and equipment loadings.

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges. Includes specifications for steel structures—bronze or copper-alloy bearing and expansion plates, steel grid flooring, and railings—requirements for materials (to conform to American Society for Testing Materials specifications); steel structures, also including quality of workmanship, straightening material, finish, rivet holes, punched and reamed or drilled holes, shop assembly, drifting of holes, match-marking, rivets, bolts and bolted connections, riveting, edge planing, flame cutting, facing of bearing surfaces, abutting joints, end connection angles, lacing bars, finished members, web plates, fit of stiffeners, eyebars, annealing, pins and rollers, boring pin holes, pin clearances, welds, screw threads, pilot and driving nuts, notice of beginning of work, facilities for inspection, inspector's authority, mill orders, weighing of members; marking and shipping, erection of structure, plans, plant, delivery of materials, handling and storing materials, falsework, methods and equipment, bearings and anchorage, straightening bent material, assembling steel, riveting, bolted and pin connections, misfits, removal of old structure and falsework, basis of payment, payment for test eyebars, pay weight, variance in weight, computed weight; bronze or copper-alloy bearing and expansion plates, also including bronze plates, copper-alloy plates, placing, and measurement and payment; steel grid flooring, also including type, arrangement of sections, provision for camber, field assembly, connection to supports, welding, repairing damaged galvanized coatings, concrete filler, painting, and method of measurement and basis of payment; and railings, also including general definition, line and grade, construction, and painting.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Movable Railway Bridges. Covers chemical requirements for tool steel.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for the Design of Rigid Frame Steel Bridges. Gives requirements for definition, articulation at footings, foundations; spacing, deflections, distribution of live load, impact, loads and forces, combined stresses, unit stresses, bracing, stiffeners at points of bearing, and connections.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Movable Railway Bridges. Includes specific and detail rules for the design and manufacture of movable railway bridges. Covers proposals and general requirements, general features of design, loads, unit stresses, proportioning of parts, details of design, wire ropes and attachments, power equipment, materials, workmanship, and erection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Steel Railway Bridges (for Fixed Spans Not Exceeding 400 Feet in Length). Includes specific and detailed rules for the design and manufacture of bridges. Gives requirements for proposals and drawings, general features of design, loads and stresses, unit stresses, details of design, workmanship, eyebars, weight and shipping. Emergency provisions adopted Sept. 15, 1942, and in effect April 1943 changed stresses to conserve steel during the present emergency for temporary structures.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Steel Railway Turntables. Gives information to be given bidders, other specifications, general features of design, loads, unit stresses and proportioning of parts, details of design, center, end trucks, and pit and tracks.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Welded Structural Steel. Includes the furnishing, fabrication, erection, inspection, and in some instances the design of structural steel. Gives general requirements, material, loads and forces, unit stresses, design, fabrication, inspection, weighing and shipping, and erection.

American Society for Testing Materials, A 207-39; 1939. American Assn. of State Highway Officials, M 100-39. Rolled Wrought-Iron Shapes and Bars. Gives requirements as to chemical composition, tensile and bending properties, test specimen, permissible variations in size and weight, finish, and inspection.

American Welding Society. Specifications for Welded Highway and Railway Bridges—Design, Construction, and Repair, 1941. The application of metal arc and gas welding to the fabrication, field assembling and repair of highway and railway bridges. Covers general provisions, design of new bridges, strengthening and repairing of existing bridges, filler metal, equipment and processes, workmanship and technique, inspection, qualification, unit stresses for welded design, definitions, welding symbols, and qualification of welding procedures and operators.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Structural Steel.

References.—Rules for inspection and maintenance of bridges, *see* 605.20; methods of testing; general requirements for metals, *see* 600.1; structural steel for bridges, *see* 605.11, 621.31, 621.32, 621.33; rivet steel, rivets, *see* 603.21, 608.4.

605.22 Steel Buildings and Metal Parts of Buildings

American Institute of Steel Construction. Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, 1937. Requirements for steel to meet A.S.T.M. specifications, loads and stresses, for wind only composite beams, span length, allowable unit stresses, sections and connections, rivet spacing, plate girders and rolled beams, tolerances, painting, bolting up, and inspection.

American Institute of Steel Construction. Specification for Fireproofing Structural Steel Buildings, 1934. Requirements for insulation to protect steel from fire hazards; classification of intensity and duration of fires and test procedure in accordance with A. S. T. M. Specification C 19, steel variation for temperature based on fire hazard, fireproofing materials, and alternate method of test.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Includes metal doors and fire doors, metal clad doors and fire doors, and metal frames for doors and windows.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Metal Screens. Gives requirements for metal work, hardware, number tags, and types.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for working stresses (tension, compression, shearing, bearing) of the cast, rolled, drawn, or extruded metals used.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Sheet Metal Work. Gives requirements for materials (copper, galvanized iron, lead, solder), workmanship, flashings, gutters, eaves strips, gravel stops, leaders or conductors, conductor heads, ridge rolls, hip capping, ventilators, and skylights.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Welded Structural Steel. Includes the furnishing, fabrication, erection, inspection, and in some instances the design of structural steel. Gives general requirements, material, loads and forces, unit stresses, design, fabrication, inspection, weighing and shipping, and erection.

American Society of Mechanical Engineers. American Standards Assn., B32.1-1941. Preferred Thicknesses for Uncoated Thin Flat Metals (Under 0.250 In.). Provides a simplified system for designating the thickness of uncoated, thin flat metals and alloys by decimal parts of an inch. Gives table of preferred thicknesses.

American Welding Society. Tentative Code for Arc and Gas Welding in Building Construction; 1941. Includes general provisions, design of welded connections, filler metal, workmanship, inspection, qualification, definitions, welding symbols, prequalified welded joints, qualifications of welding procedures and operators, illustrations of acceptable and defective weld profiles, and record of operator qualification tests.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention No. 7.60; 1938. Metal Stacks. Safeguards against windstorm damage. Gives recommendations for construction of new stacks and for anchorage of self-supporting and guyed stacks.

Associated Factory Mutual Fire Insurance Companies. Pamphlets 32; 1936. Fire Doors, Common Types and Methods of Installation. Gives general requirements, selection of fire doors, installation and maintenance, common types of fire doors, special types of fire doors, and fire shutters.

National Safety Council (American Society of Safety Engineers, Engineering Section). American Standards Assn., A14-1935. Safety Code for Construction, Care and Use of Ladders. Definitions of terms; specifications and construction of fixed, single, extension, fire, step, trolley and side-rolling, sectional trestle and extension trestle ladders; installation of fixed ladders; accessories; care and use.

Open Steel Flooring Institute, Inc. Specifications for Grating. Covers steel gratings of open construction having riveted, welded, or interlocked joints, either of rectangular or reticulated design having parallel bearing bars and either straight or diagonal cross members. Includes requirements for workmanship, thickness and spacings of bars, fasteners, treads, cutting and bending, erection symbols, labeling and finish (Hot Dip Galvanizers Assn. Specification CS-10-36).

Safe Manufacturers' National Assn. Specification for File Storage Room Doors, F4; 1939. For fire-resistant doors, but not for the protection of valuable records; 3 types based on degree of resistance, methods for fire resistance, and hose stream tests.

Underwriters' Laboratories, Inc. Standard for Fire Resistance Classification of Vault and File Storage Room Doors, 1941. General, classification, design and construction, fire endurance test, fire and fire hose stream test, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Tin-Clad Fire Doors and Shutters, 1941. For tin-clad fire doors and shutters entitled to classification as being in compliance with Standards of Underwriters' Laboratories, Inc. for one or more of the situations defined in the Standards of the National Board of Fire Underwriters for the Protection of Openings in Walls and Partitions Against Fire. Materials, construction, conduct of factory inspection work and methods and procedures for tests, and standard method for the determination of weight and composition of coating on terne plate for tin-clad doors and shutters.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R29-42; 1942. Eaves Trough, Conductor Pipe, and Fittings, and Ridge Rolls. This recommendation establishes a simplified schedule of sizes and weights of eaves trough, conductor pipe, fittings, and styles of gutters and ridge rolls. Sponsored by the National Assn. of Sheet Metal Distributors and the National Wholesale Hardware Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R72-27; 1927. Solid Section Steel Windows. This recommendation establishes a simplified schedule of nomenclature, sizes, styles, and division of solid section steel windows. Sponsored by the manufacturers now represented by the Metal Window Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R82-28; 1928. Hollow Metal Single-Acting Swing Doors, Frames, and Trim. This recommendation establishes a list of standard stock sizes of hollow metal doors, including door clearances, door dimensions, details of butt mortise, lock mortise, and strike mortise, dimensions of transom, rough buck, cabinet jamb, casing, and combination frame, types of combination frame.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R83-28; 1928. Kalamein Single-Acting Swing Doors, Frames, and Trim. This recommendation establishes a list of standard stock sizes and dimensions for kalamein doors, including types of doors, door clearances, door dimensions, jamb details, gage of metal and butt mortise details.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H19; 1934. Manual of Fire-Loss Prevention of the Federal Fire Council. It is aimed to present herein the essentials relating to design, materials of construction, and equipment and operation of buildings that effectively prevent or abate loss by fire. An initial discussion is given of justifiable outlay for fire-loss prevention, considering the values and the degree of hazard present. Sections III to VI, inclusive, deal with the fire resistance of building materials, assemblies, and types, control of spread of fire by structural means and design and arrangement of buildings to secure exit facilities for occupants in case of fire. In sections VII and VIII, structural and equipment features having a bearing on safeguarding hazards incidental to heating, lighting, and power supply are discussed, as also those pertaining to lightning protection, fire hazards during construction, and special occupancy hazards. In section IX, protection of records is treated from the standpoint of construction and equipment and in section XIII from the standpoint of business routine and general fire prevention. Sections X and XI deal with equipment for detecting and extinguishing fire. In section XII, general methods for decreasing the ease of origin and initial spread of fire are outlined, and in sections XIV to XVI, inclusive, the effective use of equipment in case of fire by prior training for emergency, and the systematic inspection of property to enable unnecessary fire hazards to be promptly eliminated and defects in construction and equipment remedied. Two general subdivisions of the manual may be noted, namely, construction and equipment up to and including section XI, and fire prevention and maintenance covered in the subsequent sections.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS49; 1940. Metallic Roofing for Low-Cost House Construction. The general aspects and status of metals utilized for roofing purposes are discussed. Considerations which apply in general to all roofing materials and to metals in particular are given. Basic principles of metal-roof construction are listed, together with descriptions of the type of seams, decks, nails, and coverings used. Galvanized sheet steel, terne, and copper roofings are discussed in detail because they constitute the bulk of present-day roofs. The durability of galvanized sheet-steel roofings is shown by the data obtained from outdoor-exposure tests conducted by the American Society for Testing Materials. Information on the maintenance of terne and galvanized roofs is given.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS75; 1941. Survey of Roofing Materials in the North Central States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the North Central States is described, with numerous references to similar surveys made previously in the Southeastern and Northeastern States. Detailed studies of roofing materials in Pittsburgh, Pa.; Cincinnati and Toledo, Ohio; Grand Rapids and Lansing, Mich.; Chicago, Ill.; Milwaukee, Wis.; St. Paul, Minn.; Bismarck, N. Dak.; Sioux Falls, S. Dak.; Omaha, Nebr.; Kansas City, Moberly, and St. Louis, Mo.; and Indianapolis, Ind., are reported. A tabulation, by states, of the kinds of roofing materials used in more than 8,000 rural and small-town dwellings, along approximately 3,000 mi. of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 29,000 rural and small-town dwellings along 7,000 mi. of highway in the 32 states covered by the three surveys. Forty-eight photographs, illustrating type of weathering of roofing materials, and features of design and construction of roofs, are shown.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks 1941; FP-41. Includes structural steel.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 7Yg; 1934. Roofing, Siding, and Sheet Metal Work; Dampproofing and Membrane Waterproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 10Yc; 1938. Metal Windows.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 15Yb; 1934. Standard Methods for Inspection of Materials for Roofing, Siding, Sheet Metal Work, Dampproofing, and Waterproofing.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification No. 17Yb; 1938. Metal Weatherstripping for Wood Doors, Windows, and Transoms.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 32Ya; 1935. Metal Doors.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Galvanized, Corrugated Iron or Steel Roofing and Ridge Roll, 1941.

U. S. Gov., Treasury Dept., Procurement Div. 285A; 1939. Steel, Plate, Floor, Rolled. Plates shall be of the raised-figure type, and of one grade, 2 classes—(A) light patterns, and (B) regular patterns, made either of Bessemer or open-hearth steel. Gives requirements for material area covered by raised figures, widths, lengths, thickness at base of raised figure; height of raised figure, weight per square foot, and drawings of various patterns; methods of sampling, inspection, and tests; and packaging and marking.

References.—Structural steel for buildings, *see* 605.12, 621.31, 621.32, 621.33; sheet metal roofing, *see* 604.3; sheet metal eves troughs, *see* 607.5; rivet steel, rivets, *see* 603.21, 608.4; masonry and frame buildings, parts of buildings, fire tests of materials, *see* 518.50, 518.51.

605.23 Steel Tanks, Towers, and Flumes

American Petroleum Institute, Div. of Production. Standard 12-A; 1941. Specification for Standard Tanks With Riveted Shells for Oil Storage. Provides major design details for 8-ring tanks with 100-in. plates, sizes 36 to 168 ft. in diameter; for 9th and 10th courses of tanks with 72-in. plate, sizes 36 to 144 ft. in diameter; and for all courses (1st to 10th inclusive) 72-in. plates, 168-ft. diameter tanks. These design details are based on drilled holes and hot driven rivets, except where alternate lap joints are shown for hot and cold driven rivets. Slight improvments in design methods, materials, shell design, roof design, bottom design, and tables giving capacities of tanks using 72-in. and 100-in. courses.

American Petroleum Institute, Div. of Production. Standard 12-B; 1944. Specification of Standard Bolted Tanks. Provides the industry with a standard series of bolted steel tanks, comprising an adequate range and variety of sizes to meet oil field requirements, built in accordance with modern manufacturing practice so that decks, bottoms and individual staves as supplied by any manufacturer will be readily interchangeable with those supplied by any other. Covers scope, material, fabrication and erection, cleanouts for production tanks, walkways and stairways, piping flanges and relief valves, marking, inspection and rejection, and appendices.

American Petroleum Institute, Div. of Production. Standard 12-C, 1944. Specification on All-Welded Oil Storage Tanks. This specification covers all-welded steel tanks for oil storage, including allowable plate joint stresses, qualification procedures for welding, and chemical and physical properties of material, including welding rods. Covers design, fabrication, erection, standard appurtenances, testing joints by sectioning methods, qualification procedure, marking, and appendices.

American Petroleum Institute, Div. of Production. Standard 12-D; 1944. Specification for All-Welded Production Tanks, Tentative. This specification covers sizes, materials, plate thicknesses, and design factors for light-weight all-welded steel production tanks. Covers material, design, cleanouts, walkways and stairways, bolting patterns for thief hatches and relief valves, threaded connections, marking, and adjustments.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Riveted Steel Water and Oil Tanks. Gives requirements for material, loading, unit stresses, cylindrical rings, workmanship, caulking, minimum thickness of plate, joints, rivets, rivet holes, punching, pitch, tank support, and painting.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Steel Substructures for Wood Water Tank (50,000 and 100,000-gal. capacity). Structure will consist of 12-post steel tower, complete in all details. Gives requirements for material, workmanship, and painting.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Welded Steel Tanks for Railway Water Service. Apply to the construction of fusion arc welded steel water storage tanks. Covers general requirements, materials, design, welding, testing, painting and inspection, and accessories and fittings.

American Society of Mechanical Engineers. Boiler Construction Code. API-ASME Code for Unfired Pressure Vessels, 1943. Applies to unfired pressure vessels constructed of carbon steel for petroleum liquids and/or gases within the limits prescribed in the Code. Gives rules covering the design and construction of vessels subjected to external pressure, fusion-welded, riveted, and integrally forged vessels, periodic inspection, and repair. Also gives a list of approved materials, suggestions regarding internal structures, corrosion allowances, and protective linings.

American Society of Mechanical Engineers. Boiler Construction Code. Unfired Pressure Vessel Code, 1943. Pressure containers for which construction rules are established include vessels subjected to external pressure, and those for gases and liquids at temperatures of -20°F and below. Requirements cover materials, riveted joints, dished and flat heads, working pressures, welding, nozzle openings, brazing, braced and stayed surfaces, hydrostatic tests.

American Water Works Assn. Tentative Standard Specifications for Elevated Steel Water Tanks, Standpipes and Reservoirs, 7H.1-1943. Covers requirements for materials, design, accessories, welding, shop fabrication, erection, inspection, testing, and field painting.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume I. Structural Details, 1938. For steel tanks for fire protection, standard sizes; plates, shapes and rivets according to A.S.T.M. specifications, dead, live, and wind load computations, allowable stresses, thicknesses of plates, and design details.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume I. Structural Details, 1938. For steel towers for supporting water tanks, minimum number of columns, materials according to A.S.T.M. specifications, computation of dead, live, and wind load, allowable unit stresses, design details.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume II; 1940. Piping, Fittings, and Heating Systems. For water tanks, requirements for discharge pipe and fittings, expansion joint, filling, overflow, clean-out and drain, mill-use connections, water level indicator, valve pit or house, frostproof casings for pipes. Specifications for tank heating equipments, including method of determining necessary heater capacities.

National Board of Fire Underwriters. Gravity and Pressure Tanks, No. 22; 1941. Standards for gravity tanks which are usually built of wood or steel and are often supported on towers, ordinarily of steel although reinforced concrete towers are sometimes used. Covers general information and recommendations, steel gravity water tanks, steel towers, wooden water tanks, foundations, approval, pipe connections and fittings, valve enclosures and frost protection, tank heating equipment, pressure tanks, figures, and tables.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Gravity and Pressure Tanks. Standards for the construction and installation of gravity and pressure tanks. Covers information and recommendations, steel gravity water tanks, steel towers, wooden water tanks, foundations, approval, pipe connections and fittings, valve enclosures and frost protection, tank heating equipments, and pressure tanks.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Freeing Tanks of Flammable Vapors. Standards for freeing oil tanks, bunkers, and compartments of dangerous concentration of flammable explosive or toxic gases previous to entering for any purpose of making repairs on oil burning or oil tank vessels.

Underwriters' Laboratories, Inc. Standard for Design and Construction of Horizontal and Vertical Above-Ground Storage Tanks for Hazardous Liquids, 1922. Requirements for steel tanks not under pressure, design and diagrams for riveted and welded seams, piping, manholes, etc., for horizontal and vertical tanks.

Underwriters' Laboratories. Standard for Underground Storage Tanks, 1937. For the Storage of inflammable liquids, not under pressure, in accordance with the regulations of the National Board of Fire Underwriters. Sizes of vertical and horizontal tanks based on capacity and thickness of metal, to be open-hearth steel or wrought iron, describes riveted and welded joints, pipe connections, manholes, safety relief, asphalt painting, marking, and detail diagrams.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-11a; 1943. Tower; Aerial Navigation Beacon.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Tower, Crow's Nest.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Tower, Temporary, Steel.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 346. Tanks; Steel, Airplane Delivery.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 347. Tank; Water, Steel, Demountable.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 363. Tower, Hose Drying.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-57. Tower, High Counterpoise for UHF Radio Range.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-58. Tower, Low Counterpoise for UHF Radio Range.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-61. Counterpoise and Supports for UHF Fan Marker.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-97. Tower, Counterpoise, UHF, Erection of.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-98. Adcock Tower and Counterpoise.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-104. Masts; Steel, Galvanized Latticed.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-156. Alaska-Type Steel Tower Antenna System; Erection and Construction.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-167. Antenna Poles and Fittings; Installation of Receiving.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-186. Antenna Tower; Heavy-Duty, Self-Supporting, Insulated.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-221. Tanks, 515-Gal., Inspection of.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-239. Counterpoise and Tower; UHF Range, Erection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-252. Beacon, Airways, Steel Tower Skeleton Form 7A.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-252. Beacon, Towers, Form 7A, Steel, Skeleton.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-256. Mast; Steel, Galvanized Latticed, Guyed, Triangular.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-404. Counterpoise and 30' Tower for UHF Range Stations.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-514. Antenna Towers, Self-Supporting.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-517. Counterpoise for L. P. Fan Marker Bldg. and Incidental Construction.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H32; 1941. American Standards Assn., C2.2-1941. Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines. Comprising part 2 of the fifth edition, National Electrical Safety Code. Includes strength requirements for steel tower construction.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications No. 11. Lookout Towers; Steel.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 8Yd; 1934. Tanks; Steel and Wood.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 45-1; 1943. Tower; Searchlight, Demountable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-479; 1930. Tower; Radio, Self-Supporting.

References.—Structural steel for bridges and buildings, *see* 605.11, 605.12; alloy structural steel, *see* 621.31, 621.32, 621.33; plates for tanks, *see* 604.1; zinc coatings and tests, *see* 600.3; other tanks, *see* 956.2; range boilers, expansion tanks, fuel tanks, *see* 614.1, 614.3; railway tank cars, *see* 726.1.

605.24 Metal Lath

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for for Railroad Purposes: Lathing and Plastering. Gives requirements for metal lath and metal lathing.

Contracting Plasterers' International Assn. Standard Specification. Includes requirements for metal lath.

Metal Lath Manufacturers Assn. Metal Lath Specifications, 1936. Covers quality of materials and method of application, nomenclature, weights per square yard for flat expanded, flat rib, 3/8-in. rib, and sheet lath; tables for support spacings on ceiling and on walls, size, weights, and spacing of attaching devices; requirements for plastered metal stud partitions and wall furring, suspended ceiling and soffit construction, corner and joint reinforcement; plastering and stucco work, with diagrams of construction details.

Metal Lath Manufacturers Assn. Standard Metal Lath Specifications for Better Plastering and Concrete Stucco. Includes nomenclature for metal lath construction; requirements for material; size, weight, and spacing of attaching devices; minimum requirements for plastered metal stud partitions and standing on wall furring; minimum requirements for furred contact or suspended ceiling construction for the soffits of steel beams, purlins or joists, or concrete or hollow tile floor arches or roofs; corner and joint reinforcement; erection of metal lath; and appendix of general notes on plastering and stucco, solid and soundproof partition details, and plaster beams and cornices.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R3-44; 1944. Metal Lath (Expanded and Sheet) and Metal Plastering Accessories. This recommendation simplifies the types, weight, and sizes of expanded and sheet metal lath and accessories including bull-nose corner bead, corner lath, strip lath, base screeds, metal casings, concealed picture mould, tie wire, hanger wire, and metal studs for hollow partitions. Sponsored by the Metal Lath Manufacturers Association.

U. S. Gov., Federal Specification QQ-B-101c; 1938. Bases, Metal; for Plaster and Stucco Construction. Permits either expanded metal, perforated sheet metal, woven or welded wire, or combinations of these. Covers eight types—(F) flat, (SF) self-furring, (FR) flat rib, (F 3/8 R) 3/8-in. rib, (F 3/4 R) 3/4-in. rib, (FB) flat rib with backing, (SFB) self-furring with backing, and (SRB) stiffened or ribbed with backing. Gives requirements for finish, material, workmanship, thicknesses of metal in sheets, width of strands, attachment of strands and stiffening rods or ribs, mechanical band for plaster or stucco, sizes of openings, weights, and backing; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Standard thicknesses of sheets, *see* 604.0; tolerances on weights and thickness of sheets, *see* 600.7; building construction, *see* 518.50, 518.51; wire sizes, *see* 603.40.

605.25 Steel for Concrete Reinforcement

American Assn. of State Highway Officials, M31-42. Standard Specifications for Billet-Steel Bars for Concrete Reinforcement. Gives scope, basis of purchase, process, cold-twisted bars, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, test specimens, number of tests, permissible variations in weight, finish, marking, inspection, rejection, rehearing, and methods of test.

American Assn. of State Highway Officials, M42-42. Standard Specifications for Rail-Steel Bars for Concrete Reinforcement. Gives scope, manufacture, hot-twisted bars, tensile properties, bending properties, test specimens, number of tests, permissible variations in weight, finish, inspection, rejection, and methods of testing.

American Assn. of State Highway Officials, M52-42. Standard Specifications for Axle-Steel Bars for Concrete Reinforcement. Gives scope, manufacture, carbon determination, tensile properties, bending properties, test specimens, number of tests, permissible variations in weight, finish, marking, inspection, rejection, and methods of testing.

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for reinforcement—material "structural steel grade" or "intermediate grade," open hearth to comply with A. A. S. H. O. Standard Specification M-31; with tensile requirements to conform to American Society for Testing Materials Specification A-15; bar mat to conform to A. A. S. H. O. Specification M-54; and will mesh to conform to A. A. S. H. O. Specification M-55, order lists, protection, fabrication, placing and fastening, splicing, lapping, substitutions, measurement, and payment.

American Concrete Institute. Proposed Recommended Practice for Use of Metal Supports for Reinforcement, 1941. Includes requirements for supports and their number and locations by means of tables and diagrams.

American Iron and Steel Institute. Steel Products Manual. Section 21, 1940. Concrete Reinforcing Bars. Gives definitions, grades and specifications, weight tolerances, lengths, loading, and inspection.

American Public Works Assn. Specification for Portland Cement Concrete Pavement, F1-39; 1939. For reinforcement steel this organization has adopted the specifications of the A. S. T. M.—(a) wire fabric A185; (b) bars A15; and bar mats A184.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Concrete and Reinforced Concrete Railroad Bridges and Other Structures, Metal Reinforcement. Gives requirements for quality, deformed bars, and size of bars.

American Society for Testing Materials, A 15-39; 1939. American Standards Assn., A50.1-1939. Billet-Steel Bars for Concrete Reinforcement. Covers plain, deformed, and cold twisted bars, plain and deformed in 3 grades, and structural steel, intermediate and hard. Requirements on chemical composition and tensile requirements, bend tests, and permissible variation in weight.

American Society for Testing Materials, A 16-35; 1935. American Standards Assn. A50.2-1936. Rail-Steel Bars for Concrete Reinforcement. Covers plain, deformed, and hot-twisted bars rolled from standard section tee rails. Requirements for tensile and bending properties, preparation of test specimen, permissible variations in weight, finish, and inspection.

American Society for Testing Materials, A 82-34; 1934. American Association of State Highway Officials, M 32-42. American Standards Assn., A50.3-1936. Cold-Drawn Steel Wire for Concrete Reinforcement. For use as wire or in fabricated form for concrete reinforcement. Gives sizes, tensile and bending properties, preparation of test specimen, permissible variations in gage, finish, and inspection.

American Society for Testing Materials, A 160-39; 1939. American Standards Assn., G 43.1-1942. Axle-Steel Bars for Concrete Reinforcement. Covers structural, intermediate, and hard grades of plain and deformed bars, rolled from certain carbon-steel railroad axles. Includes carbon determination, tensile and bending properties, preparation of test specimen, and permissible variations in weight. A. S. T. M. Emergency Alternate Provision EA-A 160; 1942, affected section 2 (Manufacture), section 3 (Carbon Determination), and section 7 (Number of Tests).

American Society for Testing Materials, A 184-37; 1937. American Assn. of State Highway Officials, M54-37. American Standards Assn., G44.1-1942. Fabricated Steel Bar or Rod Mats for Concrete Reinforcement. Covers material in mat (or sheet) form fabricated from steel bars, or rods, in two layers at right angles to each other and clipped or welded to form a grid. Lists suitable bar materials, and gives requirements for clips, fabrication, welds, size and spacing, strength and tests of connections, finish, and inspection.

American Society for Testing Materials, A 185-37; 1937. American Assn. of State Highway Officials, M 55-37. American Standards Assn., G45.1-1942. Welded Steel Wire Fabric for Concrete Reinforcement. Covers welded wire fabric composed of cold-drawn steel wire welded at intersections. Gives method of fabrication, physical properties, tension and bend tests, preparation of specimen, gages and spacings, and inspection.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Standard Reinforcing Bars. Table of standard sizes, areas, and weights, based on U. S. Dept. of Commerce, National Bureau of Standards Simplified Practice Recommendation R 26-42.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Standard Specifications for Axle-Steel Concrete Reinforcement Bars. A. S. T. M. Designation; A 160-39. Covers scope, manufacture, carbon determination, tensile properties, bending properties, test specimens, number of tests, permissible variations in weight, finish, marking, inspection, and rejection.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Standard Specifications for Billit-Steel Concrete Reinforcement Bars. A. S. T. M. Designation, A 15-39. Covers scope, basis of purchase, process, cold-twisted bars, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, test specimens, number of tests, permissible variations in weight, finish, marking, inspection, rejection, and rehearing.

Concrete Reinforcing Steel Institute. Reinforced Concrete, 1943. Standard Specifications for Rail-Steel Concrete Reinforcement Bars. A. S. T. M. Designation, A 16-35. Covers scope, manufacture, hot-twisted bars, tensile properties, bending properties, test specimens, number of tests, permissible variations in weight, finish, inspection, and rejection.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R26-42; 1942. Steel Reinforcing Bars. Simplified practice recommended and accepted by industry establishing a limited list of standard areas of reinforcing bars and the equivalent sizes of round and square bars.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R53-32; 1932. American Standards Assn., A38-1933. Steel Reinforcing Spirals. Simplified practice recommended and accepted by industry establishing a limited list of standard round rod sizes for spiral reinforcement and standard pitches of spiral for various column core sizes and percentages of reinforcement area to concrete area.

U. S. Gov., Federal Specification QQ-B-71a; 1938. Amendment 1; 1940. Bars; Reinforcement, for Concrete. Covers four types—(A) plain, (B) deformed, (C) hot-twisted, and (D) cold-twisted; and five grades; (1) structural, billet-steel; (2) intermediate, billet-steel; (3) intermediate car-axle-steel; (4) hard, billet-steel; and (5) hard, rail-steel. Gives requirements for material, workmanship, twisted bars, permissible variations, chemical composition, manufacturer's analysis, tensile properties, modification in elongation, and bending; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-QQ-B-71a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) added two grades—(6) structural, car-axle-steel and (7) hard, car-axle-steel.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes reinforcing steel.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; concrete building construction, *see* 518.50, 518.51; concrete bridge construction, *see* 518.4.

605.26 Iron and Steel Castings and Forgings

American Society for Testing Materials, A 148-44; 1944. American Standards Assn., G52.1-1944. Alloy-Steel Castings for Structural Purposes. For use where mechanical stresses unaccompanied by high temperatures predominate, including full annealed, normalized and tempered, and liquid quenched and tempered or drawn castings. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, magnetic particle testing, test specimens, number of tests, retests, workmenship, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 148a; 1944, affected section 1, a fourth grade added under class C.

References.—Iron castings, *see* 611.1, 611.2; steel castings, *see* 611.4; iron forgings, steel forgings, *see* 611.3, 611.5.

605.27 Steel Scaffolds and Grandstands

International Assn. of Governmental Labor Officials, endorsing sponsor. American Standards Assn., Z20.1-1941. Specifications for Portable Steel and Wood

Grandstands. (Applicable to all portable grandstands any of whose main structural members are of steel or wood.) Definitions of terms and specifications on approval, design, workmanship, loading, foundations, materials of construction, allowable stresses, and special requirements.

U. S. Gov., Treasury Dept., Procurement Div. 447A; 1941. Scaffold, Steel. Covers the parts of steel scaffolding of knock-down construction, designed to be readily dismantled and assembled without aid of special tools. Gives requirements for sizes, material, tubing, finish, construction, dimensions, frames and braces; methods of sampling, inspection, and tests; and packing and marking.

605.28 Metal Cribbing

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Roadway Protection. Covers retaining structures in sliding cuts. Gives requirements for timber, concrete, and metal cribbing; and dry rubble, masonry, and concrete walls.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Includes metal cribbing.

606. RAILWAY TRACK MATERIAL

606.0 GENERAL ITEMS

American Iron and Steel Institute. Steel Products Manual. Section 19; 1938. Revised, 1943. Railway Track Materials. Covers tee and girder rails, joint bars, track bolts, track spikes, and tie plates. Gives definitions and types, chemical and physical requirements, classification of rails, manufacturing tolerances, marking, loading, definitions relating to manufacture, and specifications for rails; and description and standards, and specifications for joint bars, track bolts, track spikes, and tie plates.

American Mining Congress, Sponsor. American Standards Assn., M7.1-1933 and M7.2-1935. Recommended Practice for Frogs, Switches, and Turnouts for Coal Mine Tracks. Recommendations are shown in detail by a series of drawings divided into section (1) riveted frogs, (2) cast frogs, (3) switches, (4) guard rails, (5) turnouts, and (6) switch stands; and include drawings for light rail, 20 to 60 lb., turnouts (M7.1-1933), and drawings for heavy rails, 70 and 80 lb., turnouts (M7.2-1935).

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for the Laying of New Track, 1940; and Specifications for Laying Rail, 1941.

American Transit Assn. Standard Third-Rail Terminology, W2-15; 1915. Defines the meaning of the terms "Bond" and "Third-Rail Gauge."

American Transit Assn. Standard Designs and Engineering Data for Turnouts and Crossovers for Tongue Switch Construction, W10-21; 1921. Contains dimensional designs relative to standard lateral or side turnouts, standard equilateral or Diamond turnouts, and standard crossovers for tongue switch construction.

American Transit Assn. Standard Method of Designating Compromise Joints, W12-23; 1923. Includes a diagram illustrating proper method of naming compromise joints.

American Transit Assn. Standard Special Trackwork Layouts, W13-37; 1937. Covers standard system of uniform track spirals, simplified system of single branchoff frogs, and car clearance easements with standardized frogs for various gages, and includes numerous drawings and tables covering these subjects.

American Transit Assn. Standard Diagram Showing Proper Location of Tongue Switches. W14-22; 1922.

American Transit Assn. Standard Recommended Distances Between Tangent Track Centers Through Special Trackwork Layouts for All Track Gauges. W35-28; 1928.

American Transit Assn. Standard Rules for the Determination of Flangeways and Gauges on Curves, W40-35; 1935. This specification presents the necessary information and rules for determining the flangeways and guard distances that are proper for actual use under the conditions covered by the rules. Allowance has been made for permissible variations in the manufacture and installation of the special trackwork as well as for other similar variations in the flange dimensions and wheel setting.

American Transit Assn. Standard Protection of Contact-Rail Where Protected Third-Rail is Used, W45-29; 1929. The two types represent the general standards for protection as established by roads using the third-rail distribution system for over-running contact third-rail and for under-running contact third-rail.

American Transit Assn. Recommended Specification for Street Railway Track Construction, W113-28; 1928. This specification covers the construction of electric railway track in paved city streets. It covers items relating to excavation, sub-soil and surface drainage, types of foundation, kind of rails, rail joints, bonds, rail fastenings, ties, pavement base, rail filler, and method of paving the street.

American Transit Assn. Recommended Specification and Preferred Names for Rail Joints and Parts, W125-30; 1930. Gives a recommended list of preferred names and definitions therefor covering rail joints and parts.

American Transit Assn. Recommended Design for Girder Grooved and Girder Guard Rail Sections and Splice Bars for A. A. R. (Mechanical Div.) Flanges, W127-31; 1931. Gives dimensions, designs for various types of girder grooved rail sections and splice bars for girder grooved rails.

American Transit Assn. Recommended Design for Branding and Stamping for Rails, W128-31; 1931. Includes design of letters and numerals to be used in stamping.

References.—Wood ties, *see* 401; rock and stone ballast, *see* 511.73; track bonds and bonding, *see* 718.49; track tools, *see* 616.8.

606.1 STEEL RAILS, TEE, AND GIRDER

American Iron and Steel Institute. Steel Products Manual. Section 19; 1938. Revised, 1943. Railway Track Materials. Covers tee and girder rails, joint bars, track bolts, track spikes, and tie plates. Gives definitions and types, chemical and physical requirements, classification of rails manufacturing tolerances, marking, loading, definitions relating to manufacture, and specifications for rails; and description and standards, and specifications for joint bars, track bolts, track spikes, and tie plates.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Revised, 1944. Emergency Provisions adopted March 19, 1942, for Specifications for Open-Hearth Steel Rails. Provides for changes in requirements for chemical composition, ductility and resistance to impact, interior condition and finishing; and adds requirements for control cooling.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Open-Hearth Steel Girder Rails of Plain, Grooved, and Guard Types, 1936. Gives requirements for manufacture, chemical and physical properties and tests, standard sections, lengths, widths, workmanship, finish, drilling, milling, punching, classification, marking, loading, and inspection. Prepared in cooperation with the American Transit Engineering Assn. and Rail Manufacturers.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Open-Hearth Steel Rails, 1942. Gives requirements for chemical composition, average carbon, analyses, ductility and resistance to impact, elongation and permanent set, interior condition, classification (No. 1 rails, X-rails, No. 2 rails), and details of manufacture.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Standard Rail Sections (R.A.-A 90-lb., R.E. 100-lb., R.E. 112-lb., and R.E. 131-lb.).

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Standard Sections for Grooved and Guard Girder Rails (128-lb. R.E., 149-lb. R.E., 159-lb. R.E., and 174-lb. R.E.; and joint bars—128-lb. R.E., and 159-lb. R.E.)

American Society for Testing Materials, A1-39; 1939. American Railway Engineering Association Specification for Carbon-Steel Rails. Open-Hearth Carbon-Steel Rails. For Standard tee rails. Gives requirements as to chemical composition, mill practices, ladle analysis, drop test, elongation, Brinell indentation, section, weight, finish, classification of rails and inspection. A.S.T.M. Emergency Alternate Provision (EA-A 1a; 1943) affected Section 5 (Chemical Composition), section 10d (Supports for the Test Specimens), section 11a (Height of Free Fall of Tup), section 13 (Interior Condition), section 15 (Brinell Indentation), section 20 (Finish), and section 21b (Classification of X-Rayls); and adds a new section covering requirements for control cooling.

American Society for Testing Materials, A 2-27; 1927. American Railway Engineering Assn. Specification for Steel Girder Rails. American Transit Engineering Assn., Standard W1-31. Open-Hearth Steel Girder Rails of Plain, Grooved, and Guard Types. For 3 classes of steel girder rails; requirements as to chemical composition, mill practices, impression test, section, weight, drilling, milling, punching, classification of rails, and inspection.

American Transit Assn. American Standards Assn., E4-1933. Standard Design for Seven-Inch Girder Grooved Rail, W6-31; 1931.

American Transit Assn. American Standards Assn., E5-1933. Standard Design for Nine-Inch Girder Grooved Rails, W7-31; 1931.

American Transit Assn. American Standards Assn., E6-1933. Standard Design for Seven-Inch Girder Guard Rail, W8-31; 1931.

American Transit Assn. American Standards Assn., E7-1933. Standard Design for Nine-Inch Girder Guard Rail, W9-31; 1931.

American Transit Assn. American Standards Assn., E8-1933. Seven-Inch 82-Lb. Plain Girder Rail and Splice Bars.

American Transit Assn. American Standards Assn., E9-1933. Seven-Inch 92-Lb. Plain Girder Rail and Splice Bars.

American Transit Assn. American Standards Assn., E11-1933. Seven-Inch 102-Lb. Plain Girder Rail and Splice Bars.

American Transit Assn. Standard Specification for the Manufacture of Open-Hearth Steel Girder Rails of Plain, Grooved and Guard Types, W1-31; 1931. This specification covers the manufacture of open-hearth steel girder rails for classes A, B, and C. Specification gives detailed requirements concerning manufacture, chemical and physical properties and tests, workmanship and finish, drilling, milling and punching, classification of rails, marking, and inspection. Substantially the same as American Society for Testing Materials Specification A2.

American Transit Assn. Standard Design for Seven-Inch Girder Grooved Rail, W6-31; 1931. Gives diagram showing dimensions and table showing details.

American Transit Assn. Standard Design for Nine-Inch Girder Grooved Rail, W7-31; 1931. Gives diagram showing dimensions and table showing details.

American Transit Assn. Standard Design for Seven-Inch Girder Guard Rail, W8-31; 1931. Gives diagram showing dimensions and table showing details.

American Transit Assn. Standard Design for Nine-Inch Girder Guard Rail, W9-31; 1931. Gives diagram showing dimensions and table showing details.

American Transit Assn. Standard Specification for Carbon-Steel Rails of Standard Section, W16-37; 1937. This specification covers the manufacture of steel rails of standard section, as distinguished from girder grooved, girder guard, and plain girder rails. Gives detailed requirements as to manufacture; chemical and physical properties and tests; length and weight of standard section; holes for bolt, bond and tie rods; classification of rails; marking, and inspection and rejection. This specification is identical in substance with A.S.T.M. Specification A-1, except for certain sections.

American Transit Assn. Standard Design for Light Seven-Inch Girder-Grooved Rail, W28-31; 1931.

American Transit Assn. Standard Design of Plain Girder Rails and Splice Bars, W31-31; 1931. Includes splice bars for 7-in. rails, 80-, 90-, and 100-lb. weights, standard dimensions, drilling of splice bars, and sizes of bolts.

American Transit Assn. Recommended Design for Four and One Half Inch Girder Grooved Rail, W142-35; 1935.

National Association of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Steel; Rail or Rerolled. Covers definition, properties, raw material specification, products available, and uses.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Research Paper RP408; 1932. Tensile Properties of Rail Steels at Elevated Temperatures. In continuation of previously reported work on a study of transverse fissure failures in railroad rails, a further series of tensile tests at elevated temperatures has been made on a number of rails representing different conditions of manufacture and service to determine the extent to which secondary brittleness occurred in these materials.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-2A; 1937. Rail, Open Hearth Carbon Steel.

References.—Alloy steel rails, *see* 622.2; methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; track construction, *see* 606.0.

606.2 RAIL JOINT PLATES AND TIE PLATES

American Iron and Steel Institute. Steel Products Manual. Section 19; 1938. Revised, 1943. Railway Track Materials. Covers tee and girder rails, joint bars, track bolts, track spikes, and tie plates. Gives definitions and types, chemical and physical requirements, classification of rails manufacturing tolerances, marking, loading, definitions relating to manufacture, and specifications for rails; and description and standards, and specifications for joint bars, track bolts, track spikes, and tie plates.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Emergency Provisions adopted March 19, 1942, for Specifications for Medium-Carbon Steel Tie Plates. Provides for elimination of copper content.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for High-Carbon-Steel Joint Bars, 1936. Gives requirements for process, chemical composition, ladle and check analyses, tension and bend tests, finish, marking and stamping, inspection, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Quenched Carbon-Steel Joint Bars, 1936. Gives requirements for process, chemical composition, ladle and check analyses, tension and bend tests, finish, marking and stamping, inspection, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Standard Sections—Designs of Tie Plates for R.A.-A and R.E. Rail Sections, 1937. Emergency Provisions Adopted June 15, 1942, and in effect April 1943 admitted additional designs permitting manufacturers to use existing equipment and eliminates use of copper-bearing steel.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Standard Sections for Joint Bar and Assembly (90-lb. R.A.-A rail, 100-lb. R.E. rail, 112-lb. R.E. rail, and 131-lb. R.E. rail).

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Medium-Carbon Steel Tie Plates. Gives requirements for manufacture, chemical and physical properties and tests, workmanship and finish, marking, and inspection. Emergency Specifications for Soft and Medium Steel Tie Plates, adopted Dec. 31, 1942, and revised July 1, 1944, superseded the above specifications for the duration of the emergency.

American Society for Testing Materials, A 3-33; 1933. A.T.E.A. Standard, W17-37. Low-Carbon Steel Joint Bars. Gives requirements for chemical composition, ladle analysis, tensile and bending properties, preparation of test specimen, workmanship, and inspection.

American Society for Testing Materials, A 4-14; 1914. American Transit Engineering Association Standard W18-22. Medium-Carbon Steel Joint Bars. Requirements as to finishing, chemical composition, ladle analysis, tensile and bending properties, preparation of test specimen, workmanship, and inspection.

American Society for Testing Materials, A 5-39; 1939. High-Carbon Steel Joint Bars. For general use in standard railroad tracks; requirements for chemical composition, ladle analysis, tensile and bending properties, preparing of test specimen, workmanship, and inspection.

American Society for Testing Materials, A 49-39; 1939. Quenched Carbon-Steel Joint Bars. For general use in standard railroad tracks; requirements as to chemical composition, heating and quenching, ladle analysis, tensile and bending properties, preparing of test specimen, workmanship, finish, and inspection.

American Society for Testing Materials, A 67-33; 1933. A.T.E.A. Standard W23-37. Steel Tie Plates. Includes soft and medium grade of steel tie plates. Gives requirements for chemical composition, ladle analysis, bending properties, preparation of test specimen, permissible variations in dimension, workmanship, and inspection.

American Society for Testing Materials, A 241-41; 1941. Hot-Worked High-Carbon Steel Tie Plates. For general use in standard railroad tracks. Gives chemical composition, ladle analysis, bending properties, test specimens, number of tests, permissible variations in dimensions, weight, workmanship and finish, marking, inspection, and rejection.

American Transit Assn. American Standards Assn., E2-1923. Standard Design for Splice Bars for Seven-Inch Girder Grooved and Guard Rails, W4-1922.

American Transit Assn. American Standards Assn., E3-1923. Standard Design for Splice Bars for Nine-Inch Girder Grooved and Guard Rails, W5-22; 1922.

American Transit Assn. American Standards Assn., E8-1933. Seven-Inch 82-lb. Plain Girder Rail and Splice Bars.

American Transit Assn. American Standards Assn. E9-1933. Seven-Inch 92-Lb. Plain Girder Rail and Splice Bars.

American Transit Assn. American Standards Assn., E11-1933. Seven-Inch 102-Lb. Plain Girder Rail and Splice Bars.

American Transit Assn. Standard Design for Splice Bars for Seven-Inch Girder Grooved and Guard Rails, W4-22; 1922. Gives diagram showing angles, dimensions, rail drilling, and splice punching.

American Transit Assn. Standard Design for Splice Bars for Nine-Inch Girder Grooved and Guard Rails, W5-22; 1922. Gives diagram showing angles, dimensions, rail drilling, and splice punching.

American Transit Assn. Standard Specification for Low Carbon-Steel Splice Bars, W17-37; 1937. Gives detailed requirements as to method of manufacture, chemical and physical properties and tests, workmanship and finish, marking, and inspection and rejection. This specification is identical with A.S.T.M. Specification A3.

American Transit Assn. Standard Specification for Medium Carbon-Steel Splice Bars, W18-22; 1922. Gives detailed requirements as to method of manufacture, chemical and physical properties and tests, workmanship and finish, marking, and inspection and rejection. This specification is identical with A.S.T.M. Specification A4.

American Transit Assn. Standard Specification for High Carbon-Steel Splice Bars, W19-22; 1922. Gives detailed requirements as to method of manufacture, chemical and physical properties and tests, workmanship and finish, marking, and inspection and rejection. This specification is identical with A.S.T.M. Specification A5.

American Transit Assn. Standard Specification for Extra High Carbon-Steel Splice Bars, W20-22; 1922. Gives detailed requirements as to method of manufacture, chemical and physical properties and tests, workmanship and finish, marking, and inspection and rejection.

American Transit Assn. Standard Specification for Steel Tie Plates, W23-37; 1937. This specification covers two grades of steel tie plates, namely—soft and medium. Gives detailed requirements as to method of manufacture, chemical and physical properties and tests, permissible variations, workmanship and finish, marking, and inspection and rejection. This specification is identical in substance with A.S.T.M. Specification A67-33.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-3; 1926. Bar; Splice, Carbon Steel.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-6; 1927. Plate; Tie, Steel.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; track construction, *see* 606.0.

606.3 SWITCHES AND SPECIAL TRACK WORK

American Mining Congress, sponsor. American Standards Assn., M7.1-1933 and M7.2-1935. Recommended Practice for Frogs, Switches, and Turnouts for Coal Mine Tracks. Recommendations are shown in detail by a series of drawings divided into section (1) Riveted Frogs, (2) Cast frogs, (3) Switches, (4) Guard Rails, (5) Turnouts, and (6) Switch Stands; and include drawings for light rail, 20 to 60 lb., turnouts M7.1-1933; and drawings for heavy rail, 70 and 80 lb., turnouts M7.2-1935.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for One, Two, Three and Four-Track Overhead Metal Warning and Metal Side Warning. Covers the design, materials, and erection of metal overhead warnings. Gives footing; materials including base casting and pipe cap, iron pipe and fittings, including collars, straps and hanger clamps, galvanized steel pipe and fittings, steel guy and messenger strand, galvanized cable clamps and thimbles, hook and eye galvanized turnbuckles, wood lash bars and fingers, telltales for overhead warnings, spring finger for side warning, spring for side warning brackets, bolts, and steel bar; erection; and painting.

American Railway Engineering Assn. Construction and Maintenance Section., Assn. of American Railroads in collaboration with Manganese Track Society. Trackwork Plans. Includes plans showing standard designs, construction, and materials for switches, switch stands, bolted rigid frogs, spring rail frogs, guard rails, rail bound and solid manganese frogs, bolted rail crossings, manganese insert crossings, solid manganese crossings, turnout and cross-over data, and track construction for paved streets; and data for rail sections.

American Transit Assn. Standard Dimensions of Switches and Mates, W11-30; 1930.

American Transit Assn. Standard Dimensions of Frogs for Crossovers and Turnouts, W15-37; 1937.

American Transit Assn. Standard Specification for Solid Manganese-Steel Special Trackwork for Girder Rail, W32-30; 1930. This specification covers the manufacture of special trackwork wherein the tongue switches, mates, frogs and crossings are made of solid manganese-steel. The term "solid manganese" shall be considered as distinguishing such special trackwork from other types wherein manganese-steel is used only for inserts at points receiving the principal wear. Specification includes chemical and physical properties and tests, design, workmanship, assembly and finish, marking and shipping, and inspection.

American Transit Assn. Standard Specification for Plain Bolted Special Trackwork, W33-30; 1930. This specification covers the manufacture of special trackwork wherein switches, mates, frogs, crossings, curves, guard rails and connecting rails are made of rolled steel rails properly shaped by machining or grinding and secured together by means of cast-iron, cast, forged or rolled steel fillers, bolts, rivets and plates. This specification includes chemical and physical properties and tests, design, workmanship, assembly and finish, marking and shipping, and inspection.

American Transit Assn. Standard Specification for Rail-Bound Insert Type Special Trackwork, W34-30; 1930. This specification covers the manufacture of special trackwork wherein the switches, mates, frogs, and crossings are made of cast manganese steel inserts, at the points of greatest wear, secured in place by rolled steel rails properly machined and bolted thereto. This specification includes chemical and physical properties and tests, design, workmanship, assembly and finish, marking and shipping, and inspection.

American Transit Assn. Standard Design of Bolted Rail Crossings; Steam Railroad Over Electric Railway, W39-35; 1935. Gives dimensional designs of bolted rail crossings for angles 90 deg. to 50 deg. inclusive.

American Transit Assn. Standard Design of Bolted Rail Crossings; Steam Railroad Over Electric Railway, W43-35; 1935. Gives dimensional designs of bolted rail crossings for angles below 50 deg. to 30 deg. inclusive.

American Transit Assn. Recommended Specification for Materials for Use in the Manufacture of Special Trackwork, W104-37; 1937. This specification covers the manufacture, chemical and physical properties, and tests of materials entering into the manufacture and assembly of special trackwork for steam electric and industrial tracks of all gages and types, for rail of 50 lb. per yard and over, under any motive power, and in either open or paved track.

American Transit Assn. Recommended Specification for Cast-Steel Construction Hard-Center Special Trackwork, W106-27; 1927. This specification covers the manufacture of special trackwork wherein the tongue switches, mates, frogs, and crossings are made of steel castings with hard centers of special steel inserted at points receiving the principal wear. It gives detailed requirements as to kind of materials, chemical and physical properties and tests, designs, workmanship and finish, marking, and inspection of materials referred to.

American Transit Assn. Recommended Specification for Iron-Bound Hard-Center Special Trackwork, W107-29; 1929. This specification covers the manufacture of special trackwork wherein the tongue switches, mates, frogs, and crossings are made principally of rolled rail arms bound together by cast iron bodies having recesses to receive the hard steel centers which form the running portions between the rolled rail arms, and at points receiving the principal wear. It gives detailed requirements as to kind of materials, chemical and physical properties and tests, designs, workmanship and finish, marking, and inspection of materials referred to.

American Transit Assn. Recommended Design for Minimum Dimensions for Center Plates for Single and Middle Frogs, W122-27; 1927.

American Transit Assn. Recommended Designs for Covering All Switches of the Radii Shown in Manual, Section W11-30; W129-33; 1933. Gives dimensional diagrams of solid manganese steel lateral tongue switch, 100 ft. radius and 200 ft. center radius; equilateral tongue switch, 200 and 350 ft. center radius; lateral tongue switch, 50 and 75 ft. center radius, and equilateral tongue switch, 100 ft. center radius; heel of tongue switches, cross section at heel; bending and grinding directions for converting tongue from standard 200 ft. lateral switch for use in standard 350 ft. equilateral switch, and heel tightening bar and cover for tongue switches.

American Transit Assn. Recommended Design for Mates, W130-34; 1934. Includes dimensional diagram for formation of flangeways for mates.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1927. Derails. Not to be used in main tracks, but on heavy grades, where necessary, properly designed deflecting tracks may be used.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-8; 1929. Frog, Bolted Rigid, No. 8, 85-Pound Rail.

References.—Manganese steel track work, *see* 622.5, 622.9; methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; heat treatments, *see* 600.5; track construction, *see* 606.0.

606.4 TRACK BOLTS, NUTS, AND WASHERS

American Iron and Steel Institute. Steel Products Manual. Section 19, 1938. Revised, 1943. Railway Track Materials. Covers tee and girder rails, joint bars, track bolts, track spikes, and tie plates. Gives definitions and types, chemical and physical requirements, classification of rails manufacturing tolerances, marking, loading, definitions relating to manufacture, and specifications for rails; and description and standards and specifications for joint bars, track bolts, track spikes, and tie plates.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual of Railway Engineering, 1936. Design for Track Bolts. Gives drawings for oval neck track bolts and elliptic neck track bolts; and tables showing dimensions for oval neck track bolts with special sizes for use during transition period, elliptic neck track bolts special type and sizes for use during transition period, and square and hexagonal nuts for track bolts with special sizes for use during transition period.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Revised, 1944. Emergency Provisions adopted March 19, 1942, for Specifications for Heat-Treated Carbon-Steel and Alloy-Steel Track Bolts. Provided that alloy-steel track bolts need not be supplied during the emergency, and permitted other wrench-tight fits than those specified.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Heat-Treated Carbon-Steel and Alloy-Steel Track Bolts, 1939. Gives requirements for process, chemical properties and tests, physical requirements, design and tolerances, manufacture, and marking and inspection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering Specifications for Spring Washers, 1936. Gives requirements for material, physical properties, manufacture, identification, and acceptance.

American Society for Testing Materials, A 76-33; 1933. A.T.E.A. Standard W36-37. Low-Carbon Steel Track Bolts and Nuts. Gives requirements for chemical composition, ladle analysis, tensile and bending properties, preparation of test specimen, permissible variations in dimensions, threads and thread fit, and inspection.

American Society for Testing Materials, A 183-40T; 1940. Tentative Specifications for Heat-Treated Carbon and Alloy-Steel Track Bolts and Nuts. For two grades of carbon-steel track bolts, alloy-steel track bolts, and nuts; requirements as to chemical compositions, tensile and bending properties, test specimen, strip tests, permissible variations in dimensions, threads and thread fit. A.S.T.M. Emergency Alternate Provision EA-A 183; 1942, affected section 1 (Scope), section 3 (Chemical Composition), section 4 (Ladle Analysis), section 6 (Tensile Properties), section 8 (Bending Properties), and section 14 (Threads and Thread Fit).

American Transit Assn. Standard Specification for Quenched, Carbon-Steel Track Bolts, W21-37; 1937. Gives detailed requirements as to method of manufacture, chemical and physical properties and tests, permissible variations, workmanship and finish, marking, and inspection and rejection. This specification is identical in substance with A.S.T.M. Specification A183.

American Transit Assn. Standard Specification for Low Carbon-Steel Track Bolts, W36-37; 1937. This specification covers detailed requirements as to method of manufacture, chemical and physical properties and tests, permissible variations, workmanship and finish, marking, inspection and rejection of bolts. This specification is identical in substance with A.S.T.M. Specification A76.

American Transit Assn. Recommended Design for Track Bolts and Track Bolt Nuts, W126-31; 1931. Includes dimensions for various sizes of oval neck track bolts and square and hexagonal nuts.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn., B18d-1930. Track Bolts and Nuts. Dimensions, thread length, and number of threads for oval neck and elliptic neck track bolts and for square and hexagonal nuts, tables of special sizes for use during transition from present usage to standard sizes.

References.—Alloy steel track bolts, *see* 622.1; methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; heat treatments, *see* 600.5; track construction, *see* 606.0.

606.5 TRACK SPIKES

American Iron and Steel Institute. Steel Products Manual. Section 19; 1938. Revised, 1943. Railway Track Materials. Covers tee and girder rails, joint bars, track bolts, track spikes, and tie plates. Gives definitions and types, chemical and physical requirements, classification of rails manufacturing tolerances, marking, loading, definitions relating to manufacture, and specifications for rails; and description and standards, and specifications for joint bars, track bolts, track spikes, and tie plates.

American Society for Testing Materials, A 65-33; 1933. A.T.E.A. Standard, W 25-37. Soft Steel Track Spikes. Gives requirements for chemical composition, ladle analysis, tensile and bending properties, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, A 66-33; 1933. A.T.E.A. Standard, W 24-37. Steel Screw Spikes. Gives requirements for finishing, tensile and bending properties, permissible variations in dimensions, finish, marking, inspection, and rejection.

American Transit Assn. Standard Specification for Steel Screw Spikes, W24-37; 1937. Gives detailed requirements as to method of manufacture, physical properties and tests, workmanship and finish, permissible variations, marking, and inspection and rejection. This specification is identical in substance with A.S.T.M. Specification A66.

American Transit Assn. Standard Specification for Steel Track Spikes, W25-37; 1937. Gives detailed requirements as to method of manufacture, chemical and physical properties and tests, workmanship and finish, permissible variations, marking, and inspection and rejection. This specification is identical in substance with A.S.T.M. Specification A65.

American Transit Assn. Standard Design for 5 1/2 In. by 9/16 In. Track Spike, W41-30; 1930.

References.—Methods of testing, general requirements for metals, *see* 600.1; heat treatments, *see* 600.5; track construction, *see* 606.0.

606.6 TRACK TIE RODS

American Transit Assn. Standard Specification for Design and Manufacture of Tie Rods, W42-37; 1937. This specification covers the design and manufacture of low carbon steel tie rods of the round or flat types, for use in street railway track. It includes requirements as to method of manufacture, chemical properties, workmanship and finish, permissible variations, marking, and inspection of tie rods.

References.—Methods of testing, general requirements for metals, *see* 600.1; commercial quality bar steel, *see* 603.23.

606.7 TRACK BRACES

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-7; 1929. Brace; Rail.

607. TUBULAR PRODUCTS AND FITTINGS, COCKS, AND VALVES

607.0 GENERAL ITEMS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Pumps and Piping Systems. Include requirements for bilge and ballast systems, boiler feed system, steam and exhaust piping, lubricating oil systems, fuel oil transfer and filling systems, fuel oil service systems, cargo oil systems, vent, sounding and overflow pipes, piping details, and fire protection.

American Gas Assn. Requirements and Recommended Practice for House Piping and Appliance Installation, 1940. These requirements should be construed as basic standards governing the installation of house piping and gas appliances and they have been prepared to specify results rather than outline in detail how such results shall be obtained. Covers general requirements for house piping, recommended practice for house piping, recommended practice for gas meters, general requirements for appliance installation, recommended practice for appliance installation, recommended practice for flue connections, and appendix.

American Petroleum Institute, Div. of Production, Standard 5-B; 1941. Specifications for the Inspection of Threads on Oil Country Tubular Goods. Covers the instruments and methods for the inspection of all thread dimensions, such as lead, taper, thread height, angle, and thread form.

American Petroleum Institute, Div. of Production, Code 5-C-1; 1938. Supplement 1; 1941. Code of Recommended Field Practice on Care and Use of Oil Country Tubular Goods—Transportation, Storage, Handling, and Reconditioning of Casting, Drill Pipe, and Tubing.

American Petroleum Institute, Div. of Production, Code 5-C-2; 1944. Performance Properties of Casing and Tubing. Gives minimum performance properties for casing and tubing. The values shown herein for casings are final, and are based mainly upon tests; and the values for tubing are tentative, and are calculated. Gives tables showing outside diameter, nominal weight, inside diameter, wall thickness, drift diameter, collapse resistance, internal yield pressure, and joint strength for various sizes.

American Petroleum Institute, Div. of Production, Standard 7-B; 1944. Specification for Rotary Drilling Equipment. Gives final dimensional standards, including gages, for regular and full-hole rotary drilling tool joints, tentative standards for internal-flush rotary drilling tool joints, and standards on auxiliary equipment. Covers material, workmanship and finish, marking, rotary drilling tool joints, drill collars, grief stems, couplings, and subs, bits, gaging practice, swivel gooseneck connections and rotary hose, rotary table, brake blocks, slush pumps, recommended practice on measurement, inspection and rejection, gages and appendices.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Pipe Line Crossings Under Railway Tracks. Pipe lines are those installed to carry oil, gas, gasoline, or other inflammable or highly volatile substance, under pressure. Gives requirements for carrier pipe, casing pipe, seals, depth of casing, length of casing, shut-off valves, location, and topography.

American Society of Mechanical Engineers, joint sponsor with National Safety Council. American Standards Assn., A 13-1928. Scheme for the Identification of Piping Systems. Classification of piping according to the character of material carried, assignment of one color to each main class, use of a color band and auxiliary color strip or legend to identify each pipe as to main class and subclass.

American Society of Mechanical Engineers and American Gas Association, joint sponsors. American Standards Assn., B 2.1-1942. Pipe Threads. Covers dimensions and specifications for taper and straight pipe thread for railing fittings, for assembly with flanges for high pressure-temperature service, pressure tight joints, mechanical joints, and locknut connections.

American Society of Mechanical Engineers, sponsor, American Standards Assn., B31.1-1942. Code for Pressure Piping. Represents a standard of minimum safety requirements for—(1) the selection of suitable materials and reference to standard specifications by which they may be secured, (2) the designation of proper dimensional standards for the elements comprising piping systems, (3) the design of the component parts as well as the assembled unit including necessary supports, (4) the erection of these systems, and (5) the test of the elements before erection and of the completed systems after erection. Section 4—District Heating Piping Systems, endorsed by the National District Heating Assn.

American Society of Mechanical Engineers, sponsor. American Standards Assn., B33.1-1935. Hose Coupling Screw Threads. For all connections having nominal inside diameters of 1/2, 5/8, 3/4, 1, 1 1/4, 1 1/2, and 2 in.

American Society of Mechanical Engineers. Flow of Water in Pipes and Pipe Fittings, 1941. Covers accurate data on flow of water in pipe, friction losses, and artificial roughness. Tests were made with five sizes of brass pipe ranging from 1/2 in. in diameter to 4 in. thirteen sizes of new wrought iron pipe ranging from 1/4 in. in diameter to 8 in., 4 in. and 8 in. new cast iron pipe, and old rusty pipe and pipes containing two types of artificial roughness. Also reports experiments made to determine the friction loss in various pipe fittings arranged in a variety of ways relative to each other.

American Water Works Assn. Specifications for Uniform Marking for Fire Hydrants, 7F.3-1940. Hydrants are rated in terms of their relative capacity and divided into three classes—(A) flow capacity of 1,000 g.p.m. or greater, (B) flow capacity of 500 to 1,000 g.p.m., and (C) flow capacity of less than 500 g.p.m. All barrels of public hydrants are to be painted chrome yellow and the top and nozzle caps of class (A) green, class (B) orange, and class (C) red.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention 13.21; 1941. Piping Systems for Flammable Liquids. Covers general conditions, flexible connections, outdoor piping, indoor piping, and valves and emergency shut-off devices.

Associated Factory Mutual Fire Insurance Companies. Pamphlet 71; 1939. Double Check Valves on Fire-Device Connections. Covers introduction, installation of double check valves, maintenance of double check valves, testing, and cleaning.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1942. Specification for Pipe Thread. Refers to Specifications 122 and 123 for pipe thread for 1-in. signal pipe and adopts American Standards Assn. B2 for pipe threads for other than 1-in. signal pipe.

International Association of Milk Sanitarians jointly with International Association of Milk Dealers and Dairy Industries Supply Assn. Three Associations Standards (undated). The committees from the three associations have accepted standards for—(1) recessless sanitary union for sanitary milk pipe lines, (2) threaded fittings including bends for use with this union, and (3) improved indicating and recording thermometer connections for tanks, vats, and pipe lines. Gives drawings of the sanitary union and drawings with tables showing dimensions for various threaded fittings including bends and thermometer connections.

Manufacturers Standardization Society of the Valve and Fittings Industry. By-Pass Size Standard, SP-5; 1937. This standard covers fabricated by-pass equipment for cast iron and steel valves in two series, for steam, and for gases or liquids, 4-to-24-in. main valve sizes; locations for gate valves, globe valves, and angle valves.

Manufacturers Standardization Society of the Valve and Fittings Industry. Roughing-In Dimensions for Low Pressure Radiator Valves, Union Elbows and Return-Line Vacuum Valves, SP-3; 1944. Gives roughing-in measurements for standard 1/2 to 2-in. low pressure radiator valves, union elbows, and return-line vacuum valves.

Manufacturers Standardization Society of the Valve and Fittings Industry. Standard Finishes for Contact Faces of the Connecting-End Flanges of Ferrous Valves and Fittings, SP-6; 1939. Includes a plain face, raised face, double male, large male and female, small male and female, large and small tongue and groove, and ring joint flanges. Applications and definitions of finishes for cast iron and steel contact faces.

Manufacturers Standardization Society of the Valve and Fittings Industry. Spot Facing Standard for Bronze, Iron and Steel Flanges, SP-9; 1942. To establish maximum and minimum dimensions that reflect the tools and equipment now in common use and to set up a table of dimensions for convenient reference. Applies primarily to the spot facing of pipe flanges in brass, iron or steel when cast integral with valves and fittings, as well as the companion flanges used with this product. Gives diagram and table showing maximum and minimum spot face diameter for standard bolt sizes from 1/2 in. to 3 1/2 in.

Manufacturers Standardization Society of the Valve and Fittings Industry. Standard Marking System for Valves, Fittings, Flanges, and Unions, SP-25; 1936. Addendum 1; 1938. This marking system indicates materials and temperature-pressure service ratings, gives primary and mandatory markings, method of application, rules for marking, and tables which apply to each specific product. Includes gas, air, liquid, oil, steam, and water service; also valves, fittings, and flanges, unions and union fittings.

Manufacturers Standardization Society of the Valve and Fittings Industry. Railing Fittings, Male and Female Threads, SP-35; 1936. Description and dimensional drawings of modified short thread for use in pipe railings, basically same as the American standard taper pipe thread, using the larger end of the thread, and recessing the fitting to cover the imperfect threads on the pipe.

National Board of Boiler and Pressure Vessel Inspectors. Safety Valve Capacity Tests, 1944. Gives detailed data on the capacities of safety valves as manufactured by the leading companies and certified by the N.B.B.P.V.I. Capacities determined in accordance with the rules formulated by the A.S.T.M. Boiler Code Committee.

National Board of Fire Underwriters. Supervision and Care of Valves Controlling Water Supplies for Fire Protection, No. 26; 1931. Requirements for open valves in proper operating conditions, and for supervision of reopening after necessary repairs or alterations. Identification of valves, supervisory service classifications, by central station service, proprietary signal, and local, sealing, and notification systems, and suggested precautions while water is shut off.

National Board of Fire Underwriters. City Gas Piping and Fittings, No. 54; 1943. Standards for the installation, maintenance and use of piping, appliances and fittings for city gas. Covers general requirements, inspection and tests, services and meters, piping valves and fittings, appliances, turning gas on and off, and appendix.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Anaesthetic Gases and Oxygen in Hospitals. Recommended good practice for construction and installation of piping systems for the distribution of anaesthetic gases and oxygen in hospitals and similar occupancies, and for construction and operation of oxygen chambers. General requirements, including color identification of pipe lines, manifolding anaesthetic cylinders to headers for distribution, emergency shut-off valves, lighting, heating and air conditioning apparatus, static precautions, open flames, fire protection, and oxygen tents.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Refrigeration Safety Code, Safety Code for Mechanical Refrigeration. Covers definitions, building occupancy classification, refrigerating system classification by type, refrigerant classification, institutional occupancies, public assembly occupancies, residential occupancies, commercial occupancies, industrial occupancies, installation requirements, refrigerant piping, valves, fittings, design, construction, safety devices, tests, and instructions.

National Fire Protection Assn., sponsor. American Standards Assn., Z27-1933. Recommended Practice for the Installation, Maintenance, and Use of Piping and Fittings for City Gas. These provisions are intended to apply to the installation of gas piping in buildings and the use of city gas, that is, natural, and manufactured or mixed. They do not apply to large underground gas distributing systems leading up to buildings and such parts of a gas system as the manufacturing plants, etc., which are the properties of gas companies.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. SAE Standard Pipe Threads. Revised, 1944. Gives taper and form of thread, diameter and length of thread, length of engagement, straight pipe threads, gaging, tools, and gives diagrams and tables showing dimensions for various types of standard threads.

Technical Assn. of the Pulp and Paper Industry. Piping Systems Color Code. Standard E1 p-34; 1934. Gives a list of color bands and color stripes on bands for piping systems using steam, water, oil, compressed air, size, sulphite pulps, black liquor, sludge, etc.

U. S. Gov., Army-Navy Aeronautical Specification AN-GGG-P-363-2; 1942. Pipe-Threads; Taper, Aircraft (American National Form Symbol NPT).

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-367. Flagpole; Tubular Steel.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); American National pipe threads, (taper pipe threads, modified taper pipe threads, and straight pipe threads); American National hose-coupling and fire-hose coupling threads; and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Joint sponsor with American Gas Assn. American Standards Assn., K2-1927. Gas Safety Code for Installations and Work in Buildings. Definitions, rules for gas fitting and for installation of gas appliances with notes amplifying the rules.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R57-32; 1932. Wrought Iron and Wrought Steel Pipe Valves, and Fittings. This recommendation establishes a schedule of diameters and thicknesses of wrought iron and wrought steel pipe valves, and fittings. It covers nominal inside and outside diameters and approximate thicknesses for standard weight, and extra strong and double extra strong pipe. Sponsored by Manufacturers Standardization Society of the Valve and Fittings Industry.

U. S. Gov., Federal Specification GGG-P-351a; 1944. Pipe-Threads; Taper, American-National. Covers American-National taper pipe-threads, gages for inspection, and methods of gaging the product. Pipe-threads shall be right-hand taper threads unless otherwise specified. Gives detail requirements for taper pipe-threads, tolerances on taper pipe-threads, gages, and table showing dimensions for various size of pipe; and methods of inspection.

U. S. Gov., Joint Army-Navy Specification, JAN-P-3; 1944. Packaging and Packing for Overseas Shipment; Valves and Pipe Fittings; General Specifications for.

U. S. Gov., Navy Dept. Specification 44T2c; 1936. Threads, Standard, Pipe and Pipe-Fitting.

References.—Pipe gaskets, *see* 707.1; fire hose coupling threads, *see* 974.0.

607.1 CAST-IRON PIPE, FITTINGS, AND CONNECTIONS

607.10 General Items

American Petroleum Institute, Div. of Production. Code 26; 1935. Recommended Practice on Form of Agreement and Specifications for Pipe-Line Crossings Under Railroad Tracks.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Laying Cast-Iron Pipe. Gives requirements for material, alinement and grade, excavation, classification, measurement, pipe laying, making joints, special pipe, couplings and fittings, testing, and back-filling.

American Water Works Assn., joint sponsor with American Gas Assn., American Society for Testing Materials, and New England Water Works Assn. American Standards Assn., A21.1-1939. Manual for the Computation of Strength and Thickness of Cast-Iron Pipe With Historical Foreword on Specifications Relating to Cast-Iron Pipe and Fittings. Explanation of the new principles and methods used in computation of standard pipe thicknesses included with specifications for pit cast and other types of cast iron pipe. Part 1 of the manual shows how the methods may be used to compute the necessary thickness of a pipe under known conditions of internal pressure, earth cover and method of laying, for any specified strength of iron.

American Water Works Assn. Joint sponsor with American Gas Assn., American Society for Testing Materials, and New England Water Works Association. Cement Mortar Lining for Cast-Iron Pipe and Fittings; 1939. Approved as American Standard A21.4-1939 by the American Standards Association. Gives requirements for Portland cement, and sand meeting A.S.T.M. specifications, for mixture of mortar, preparation of pipe for lining, method of application and thickness of lining, curing, tests of lining for water absorption, finish; for optional bituminous outside coatings, whitewash for protection from the sun, and bituminous seal coat.

American Water Works Assn. Standard Specifications for Laying Cast-Iron Pipe, 7D.1-1938. Covers inspection, contractor's responsibility for material, handling pipe and accessories, alignment and grade, excavation and preparation of trench, pipe laying, blocking pipe, jointing pipe, setting valves, valve boxes, fittings, blow-offs, setting hydrants, plugging dead ends, anchorage for fittings, hydrostatic tests, backfilling, chlorination of pipe line, and qualifying alternative procedure.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pipe; Cast-Iron, Pressure. Covers definition, use, sizes, general types and characteristics, joints, specifications, trade customs, and ordering.

607.11 Cast-Iron Pipe Culverts, Drains, and Sewers

American Assn. of State Highway Officials, M64-42. Standard Specifications for Cast-Iron Culvert Pipe. Gives scope, classes, type of pipe, material, casting, coating, chemical composition, strength requirements, number of tests, test specimens, testing of specimens, retests, diameter, length, dimensions and weight, waiver of strength tests, workmanship and finish, weighing, marking, inspection, rejection, and testing.

American Assn. of State Highway Officials, T33-42. Standard Methods of Testing Culvert Pipe, Sewer Pipe, and Drain Tile. Covers tests for concrete pipe, cast-iron pipe, clay pipe and drain pipe. Gives three-edge bearing method, sand-bearing method, absorption test, freezing and thawing test for drain tile, and test for resistance to action of acids for clay pipe.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Cast-Iron Culvert Pipe.

American Society of Mechanical Engineers and American Public Health Assn., sponsors. American Standards Assn., A 40.5-1943. Threaded Cast-Iron Pipe for Drainage, Vent, and Waste Services. Covers two types—(A) with external threads on both ends, and (B) with external threads on one end and with internal threaded drainage hubs on the other. Gives size, marking, chemical and physical properties, transverse test requirements, lengths, threading, tolerances, hydrostatic tests, coating, and dimensions of pipe and drainage hubs.

American Society of Sanitary Engineering and American Society of Mechanical Engineers, sponsors. American Standards Assn., A40.1-1935. Cast Iron Soil Pipe and Fittings. Covers extra heavy grade of soil pipe, hub and spigot type, coated or uncoated. Required thicknesses of walls and parts and permissible variation, design of hub and spigot ends, standard weights and dimensions for pipe, bends, sweeps, Y branches, T branches, vent branches, offsets, hubs, reducers, increasers, S traps, running traps, vent and cleanout tappings, ferrules, brass plugs, and tapping bosses.

American Society for Testing Materials, A 74-42; 1942. Cast-Iron Soil Pipe and Fittings. For pipe with hub and spigot ends, or hub ends only, hubs provided with lead grooves, and spigots with beads. Requirements for quality of iron, chemical composition, transverse strength, tensile strength, hydrostatic test, coating, workmanship, and inspection.

American Society for Testing Materials, A 142-38; 1938. American Standards Assn., G26.1-1942. Cast-Iron Culvert Pipe. Includes standard, heavy, and extra-heavy culvert pipe; types of pipe, materials, casting, coating, chemical composition, strength requirements, method of test and test specimen, dimensions, and weight.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention 22.70; 1940. Detailed Specifications for Laying Fire Mains. Includes requirements for cast iron pipe, asbestos-cement pipe, pipe linings, fittings, suction pipe, protection, excavation and preparation, foundations, pipe laying, blocking, and jointing, valves, indicator posts and cast iron fittings, plugging dead ends, anchorage of tees, plugs, and bends, hydrostatic tests, backfilling, and special type pipe. Factory Mutual Bulletin of Loss Prevention 22.71; 1940. Anchoring Fire Mains. Gives diagrams of various methods of anchoring conditions.

U. S. Gov., Federal Specification WW-P-356; 1936. Pipe, Cast-Iron; Drainage, Vent, and Waste (Threaded). Covers two types—(A) with external threads on both ends, and (B) with external threads on one end and with internal threads on the other; and sizes from 1 1/4 to 8 in. Gives requirements for minimum load and deflection for sizes 3 in. and smaller, gaging, tolerances on straightness, dimensions, and weights; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Cast-Iron Culvert Pipe.

References.—Methods of testing, general requirements for metals, *see* 600.1; installation rules for pipe, *see* 607.0, 607.10; other specifications for cast iron, *see* 611.11.

607.12 Cast-Iron Gas and Water Pipe

American Society for Testing Materials, A 44-41; 1941. American Standards Assn. A21.2-1939. Cast-Iron Pit-Cast Pipe for Water or Other Liquids. For pipe cast vertically with dry sand molds and cores, made with bell and spigot ends, plain ends, or as agreed. Requirements for casting of pipe, quality of iron, foundry records, marking, standard dimensions, tolerances, hydrostatic test, weighing, linings and exterior coatings, Talbot strip and ring tests, etc.

American Water Works Assn. Cast Iron Water Pipe and Special Castings, 1908. Covers hub and spigot jointed pipe for 8 classes of pressure service, allowable variations in thickness and weight, marking, quality of iron, test specimen and strength requirements, coal-tar coating, hydrostatic test, and tables of dimensions and weights for standard pipe and special castings as curves, branches, Y's, reducers, caps, and plugs.

American Water Works Assn., joint sponsor with American Gas Association, American Society for Testing Materials, and New England Water Works Assn. Cast Iron Pit Cast Pipe for Water or Other Liquids, 1939. Approved as American Standard A21.2-1939 by the American Standards Assn. For pipe cast vertically with dry sand molds and cores, with bell and spigot ends, plain ends, or otherwise; requirements for quality of iron, castings, marking, tolerances, hydrostatic test, coatings of cement mortar for linings, coal-tar dip, or bituminous enamel, test bars and strength requirements, Talbot strip tests and ring tests, and tables of dimensions.

U. S. Gov., Federal Specification WW-P-421; 1931. Amendment 3; 1940. Pipe; Water, Cast-Iron (Bell and Spigot, and Bolted-Joint). Covers 5 types—(I) centrifugally cast in metal contact mold, (II) centrifugally cast in sand lined molds, (III) horizontally cast in green sand molds, (IV) cast in sand molds, (V) vertically cast in dry sand molds. Gives physical requirements, dimensions, tolerances, and weights; methods of sampling, inspection, and tests; and requirements for packing and marking of shipments. Emergency Alternate Federal Specification E-WW-P-421; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for dimensions, weights, lengths, and pressures of the several classes.

References.—Methods of testing, general requirements for metals, *see* 600.1; installation of pipe, *see* 607.0, 607.10; other specifications for cast iron, *see* 611.11.

607.13 Cast-Iron Pipe for Railings and Poles

607.14 Cast-Iron Pipe Fittings and Connections

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B16a-1939. Cast-Iron Pipe Flanges and Flanged Fittings, Class 125. Specifications on materials, requirements for dimensions and tolerances and theoretical weights.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of Valve and Fittings Industry. American Standards Assn., B16b-1944, B16b1-1931, and B16b2-1931. Cast-Iron Pipe Flanges and Flanged Fittings. Serial B16b-1944 for fittings, class 250. Serial B16b1-1931 for fittings rated at 800-lb. hydraulic pressure. Serial B16b2-1931 for fittings rated at 25-lb. steam pressure. Requirements on chemical composition of cast-iron, standard dimensions and thickness of metal for flanges, elbows, tees, etc., dimensions of drilling templates for flanges, theoretical weights. Covers sizes up to 30-in. diameter for the 250-lb. steam pressure class, sizes up to 12-in. diameter for the 800-lb. hydraulic pressure class, and sizes up to 72 in. for the 25-lb. steam pressure class. Requirements on raised faces, number, dimensions, and spacing of bolt holes, sizes of bolts.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of Valve and Fittings Industry. American Standards Assn., B16d-1941. Cast-Iron Screwed Fittings. For steam pressures of 125 and 250 lb. Tables of dimensions of fittings, including center-to-end dimension and inspection limits for this dimension.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B 16.12-1942. Cast-Iron Screwed Drainage Fittings. Marking, materials, tolerance, threading, ribs, coatings are included in this Standard's recommendations. Also given are two tables of inspection limits, nine tables showing dimensions, and a table of dimensions of welded and seamless steel pipe.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B 16.14-1943. Ferrous plugs, Bushings, Locknuts, and Caps with Pipe Threads. Covers pressure ratings, size, marking, material, metal thickness tolerance, and threading; and gives illustrative drawings and tables showing dimensions for plugs, pipe bushings, locknuts, and caps.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of Valve and Fittings Industry. American Standards Assn., B 16g-1929. Cast-Iron Long Turn Sprinkler Fittings (Screwed and Flanged). For maximum hydraulic working pressures of 150 and 250 lb. per square inch. Designates pressure ratings, size, types, material, facings, bolting, metal thickness, reducing fittings, threading, fitting dimensions, etc.

American Society for Testing Materials, A 74-42; 1942. Cast-Iron Soil Pipe and Fittings. For pipe with hub and spigot ends, or hub ends only, hubs provided with lead grooves, and spigots with beads. Requirements for quality of iron, chemical composition, transverse strength, tensile strength, hydrostatic test, coating, workmanship, and inspection.

American Society for Testing Materials, A 126-42; 1942. Gray Iron Castings for Valves, Flanges, and Pipe Fittings. Covers regular, higher-strength gray or semisteels, and high-test regular or alloy composition. Requirements for chemical composition, tensile properties, transverse test, mold, test specimen, etc.

American Standards Assn., B 16a 1-1943. Pressure ratings for Cast-Iron Pipe Flanges and Flanged Fittings—Class 125 (American War Standard). A revision of paragraph 1, "pressure rating," and paragraph 3, "marking," on page 3 of American Standard B 16a-1939, published by the American Society of Mechanical Engineers and sponsored by the Heating, Piping, and Air Conditioning Contractors National Assn. and the Manufacturers' Standardization Society of the Valve and Fittings Industry.

Manufacturers' Standardization Society of the Valve and Fittings Industry. Pipe Bushings Standard (Cast Iron and Malleable Iron); SP-16, 1937. Amendments 1939 and 1940. Includes dimensional drawings of standard outside and inside hexagon bushings, face bushings from 1/4 to by 1/8 to 12 by 6 in. for pattern sizes only.

Manufacturers' Standardization Society of the Valve and Fittings Industry. Locknut Standard (Cast Iron and Malleable Iron), SP-17; 1937. Covers threaded hexagonal locknuts for piping 1/8 to 3 1/2 in. and hexagonal or octagonal 4-in. or larger sizes, dimensional drawings of standard sizes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Valves and Fittings. Covers definition, classification, and standards of the industry.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts and Fittings. SAE Recommended Practice, Crankcase Drain Plugs. Revised, 1932. Gives drawing with table of dimensions for sizes 1/2, 3/4, and 7/8 in. in diameter.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R185-42; 1942. Pipe Fittings (grey cast iron, malleable iron, and brass or bronze). This recommendation covers the reduction of stock varieties to 35 percent of their former number. Sponsored by the Pipe Fittings Manufacturers Assn.

U. S. Gov., Federal Specification WW-F-406a; 1941. Amendment 1; 1943. Flange-Dimensions, Standard; Classes 125 and 250 Cast Iron Flanges; Classes 150, 250, and 300 Bronze Flanges; (for Land Use). Covers standard dimensions for flanges and includes flanges integral with the pipe, pipe-fittings, and valves; companion flanges; and blind flanges. Gives requirements for class and description, sizes (cast iron and bronze), marking, materials, threads, brazing hubs, silver brazing alloy, and details for each class including facing and dimensions; method of inspection; and packing of shipments.

U. S. Gov., Federal Specification WW-P-401; 1935. Amendment 1; 1937. Pipe and Pipe-Fittings; Soil, Cast-Iron. Covers a single grade which is known as "extra heavy," 2 in. to 15 in., in 5-ft. lengths. Gives permissible variations in laying lengths, dimensions of hubs and spigots, weights, and physical and chemical requirements, methods of inspection and tests; and requirements for packing and marking of shipments. Emergency Alternate Federal Specification E-WW-P-401; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) gave requirements for "Victory" class soil pipe and for standard of medium fittings as to markings, weights, and dimensions.

U. S. Gov., Federal Specification WW-P-491; 1938. Pipe-Fittings; Cast-Iron, Drainage. Covers couplings, crosses, elbows, increasers, offset, tees, traps, tucker connections, Y-branches 90° and 45°; black (uncoated), black—(japan) coated, and zinc-coated (galvanized). Gives requirements for dimensions, pitched openings, and water seal; methods of sampling, inspection, and tests; and requirements for packaging, and packing for shipment. Emergency Alternate Federal Specification E-WW-P-491; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) eliminated basin crosses, offsets, and half S traps from table of fittings and changes dimensions of fittings.

U. S. Gov., Federal Specification WW-P-501a; 1939. Pipe-Fittings; Cast-Iron (Threaded). Covers two types—(A) 125-lb., and (B) 250-lb., black and zinc-coated; caps, couplings, crosses, elbows, pipe plugs, return bends, and tees. Gives tolerances, dimensions, methods of inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-501a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed dimensions of fittings.

U. S. Gov., Navy Dept. Specification 45F3f; 1940. Fittings; Pipe, Iron (Cast), Threaded.

References:—Methods of testing, general requirements for metals, *see* 600.1; installation of pipe, *see* 607.0, 607.10; threading standards, *see* 607.0; other specifications for cast iron, *see* 611.11; other cast-iron fittings, *see* 607.11.

607.2 MALLEABLE IRON PIPE, FITTINGS, AND CONNECTIONS

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B-16c-1939. General Requirements, materials, thickness tolerance, threading, and dimensions of elbows, tees, crosses, elbows, branches, street tees, couplings, caps, return bends, lock nuts, pipe bushings, pipe plugs, and an appendix containing table of dimensions of welded and seamless steel pipe.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B 16.14-1943. Ferrous Plugs, Bushings, Locknuts, and Caps With Pipe Threads. Covers pressure ratings, size, marking, material, metal thickness, tolerance, and threading; and gives illustrative drawings and tables showing dimensions for plugs, pipe bushings, locknuts, and caps.

American Society for Testing Materials, A 277-44 T. Tentative Specification for Malleable Iron Flanges, Pipe Fittings, and Valve Parts. Gives scope, certification, process, manufacture, manufacture control and records, tests, and marking.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Pipe Unions. Standard. Dimensional drawing of design, with table of standard sizes covering 1/8-in. to 4-in. malleable pipe unions.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Screwed Pipe Fittings for 300-Lb. Pressure. Recommended Practice. Covers dimensional diagrams and tables for reducing elbows, reducing tees, tees and crosses, union tees, air pump union reducers, caps, couplings, and street elbows.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Steel Welding Neck Flanges. Recommended Practice. For maximum steam service pressure, in various types, in pounds per square inch, from 150 to 500 degrees F., 300, 400, 600, 900, and 1,500 at 750 degrees F. Diagrams and tables of dimensions, for 1 to 24-in. pipe size, except higher pressures are limited to smaller pipe ranges.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Unions and Pipe Fittings, 300-Lb. Pressure, M-404-42; 1942. Malleable iron or steel fittings for use on locomotives, requirements as to manufacture, tensile strength of 1/8 to 3-in. sizes, method of test, workmanship, finish, and marking.

Manufacturers Standardization Society of the Valve and Fittings Industry. Pipe Bushings Standard (Cast Iron and Malleable Iron), SP-16; 1937. Amendments, 1939 and 1940. Includes dimensional drawings of standard outside and inside hexagon bushings, face bushings from 1/4 x 1/8 to 12 x 6 in. for pattern sizes only.

Manufacturers Standardization Society of the Valve and Fittings Industry. Locknut Standard (Cast Iron and Malleable Iron), SP-17; 1937. Covers threaded hexagonal locknuts for piping 1/8 to 3 1/2 in., and hexagonal or octagonal 4-in. or larger sizes, dimensional drawings of standard sizes.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Hazardous Liquid Pipe Unions, 1937. For use with standard-weight pipe, to convey gasoline, kerosene, fuel oil, etc. So-called 250-lb. unions, metal-to-metal seat type malleable iron or steel, galvanized, with brass or bronze ring seat.

Unions may have brass or bronze pipe ends where equivalent strength is provided. Includes tensile and hydrostatic tests for 1/4 to 3-in. unions, and dimensional drawing.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R185-42; 1942. Pipe Fittings (grey cast iron, malleable iron and brass or bronze). This recommendation covers the reduction of stock varieties to 35 percent of their former number. Sponsored by the Pipe Fittings Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS7-29; 1929. Standard Weight Malleable Iron or Steel Screwed Unions. This standard covers malleable iron or steel unions for use with standard-weight pipe, furnished in black, brass seated; galvanized, brass seated types.

U. S. Gov., Federal Specification WW-P-404; 1944. Pipe; Steel and Ferrous Alloy for Bending, Flanging, etc. (Iron-Pipe Size). Covers black and coated pipe in three types—I, steel (carbon, welded and seamless); II, steel (copper-bearing, welded and seamless); III, open-hearth iron (copper molybdenum, welded); and three classes—A, standard weight; B, extra strong; and C, double extra strong. Gives requirements for material and workmanship, marking, lengths, diameter and thickness, weight tolerances, black pipe, zinc-coated pipe, pipe ends and couplings, pipe threads, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-P-406; 1944. Pipe; Steel and Ferrous Alloy for Ordinary Uses (Iron-Pipe Size). Covers black, coated, or lined pipe in three types—I, steel (carbon, welded and seamless); II, steel (copper-bearing, welded and seamless); III, open-hearth iron (copper-molybdenum, welded); and three classes—A, standard weight; B, extra strong; and C, double extra strong. Gives requirements for material and workmanship, marking, lengths, diameter and thickness, weight tolerances, black pipe, zinc-coated pipe, cement lined pipe, pipe ends and couplings, pipe threads, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-P-521a; 1939. Pipe-Fittings; Malleable-Iron (Threaded), 150-Pound. Covers two classes—black and zinc-coated; bushings, caps, couplings, crosses, elbows, return bends, tees, and Y-branches. Gives requirements for tolerances and dimensions; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-521a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed sizes of fittings.

U. S. Gov., Federal Specification WW-U-531; 1932. Unions; Malleable Iron or Steel, 250-Pound. Covers two threaded types—(A) black, brass seated; and (B) zinc-coated (galvanized), brass seated. Gives requirements for tensile strength and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-U-531; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for dimensions and packaging.

U. S. Gov., Federal Specification WW-U-536; 1932. Unions; Malleable Iron or Steel, 300-Pound. Covers four types—(XA) black, brass or copper seated; (XB) galvanized, brass or copper seated; (XC) black, all iron or steel; and (XD) galvanized, all iron or steel. Gives requirements for dimensions and tensile strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-U-536; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for dimensions, ultimate loads, marking, and packaging.

U. S. Gov., Navy Dept. Specification 45B5d; 1942. Bushings; Pipe.

U. S. Gov., Navy Dept. Specification 45F5d; 1940. Fittings; Pipe, Iron, (Malleable), Threaded, 150-Pound.

U. S. Gov., Navy Dept. Specification 45F6b; 1934. Flanges; Iron (Malleable).

U. S. Gov., Navy Dept. Specification 45U3d; 1935. Unions; Iron (Malleable) or Steel, 250-Pound.

U. S. Gov., Navy Dept. Specification 45U6a; 1935. Unions; Iron (Malleable) or Steel, 300-Pound.

References.—Methods of testing, general requirements for metals, *see* 600.1; zinc coatings and tests, *see* 600.3; installation, identification, and care of piping, *see* 607.0; standard threading of pipe, *see* 607.0; other malleable iron castings, *see* 611.2.

607.3 WROUGHT-IRON PIPE, FITTINGS, AND CONNECTIONS

Air Conditioning and Refrigerating Machinery Assn., Inc., 4.0; 1941. Miscellaneous Ammonia Standards. Includes—(4.3) Steel and Wrought Iron Pipe. Recommendations for minimum centers for bending pipe, painting of coils, spacing of hangers, protection of exposed threads, treatment of pipe joints, welding flanges to pipe, test pressures, and cleaning of pipe.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Wrought Iron Pipe. Include rules for inspection and tests.

American Petroleum Institute, Division of Production. Standard 5-A, 1944. Specification for Casing, Drill Pipe, and Tubing. This specification covers chemical and physical properties and processes of manufacture of casing, drill pipe, and tubing, with dimensions on diameters, thicknesses, lengths, threads, etc., and master gages. Covers material, manufacture, chemical properties and tests, physical properties and tests, dimensions, weights, and lengths, threads, couplings, marking, inspection and rejection, tables, gaging practice, gages, and appendices.

American Petroleum Institute, Div. of Production. Standard 5-L; 1944. Specification for Line Pipe. This specification covers chemical and physical properties and processes of manufacture of line pipe, with dimensions on diameters, thicknesses, lengths, threads, etc., and master gages. Covers material, manufacture, chemical properties and tests, physical properties and tests, dimensions, weights, and lengths, threads, couplings, marking, inspection and rejection, tables, gaging practice, gages, and appendices.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for pipe railing.

American Society of Mechanical Engineers. American Standards Assn., B 36.10-1939. Wrought-Iron and Wrought-Steel Pipe. Standard consists of ten weight and thickness schedules of which lightest wall is schedule 10 and the heaviest is schedule 160, although schedule 80 is heaviest wall so far contemplated for wrought iron. Thicknesses suitable for welding are given and provisions have been made for suitable thicknesses in anticipation of development of new processes and materials for manufacturing and erecting piping.

American Society for Testing Materials, A 72-39; 1939. A.S.M.E. Boiler Construction Code Specification, SA-72. American Assn. of State Highway Officials, M101-39. American Standards Assn., B36.2-1939. Welded Wrought-Iron Pipe. Covers standard weight, extra strong, and double extra strong pipe. Tension, hydrostatic, fracture, and bend test requirements, standard weights and lengths, and permissible variations in weight.

American Welding Society. Rules for Fusion Welding, Steam, Oil, or Air Piping in Marine Construction, 1938. These rules apply to piping for working pressures in excess of 100 lb. per square inch. They do not apply to piping for water and oil at normal temperatures. Includes qualification of welding process, rules for qualification of welding operators, design of piping, layout and dimensions of piping, stress relieving of plain carbon steels, tests, and stamping of work.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention 22.70; 1940. Detailed Specifications for Laying Fire Mains. Includes requirements for cast iron pipe, asbestos-cement pipe, pipe linings, fittings, suction pipe, protection, excavation and preparation, foundations, pipe laying, blocking, and jointing, valves, indicator posts and cast iron fittings, plugging dead ends, anchorage of tees, plugs, and bends, hydrostatic tests, backfilling, and special type pipe. Factory Mutual Bulletin of Loss Prevention 22.71; 1940. Anchoring Fire Mains. Gives diagrams of various methods of anchoring conditions.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, Specification 123-39; 1939. One-Inch Welded Wrought Iron Pipe. For units mechanically operated in railway signal service. Composition of iron, physical properties, special thread details, galvanizing, etc.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Dimensions and Threads of Wrought Pipe. Standard. Includes wrought iron and steel pipe, standard section to be Briggs Standard table of dimensions for pipe from 1/8-in. to 12-in. nominal inside diameter, actual sizes, length of perfect screw and number of threads per inch.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Pipe Unions of the Nut and Nipple Type for Locomotives—300-Lbs. Pressure. Recommended Practice. Dimensional drawings of elbows and tees, for screwed fittings, 1/4-in. to 3-in. sizes, details for tail piece, union ring, and thread piece.

Assn. of American Railroads. Operations and maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Welded Wrought Iron Pipe, M-360-38; 1938. Covers three weights of black and galvanized pipe, for coiling, bending, flanging and other special purposes. Butt welded pipe is not intended for flanging or recommended for coiling in sizes 1 1/4 in. or over. Galvanizing tested by standard of A.S.T.M., A-120. Tension, bend, and hydrostatic pressure tests, standard weights, and sizes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pipe; Wrought Iron. Covers definition, types and sizes, mill standards, ordering wrought iron pipe, and trade customs.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume II, 1944. Iron; Wrought. Covers definition, derivation, constants, uses, forms, and substitutes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS5-40; 1940. Pipe Nipples; Brass, Copper, Steel, and Wrought-Iron. This standard covers steel, ferrous-alloy, and wrought-iron nipples, black- and zinc-coated (hot dip galvanized), in iron-pipe sizes from 1/8 to 12 in., of standard length; and brass and copper nipples in standard sizes 1/8 to 6 in. Gives tables showing pipe sizes and various lengths, packaging, and labeling. Initiated by manufacturers, now represented by National Assn. of Pipe Nipples Manufacturers.

U. S. Gov., Federal Specification WW-N-351; 1930. Amendment 1; 1936. Nipples, Pipe; Brass, Steel, and Wrought Iron. Covers coated and uncoated nipples, in iron pipe sizes from 1/8 to 12 in., of standard lengths; brass nipples in iron pipe sizes from 1/8 to 6 in.; and three types—(A) standard weight, (B) extra strong, and (C) double extra strong. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-P-441a; 1939. Pipe; Wrought-Iron, Welded, Black, and Zinc-Coated. Covers three classes—(A) standard weight, (B) extra strong, and (C) double extra strong. Gives chemical and physical requirements; methods of sampling, inspection, and tests; and requirements for packing, packaging, and marking for shipment.

U. S. Gov., Navy Dept. Specification 44P11k; 1945. Pipe; Iron, Wrought.

U. S. Gov., Navy Dept. Specification 45B5d; 1942. Bushings; Pipe.

U. S. Gov., Navy Dept. Specification 45N3; 1941. Nipples, Pipe; Brass, Steel, and Wrought-iron.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for welded wrought-iron pipe—material, chemical composition, tensile properties, tests, test specimens, permissible variations and dimensions, inspection and rejection, and marking. In substantial agreement with American Society for Testing Materials Standard Specification A72.

References.—Methods of testing, general requirements for metals, *see* 600.1; zinc coatings and tests, *see* 600.3; standard pipe sizes, *see* 607.0; installation, identification, care of piping, *see* 607.0; iron-boiler tubes, *see* 703.2; wrought-iron conduit for electric wiring, *see* 715.11.

607.4 STEEL PIPE, FITTINGS, AND CONNECTIONS

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 102; 1942. Tube Control. 3/8 O. D., and 1/2 O. D., Steel. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Air Conditioning and Refrigerating Machinery Assn., Inc., 4.0; 1941. Miscellaneous Ammonia Standards. Steel and Wrought Iron Pipe. Recommendations for minimum centers for bending pipe, painting of coils, spacing of hangers, protection of exposed threads, treatment of pipe joints, welding flanges to pipe, test pressures, and cleaning of pipe.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Steel Pipe. Include rules for inspection and testing.

American Iron and Steel Institute. Steel Products Manual, 1944. Specifications for English Standard Gas and Steam Pipe. For welded and seamless, threaded and coupled, and plain end pipe, of nominal diameters from 1/8 in. to 6 in. inclusive, gas and steam pipe. Pipe made to this specification is interchangeable with pipe made to British Standards 789-1938. Gives definitions, designation of coupling, process of manufacture, quality of material, dimensions of pipe and couplings, joints, lengths, galvanizing, tolerances, hydrostatic test, tests on finished pipe, retests, workmanship, marking for indication of quality, packing for export, and table showing nominal size, dimensions, and weight of English gas and steam pipe.

American Iron and Steel Institute. Steel Products Manual, 1943. Standard Machining Allowances for Seamless Steel Tubing for Aircraft Shock Struts and Landing Gear. Mechanical tubing is produced with either hot finish or cold-drawn finish. Such tubing is machined true to the outside diameter of the tube or machined true to the inside diameter of the tube. Gives machining allowances, examples of calculation, and camber allowance.

American Iron and Steel Institute. Steel Products Manual, Section 18, 1938. Revised, 1944. Steel Tubular Products. Gives definitions, classifications and manufacturing practices; stainless tubular products; tables of dimensions, weights, and hydrostatic test pressures; basic threading data; methods of calculating weights of couplings and upsets; standard machining allowances for seaming tubing for aircraft stock struts and landing gear; and standard method of packing and loading steel tubular products.

American Petroleum Institute, Div. of Production. Standard 5-A; 1944. Specification for Casing, Drill Pipe, and Tubing. This specification covers chemical and physical properties and processes of manufacture of casing, drill pipe, and tubing, with dimensions on diameters, thicknesses, lengths, threads, etc., and master gauges. Covers material, manufacture, chemical properties and tests, physical properties and tests, dimensions, weights, and lengths, threads, couplings, marking, inspection and rejection, tables, gaging practice, gages, and appendices.

American Petroleum Institute, Div. of Production. Standard 5-L; 1944. Specification for Line Pipe. This specification covers chemical and physical properties and processes of manufacture of line pipe, with dimensions on diameters, thicknesses, lengths, threads, etc., and master gages. Covers material, manufacture, chemical properties and tests, physical properties and tests, dimensions, weights, and lengths, threads, coupling, marking, inspection and rejection, tables, gaging practice, gages, and appendices.

American Society of Mechanical Engineers. Boiler Construction Code, 1940. Specifications for Carbon-Steel Casings Suitable for Fusion Welding for Service at Temperatures up to 850 F. (S-56). Identical with American Society for Testing Materials Specification A216.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B 16e-1939. Steel Pipe Flanges and Flanged Fittings. This Standard contains dimensions of—(1) the 150, 300, 400, 600, 900, 1,500, and 2,500-lb. flanges; (2) welding neck flanges and fittings for all pressures; (3) slip-on welding flanges for 150 and 300-lb. pressures; (4) for blind flanges for all pressures; and (5) for ring joints. The standard gives details of welding level for all welding neck flanges, wall thicknesses of pipe, and bolt lengths for flanges. There are also dimensions of reducing screwed flanges for pressures of 150 to 2,500-lb. temperature-pressure ratings for carbon steel, carbon-molybdenum, and equivalent alloy steels. Other specifications cover size, marking, materials, and their physical and chemical requirements.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of Valve and Fittings Industry. American Standards Assn., B16e2-1936. Pipe Plugs of Cast-Iron, Malleable Iron, Cast Steel, or Forged Steel. For use in connection with fittings covered by American Standard 125-lb. and 250-lb. Cast Iron Screwed Fittings and American Standard 150-lb. Malleable Iron Screwed Fittings.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B16.9-1940. Steel Butt-Welding Fittings. Covers over-all dimensions, tolerances, and marking for wrought and cast carbon- and alloy-steel welding fittings, with appendix table of dimensions of welded and seamless steel pipe.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B 16.14 1943. Ferrous Plugs, Bushings, Locknuts, and Caps With Pipe Threads. Covers pressure ratings, size, marking, material, metal thickness tolerance, and threading; and gives illustrative drawings and tables showing dimensions for plugs, pipe bushings, locknuts, and caps.

American Society of Mechanical Engineers. American Standards Assn., B 36.10-1939. Wrought-Iron and Wrought-Steel Pipe. Standard consists of ten weight and thickness schedules of which lightest wall is schedule 10 and the heaviest is schedule 160, although schedule 80 is heaviest wall so far contemplated for wrought iron. Thicknesses suitable for welding are given and provisions have been made for suitable thicknesses in anticipation of development of new processes and materials for manufacturing and erecting piping.

American Society for Testing Materials, A 53-44; 1944. A.S.M.E. Boiler Construction Code Specification, SA-53. American Standards Assn., B36.1; 1944. Welded and Seamless Steel Pipe. Covers black and hot-dipped-galvanized furnace welded and seamless steel pipe. Gives chemical composition, check analysis, tensile properties, bending properties, flattening test, hydrostatic test, test specimens, number of tests, retests, standard weights, permissible variations in weight and dimensions, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 53; 1943, affected section 1, scope, table I tensile requirements; section 7, flattening test; and section 8, hydrostatic test.

American Society for Testing Materials, A 95-44; 1944. A.S.M.E. Boiler Construction Code Specification, SA-95. American Standards Assn., G17.1; 1944. Carbon-Steel Castings and Valves, Flanges, and Fittings for High-Temperature Service. For pressure containing parts for high temperature service. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, hydrostatic tests, magnetic particle testing, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 95; 1944, affected section 5, chemical composition; section 8, tensile properties; and section 10, hydrostatic tests.

American Society for Testing Materials, A 105-40; 1940. A.S.M.E. Boiler Construction Code Specification, SA-105. American Standards Assn., G17.3-1940. Forged or Rolled Steel Pipe Flanges, Forged Fittings, and Values and Parts for High-Temperature Service. Includes two grades of material based on tensile strength; grades requirements for manufacture, heat treatment, chemical composition, ladle analysis, tensile properties, test specimen, finish, and inspection.

American Society for Testing Materials, A 106-44T; 1944. A.S.M.E. Boiler Construction Code Specification, SA-106. Tentative Specifications for Lap-Welded and Seamless Steel Pipe for High-Temperature Service. Covers pipe suitable for bending, flanging, and similar forming operations for steam service pressures of 400 psi. and over, the metal temperatures up to 850 F., or other applications where a superior grade of pipe is required. Gives requirements for process, chemical composition, check analysis, tensile and bending properties, test specimens, tests, dimensions, permissible variations in weight and dimensions, lengths, ends, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 120-44; 1944. American Standards Assn., G8.7; 1944. Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses. For ordinary uses in steam, water, gas, and air lines, but not for close coiling, bending, or high temperature service. Gives requirements for galvanized pipe, hydrostatic test, weight of coating, weight of coating test, test specimens, number of tests, retests, standard weights, permissible variations in weight and dimensions, lengths, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 120; 1942, affected section 1, scope; and section 14, finish.

American Society for Testing Materials, A 134-42; 1942. American Standards Assn., B36.4; 1942. Electric-Fusion-Welded Steel Pipe, Sizes 30 In. and Over. Covers straight-seam or spiral-seam pipe with wall thickness up to 3/4 in. for conveying liquid, gas, or vapor at temperatures below 450° F. Gives requirements for materials, manufacture, tensile and bending properties, hydrostatic test, test specimen, permissible variations in weights and dimensions, finish, and inspection. A.S.T.M. Emergency Alternate Provision, EA-A 134; 1942, affected section 2, material; and section 13, protective coating.

American Society for Testing Materials, A 135-44; 1944. A.S.M.E. Boiler Construction Code Specification, SA-135. American Standards Assn., B36.5; 1944. Electric-Resistance-Welded Steel Pipe. Covers two grades of pipe under 30 in. in diameter for conveying liquid, gas, or vapor. Gives requirements for chemical composition, ladle analysis, check analysis, tensile properties, flattening and hydrostatic tests, test specimens, number of tests, retests, permissible variations in weight and dimensions, lengths, workmanship, finish, marking, protective coating, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 135; 1942, affected section 17, protective coating.

American Society for Testing Materials, A 139-42; 1942. American Standards Assn., B36.9; 1942. Electric-Fusion-Welded Steel Pipe (sizes 8 in. to but not including 30 in.). Covers two grades of electric-fusion-welded straight-seam or spiral-seam pipe with wall thicknesses up to 5/8 in. inclusive. The pipe is intended for conveying liquid, gas, or vapor at temperatures below 450° F.; and only grade A is adapted for flanging and bending. A.S.T.M. Emergency Alternate Provision, EA-A 139a; 1943, affected section 1, size; section 5, chemical analysis; section 6, tensile properties; section 10, number of tests; section 12, weight; section 14, workmanship; and section 17, protective coating.

American Society for Testing Materials, A 155-42; 1942. American Standards Assn., B36.11-1942. Electric-Fusion-Welded Steel Pipe for High-Temperature and High-Pressure Service. Cover electric-fusion-welded steel pipe 18 in. in outside diameter and over, for high-temperature and high-pressure service. This contemplates, in particular, pipe subjected to pressures above 250 psi. and temperatures from 450 to 850° F., or at the discretion of the designing engineer, higher temperatures with appropriate working stresses may be used. This also contemplates pipe carrying liquids materially above their boiling temperature at atmospheric pressure, as well as all liquids and gages of a lethal nature, at any pressure or temperature. Recommended work-stresses for pipe made in accordance with these specifications correspond to the S-values given in section 1 of the Code for Pressure Piping, ASA B31.1, prepared by Sectional Committee B 31 on Code for Pressure Piping, functioning under the procedure of the American Standards Assn., and also as given in paragraph P23 of the A.S.M.E. Boiler Construction Code. Pipe ordered under these specifications shall be suitable for bending, flanging, corrugating, and similar forming operations. Supplementary requirements of an optional nature are provided for pipe intended for use in central stations having steam service pressures of 400 psi. and over and metal temperatures up to 850° F., or other applications where a superior grade of pipe is required.

American Society for Testing Materials, A 157-44; 1944. A.S.M.E. Boiler Construction Code Specification, SA-157. American Standards Assn., G36.1; 1944. Alloy-Steel Castings for Valves, Flanges, and Fittings for Service at Temperatures from 750 to 1,100° F. Includes nine ferritic and two austenitic grades, selection dependent on design and service. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, number of tests, retests, tensile and bending properties, hydrostatic tests, magnetic particle testing, test specimens, radiographic or destruction tests, workmanship, marking, finish, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 157; 1944, affected section 10, hydrostatic tests.

American Society for Testing Materials, A 158-44T; 1944. A.S.M.E. Boiler Construction Code Specification, SA-158. Tentative Specifications for Seamless Alloy-Steel Pipe for Service at Temperatures from 750 to 1,100° F. Includes 8 ferritic and 3 austentic steels. Gives heat treatment, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, flattening test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in weight and dimensions, lengths, ends, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision, EA-158a; 1944, affected section 1, scope; and table 1, chemical requirements.

American Society for Testing Materials, A 161-44; 1944. Seamless Low-Carbon and Carbon-Molybdenum Steel Still Tubes for Refinery Service. Covers 2 in. and over outside diameter, thicker than No. 5 B.W.G., for use in carrying oil at elevated temperatures and pressures in oil stills. Gives manufacture, chemical composition, check analysis, tensile properties, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision, EA-A 161; 1942, affected section 4, chemical composition.

American Society for Testing Materials, A 181-42; 1942. A.S.M.E. Boiler Construction Code Specification, SA-181. American Standards Assn., G46.1-1942. Forged or Rolled Steel Pipe Flanges for General Service. Covers flanges to be attached to piping or pressure vessels for two classes for general service. Gives requirements as to grain flow, chemical composition, ladle analysis, tensile properties, test specimen, workmanship, finish, and inspection.

American Society for Testing Materials, A 182-44; 1944. A.S.M.E. Boiler Construction Code Specification, SA-182. American Standards Assn., G37.1; 1944. Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for Service at Temperatures from 750 to 1,100° F. Includes seven ferritic and three austenitic steels, selection dependent on design and service. Gives requirements for manufacture, heat treatment, chemical composition, ladle analysis, check analysis, tensile properties, hydrostatic tests, test specimens, number of tests, retests, macroetch tests, workmanship, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 214-44; 1944. A.S.M.E. Boiler Construction Code Specification, SA-214. Electric-Resistance-Welded Steel Heat-Exchanger and Condenser Tubes. For tubes up to 2 in. outside diameter. Gives manufacture, chemical composition, check analysis, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in dimensions, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 214a; 1943, affected section 3, manufacture; section 6, flattening test; section 8, hardness test; and section 9, hydrostatic tests.

American Society for Testing Materials, A 234-44; 1944. Factory-Made Wrought Carbon-Steel and Carbon-Molybdenum-Steel Welding Fittings. For pressure piping, including butt welding or socket-end parts such as elbows, return bends, caps, tees, reducers, etc., but not including cast welding fittings. Gives requirements for material, manufacture, chemical composition, check analysis, heat treatment, tensile properties, hydrostatic tests, retests, workmanship and finish, marking, inspection, and rejection.

American Society for Testing Materials, A 252-44; 1944. Welded and Seamless Steel Pipe Piles. Covers furnace-welded, electric-welded, and seamless steel black pipe piles. Applies only to piles in which the steel section acts as a permanent load-carrying member and is not intended to apply to pipe for general structural purposes. Gives process, tensile properties, test specimens, number of tests, retests, standard weights, permissible variations in weights and dimensions, lengths, ends, finish, marking and inspection.

American Society for Testing Materials, A 253-44; 1944. Welded Alloyed Open-Hearth Iron Pipe. Covers black and galvanized furnace butt-welded and electric-resistance-welded alloyed open-hearth iron pipe. Gives process, chemical composition, check analysis, tensile properties, bending properties, flattening test, hydrostatic test, test specimens, number of tests, retests, standard weights, permissible variations in weights and dimensions, lengths, workmanship, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 254-44; 1944. Copper Brazed Steel Tubing. Covers copper brazed steel tubing 3/16 in. and over in outside diameter, particularly suitable for use in automobile, refrigerator, and stove industries; for fuel lines, brake lines, oil lines, etc. Gives process, manufacture, chemical composition, check analysis, tensile properties, combined flattening and bend tests, flaring tests, bending properties, hardness test, hydrostatic test, soundness of braze, cleanliness, tests, retest, permissible variations, coating, finish, marking, inspection, rejection, and rehearing.

American Standards Ass'n., B 16e 5-1943. Pressure-Temperature Ratings for Steel Pipe Flanges, Flanged Fittings, and Valves (American War Standard). A revision of tables 6 to 11, inclusive, American Standard B 16e-1939, published by the American Society of Mechanical Engineers and sponsored by the Heating, Piping, and Air Conditioning Contractors National Assn. and the Manufacturers' Standardization Society of the Valve and Fittings Industry.

American Transit Assn. Specification for Tubular Steel Poles, D11-39; 1939. These specifications cover material for, and the manufacture of, tubular steel poles for electric line construction. Gives detailed requirements for construction of poles, testing, permissible variations in weight and dimensions, workmanship and finish, and inspection and rejection. This specification has been approved by the American Standards Assn. as American Tentative Standard C13-1926.

American Transit Assn. Recommended Practice for Selection of Poles for Trolley Line Construction, D119-36; 1936. Describes method for selection and use of line poles for overhead construction, and method to be used in selecting proper poles when loading is known.

American Transit Assn. Recommended Specification for Single-Section Tapered Tubular Steel Poles, D125-41; 1941. This specification covers material for, and the manufacture of, single-section, single and double-thickness, tapered tubular steel poles for electric line construction; covering (a) embedded type poles, (b) anchor rod type poles. Covers construction of pole, tests, permissible variations in weight and dimensions, and inspection and rejection.

American Transit Assn. Recommended Specification for High Strength Sectional Tubular Steel Poles, D126-41; 1941. This specification covers material for, and the manufacture of, high strength, sectional tubular steel poles for electric line construction. Covers construction of pole, tests, permissible variations in weight and dimensions, workmanship and finish, and inspection and rejection..

American Water Works Assn. Standard Specifications for Riveted Steel Pipe, 7A.1-1940. Cover the manufacture of pipe, intended for the conveyance of water, which is made from steel plates with riveted seams. The pipe shall be shop fabricated into sections having laying lengths of approximately 30 ft. except where shorter lengths are required for closures, curves, changed in alignment or grade, or to meet special conditions. Each section shall be made up of not more than four courses. In general, longitudinal seams shall be double riveted lap and circular seams single riveted lap. Field joints shall be single riveted lap unless otherwise specified.

American Water Works Assn. Tentative Standard Specifications for Lock-Bar Pipe, 7A.2-1940. Cover the manufacture of lock-bar pipe intended for the conveyance of water which is made from steel plates rolled or formed to a circular cross section, having longitudinal edges planed and upset to a dovetail form which engages in the groove of an "H-shape" steel lock-bar to form the longitudinal joint of the pipe. After assembly of the plates and the lock-bars the latter are closed by cold pressing thus making a tight fit over the dovetail edges of the plates. Pipes are shop fabricated into sections having laying lenghts of approximately 30 ft. except where shorter lengths are required for closure, curves, changes in alignment or grade to meet special conditions. Circumferential field joints are single riveted unless otherwise specified.

American Water Works Assn. Standard Specifications for Electric Fusion Welded Steel Water Pipe of Sizes 30 Inches and Over, 7A.3-1940. Covers straight sections or other special sections which are required for closures, curves, changes in alignment or grade to meet special conditions. Gives requirements for description of pipe, fabrication, tolerances, cleaning, sand blasting, and coating pipe surfaces.

American Water Works Assn. Tentative Revision of Standard Specifications for Steel Water Pipe of Sizes up to but Not Including 30 Inches, 7A.4-TR-1943. Covers steel pipe intended for the conveyance of water, in sizes up to but not including 30 in. in diameter, and in random, double random or specified laying lengths, straight sections, or other special sections which are required for closures, curves, changes in alignment or grade to meet special conditions and with ends prepared for type of joint specified. Gives requirements for description of pipe, fabrication, tolerances, tests, and delivery.

American Welding Society. Rules for Fusion Welding, Steam, Oil, or Air Piping in Marine Construction, 1938. These rules apply to piping for working pressures in excess of 100 lb. per square inch. They do not apply to piping for water and oil at normal temperatures. Includes qualification of welding process, rules for qualification of welding operators, design of piping, layout and dimensions of piping, stress relieving of plain carbon steels, tests, and stamping of work.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention 22.70; 1940. Detailed Specifications for Laying Fire Mains. Includes requirements for cast iron pipe, asbestos-cement pipe, pipe linings, fittings, suction pipe, protection, excavation and preparation, foundations, pipe laying, blocking, and jointing, valves, indicator posts and cast iron fittings, plugging dead ends, anchorage of tees, plugs, and bends, hydrostatic tests, backfilling, and special type pipe. Factory Mutual Bulletin of Loss Prevention 22.71; 1940. Anchoring Fire Mains. Gives also diagrams of various methods of anchoring conditions.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of

Recommended Practice, Specification 122-39; 1939. One-Inch Welded Steel Pipe. For use in mechanically operated units in railway signal service. Gives chemical and physical properties, threads, couplings, plugs, galvanizing, and tests.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1943. Emergency Specification E-M-111-43 modifies AAR Specification M-111-42, Pipe, Furnace Welded, Electric Resistance Welded and Seamless Steel, to conform with A.S.T.M. Specifications A-53-42 and EA-53-43, Welded and Seamless Steel Pipe.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Pipe, Furnace Welded, Electric Resistance Welded and Seamless Steel, M-111-42, 1942. Covers three weights of black and galvanized pipe, coiling, bending, flanging qualities, manufacture, composition and test, pressures, weights, and dimensions.

Formed Steel Tube Institute. Handbook of Welded Steel Tubing, 1943. To give the user a knowledge of the physical, chemical, and metallurgical properties of welded carbon and alloy steel tubing together with commercial tolerance limitations and extensive engineering data. Has sections covering general process, size tolerances, inspection procedure, internal pressures, squares and rectangles, physical properties, weight tables, how to order, length tolerances, fabricating (incl. bending), elements of sections and index.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pipe; Steel. Covers definition, types and size ranges, specifications, sizes and uses, and length standards.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Valves and Fittings. Covers definition, classification, and standards of the industry.

National Board of Fire Underwriters. Petroleum Pipe Lines, No. 38; 1932. Recommended practice for the transportation of crude oil and liquid petroleum products. Does not include lines within refineries, oil fields, or industrial plants. Includes construction of pipe, valves, and fittings; flanged and welded joints, depth of line within cities and extra gage of pipe, railroad crossings, encasement, emergency valves at large rivers, and towns; maintenance and pumping stations.

Society of Automotive Engineers. Aeronautical Material Specification 5050B; 1944. Steel Tubing (Seamless); Low Carbon (Annealed). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections. Similar specifications, Army 57-180, type I, WD 1010; SAE 1010.

Society of Automotive Engineers. Aeronautical Material Specification 5053; 1942. Steel Tubing (Welded); Low-Carbon. Gives requirements for type, composition, grain size, condition, quality, tolerances, tests, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5060A; 1942. Carbon Steel (.13-.18 Carbon). For bars, billets, forgings, tubing, or as ordered. Gives requirements for composition, condition, quality, reports, shipments, identification, and rejections. Similar Specifications: Navy 46 S 32, Class A; SAE 1015.

Society of Automotive Engineers. Aeronautical Material Specification 5075; 1942. Steel Tubing (Seamless); (.22-.28) Carbon. Covers composition, grain size, condition, quality, tolerances, reports, identification, and rejections. Similar to U. S. Gov., Navy Dept., Bureau of Aeronautics Specification AN-WW-T-846, and Society of Automotive Engineers Specification 1025.

Society of Automotive Engineers. Aeronautical Material Specification 5077; 1942. Steel Tubing (Welded); (.22-.28) Carbon. Gives requirements for type, composition, grain size, condition, quality, tolerances, tests, reports, identification, and rejections. Similar to U. S. Gov., Army-Navy Aeronautical Specification AN-T-4 and Society of Automotive Engineers Specification 1025.

Society of Automotive Engineers. Aeronautical Material Specification 5082; 1944. Steel Tubing (Seamless); (.32-.38) Carbon. Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections. Similar specifications, SAE 1035.

Society of Automotive Engineers. 1944 Handbook Section 1—Aeronautical Parts, Materials and Codes. S.A.E. Recommended Practice for Aircraft Steel Streamline Structural Tubing. Adopted, 1931. Diagram with table of streamline dimensions for sizes developed from round tubing 2 to 5 in. in diameter; table of progressive section width diameters; table of round tubing sizes available in aluminum alloy, carbon steel, and alloy steel; and tables of round tubing and round and streamline tubing characteristics for aluminum alloy, carbon steel, and alloy steel.

Underwriters' Laboratories, Inc. Standard for Steel Pipe Lines for Underground Water Service, 1940. Covers 1 1/2 to 3-in. butt-welded, 1 1/2 to 24-in. lap-welded, 14 to 96-in. hammer-welded, 1 1/2 to 26-in. resistance-welded, 4 to 72-in. fusion-welded, 6 to 48-in. spiral-welded, and 1 1/2 to 24-in. seamless steel pipe. Gives requirements for manufacture, chemical and physical properties and tests, weights and dimensions, permissible variations, workmanship and finish, marking, inspection and rejection, protective coating, and appendices.

U. S. Gov., Army Air Forces Specification 10244 (1); 1942. Tubing; Rail Carbon Steel Round, Welded.

U. S. Gov., Army Air Forces Specification 10245 (1); 1942. Tubing; Steel, Carbon, Welded (1025) for Gliders.

U. S. Gov., Army Air Forces Specification 40479; 1944. Pipe Line, Fuel Dispensing, Portable.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-4-1; 1942. Tubing; Steel, Carbon (1025), Welded.

U. S. Gov., Army-Navy Aeronautical Specification AN-FF-C-406a-1; 1944. Clamps; Hose.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-T-846-1; 1942. Tubing; Steel, Carbon (1025), Seamless.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R29-42; 1942. Eaves Trough; Conductor Pipe and Fittings, and Ridge Rolls. This recommendation establishes a simplified schedule of sizes and weights of eaves trough, conductor pipe, fittings, and styles of gutters and ridge rolls. Sponsored by the National Assn. of Sheet Metal Distributors and the National Wholesale Hardware Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Commercial Standard CS5-40; 1940. Pipe Nipples; Brass, Copper, Steel and Wrought-Iron. This standard covers steel, ferrous-alloy, and wrought-iron nipples, black- and zinc-coated (hot dip galvanized), in iron-pipe sizes from 1/8 to 12 in., of standard length; and brass and copper nipples in standard sizes 1/8 to 6 in.. Gives tables showing pipe sizes and various lengths, packaging, and labeling. Initiated by manufacturers, now represented by National Assn. of Pipe Nipples Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Commercial Standard CS7-29; 1929. Standard Weight Malleable Iron or Steel Screwed Unions. This standard covers malleable iron or steel unions for use with standard-weight pipe, and are furnished in black, brass seated and galvanized, brass seated types. It covers general and detail requirements, material and workmanship, and tensile test requirements.

U. S. Gov., Federal Specification WW-N-351; 1930. Amendment 1; 1936. Nipples, Pipe; Brass, Steel, and Wrought Iron. Covers coated and uncoated nipples, in iron pipe sizes from 1/8 to 12 in., of standard lengths; brass nipples in iron pipe sizes from 1/8 to 6 in.; and three types—(A) standard weight, (B) extra strong, and (C) double extra strong. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-P-404; 1944. Pipe; Steel and Ferrous Alloy for Bending, Flanging, etc. (Iron-Pipe Size). Covers black and coated pipe in three types: (I) Steel—carbon, welded and seamless; (II) steel—copper-bearing, welded and seamless; (III) open-hearth iron—copper molybdenum, welded; and three classes—(A) standard weight, (B) extra strong, (C) double extra strong. Gives requirements for material and workmanship, marking, lengths, diameter and thickness, weight tolerances, black pipe, zinc-coated pipe, pipe ends and couplings, pipe threads, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-P-406; 1944. Pipe; Steel and Ferrous Alloy for Ordinary Uses (Iron-Pipe Size). Covers black, coated, or lined pipe in three types: (I) Steel—carbon, welded and seamless; (II) steel—copper-bearing, welded and seamless; (III) open-hearth iron—copper-molybdenum, welded; and three classes—(A) standard weight, (B) extra strong, and (C) double extra strong. Gives requirements for material and workmanship, marking, lengths, diameter and thickness, weight tolerances, black pipe, zinc-coated pipe, cement lined pipe, pipe ends and couplings, pipe threads, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-U-531; 1932. Unions; Malleable Iron or Steel, 250-Pound. Covers two threaded types—(A) black, brass seated; and (B) zinc-coated (galvanized), brass seated. Gives requirements for tensile strength and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-U-531; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for dimensions and packaging.

U. S. Gov., Federal Specification WW-U-536; 1932. Unions; Malleable Iron or Steel, 300-Pound. Covers four types—(XA) black, brass or copper seated; (XB) galvanized, brass or copper seated; (XC) black, all iron or steel; and (XD) galvanized, all iron or steel. Gives requirements for dimensions and tensile strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-U-536; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for dimensions, ultimate loads, marking, and packaging.

U. S. Gov., Navy Dept. Specification 44P10k; 1945. Pipe, Steel; Seamless and Welded, Black and Zinc-Coated (Galvanized).

U. S. Gov., Navy Dept. Specification 44T1c; 1936. Tubing, Steel; Structural.

U. S. Gov., Navy Dept. Specification 44T4d; 1941. Tubing, Steel; Seamless or Welded.

U. S. Gov., Navy Dept. Specification 44T5e; 1943. Tubing, Voice; Brass and Steel.

U. S. Gov., Navy Dept. Specification 44T13b; 1938. Tubing, Steel; Seamless, for Oil, Steam, or Water.

U. S. Gov., Navy Dept. Specification 44T34; 1939. Tubing, Steel; Seamless, Diesel-Engine-Fuel-Injection.

U. S. Gov., Navy Dept. Specification 44T36; 1938. Tubing, Steel; Black, Suitable for Lining With Rubber (for Salt-Water Systems on Naval Vessels).

U. S. Gov., Navy Dept. Specification 44T41a; 1944. Tubing, Steel; Resistance-Welded for Oil, Steam, or Water.

U. S. Gov., Navy Dept. Specification 44T44a; 1944. Tubing, Steel; Rail Carbon, Structural.

U. S. Gov., Navy Dept. Specification 45B5d; 1942. Bushings; Pipe.

U. S. Gov., Navy Dept. Specification 45F7e; 1942. Flanges, Steel; for Steel Tubing, 300 Pounds W.S.P.

U. S. Gov., Navy Dept. Specification 45F15, 1942. Flanges, Steel; for Steel Tubing, 150 Pounds W.S.P.

U. S. Gov., Navy Dept. Specification 45J1; 1938. Joints, Steel; Flexible, for Temporary Pipe Connections.

U. S. Gov., Navy Dept. Specification 45N3; 1941. Nipples, Pipe; Brass, Steel, and Wrought-Iron.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for lap-welded and seamless steel and lap-welded iron boiler tubes, electric-resistance-welded steel and open-hearth iron boiler and superheater tubes (3 grades), seamless steel boiler tubes for high-pressure service, medium-carbon seamless steel boiler and superheater tubes, and carbon-molybdenum alloy-steel boiler and superheater tubes—material, manufacture, chemical composition, tensile properties, check analysis, tests, test specimens, number of tests, retests, forming operations, permissible variations in dimensions and weights, finish, and marking. In substantial agreement with American Society for Testing Materials Standard Specifications A83-40, A178-40, A226-40, A192-40, A210-40, and A209-41T respectively.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for steel pipe—material, chemical composition, tensile requirements, bending properties, tests, finish, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-180D; 1942. Tubing; Mechanical or Structural Steel, Carbon, and Alloy, Seamless, Welded, and Brazed.

References.—Alloy steel tubes and pipe, *see* 622.3; methods of testing, general requirements for metals, *see* 600.1; zinc coatings and tests, *see* 600.3; heat treatments, *see* 600.5; standard threading of tubular goods, *see* 607.0; installation, identification, care of piping, *see* 607.0; steel conduit for electric wiring, *see* 715.11; steel boiler tubes, *see* 703.2; copper slip joints for steam pipes, *see* 642.9; tubular steel trolley poles, *see* 726.2.

607.5 SHEET IRON AND STEEL PIPE

American Assn. of State Highway Officials, M36-42. Standard Specifications for Corrugated Metal Culvert Pipe. Gives scope, materials, fabrication, size and permissible variations, workmanship and finish, marking, inspection and rejection, and testing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specification for Corrugated Metal Culverts. Gives requirements for material—base metal, rivets, weight of zinc coating, sampling, analysis of finished sheet, tests for zinc coating, identification, corrugations, gage determination, and tolerance; fabrication—shape, dimensions, and weight, rivets and riveting, coupling bands, workmanship, mill inspection, field inspection, and acceptance.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Corrugated Metal Pipe for Subdrainage. For use as underdrains and shall be perforated unless otherwise specified. Gives requirements for material, corrugations, perforations, gage and weight, and coupling bands.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Corrugated Structural Plate Culverts and Arches. Includes materials used in field construction of culvert structures which are too large for transportation as finished structures. Gives description of plates, base metal, spelter coating, sampling, chemical analysis and tests for spelter coating, identification, bolts, gage determination and tolerance, field inspection and acceptance of plates, forming and punching plates, minimum gage of side and top plates for pipe structures, minimum and maximum heights of cover for pipes, gage of bottom plates for pipes, gage of plates for arches, number of bolts, skewed pipes and arches, arch substructures and headwalls, multiple pipes, multiple arches, bedding and backfilling pipe structures, backfilling arch structures under new fills, strutting of pipe, and basis of payment.

American Society for Testing Materials, A 211-44; 1944. American Standards Assn., B36.16; 1944. Spiral-Welded Steel or Iron Pipe. Covers 4 to 48-in. diameter, and 1/16 to 11/64-in. wall thickness pipe for conveying liquid, gas, or vapor. Gives requirements for material, manufacture, hydrostatic test, permissible variations in weight and dimensions, length, finish, protective coating, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 211; 1942, affected section 1, scope; section 2, material; and section 8, protective coating.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R29-42; 1942. Eaves Trough, Conductor Pipe, Fittings, and Ridge Rolls. This recommendation establishes a simplified schedule of sizes and weights of eaves trough, conductor pipe, fittings, and styles of gutters and ridge rolls. Sponsored by the National Association of Sheet Metal Distributors and the National Wholesale Hardware Assn.

U. S. Gov., Federal Specification QQ-C-806; 1934. Amendment 2; 1940. Culverts; Iron or Steel, Zinc-Coated. Covers four types—(I) full circle riveted with lap-joint construction; (II) half-circle; (III) wedge lock, lap-joint; and (IV) part-circle with flat bottoms. Gives requirements for material, workmanship, identification, chemical composition, rivets, weight of zinc coating, and construction; methods of sampling, inspection, and tests; packing and marking.

U. S. Gov., Federal Works Agency. Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Corrugated Galvanized Sheet Metal Culvert Pipe.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-39; 1939. Pipe, Stove; Elbows and Joints.

References.—Iron and steel sheets, *see* 604.12, 604.29, 604.32; standard thicknesses of plates and sheets, *see* 604.0; tolerances on weights and thickness of sheets, *see* 600.7; zinc coatings and tests, *see* 600.3; rivet steel, rivets, *see* 603.21, 608.4; sheet metal piping for warm air heating, *see* 614.0, 614.4; masonry culverts, *see* 518.61; copper eaves troughs and conductor pipe, *see* 642.9.

607.6 VALVES, COCKS, AND HYDRANTS, FERROUS AND NONFERROUS

American Gas Assn. American Standards Assn., Z 21.15-1942. Listing Requirements for Gas Valves. Represents basic standards for safe operation, substantial and durable construction, and acceptable performance for gas valves. Addenda to American Standard Listing Requirements for Gas Valves effective Jan. 1, 1944.

American Gas Assn. American Standards Assn. Z 21.21-1935. Listing Requirements for Automatic Main Gas-Control Valves. Represents minimum standards for the performance, safe operation, and substantial and durable construction of gas appliance accessories.

American Gas Assn. American Standards Assn. Z 21.22-1935. Listing Requirements for Relief and Automatic Gas Shut-Off Valves for Use on Water Heating Systems. Includes construction requirements; performance requirements on pressure relief valves, pressure relief elements of combination valves, temperature relief valves, temperature relief elements of combination valves, vacuum relief valves, and vacuum relief elements of combination valves; definitions; and arrangement of apparatus for testing temperature relief valves.

American Petroleum Institute, Div. of Production. Standard 5-F; 1940. Supplement 1; 1941. Specification for Threads in Valves, Fittings, and Flanges (Tentative). Covers dimensional standards for threads and gauges, and gauging practice, for valves, fittings, and flanges intended for use with A.P.I. tubular material, including line pipe, casing, drill pipe, and tubing.

American Petroleum Institute, Div. of Production. Standard 5-G-1; 1938. Standards on Pipe Line Valves (Tentative). Covers contact-face to contact-face dimensions for flanged pipe-line valves, and includes, by reference, minimum chemical and physical properties.

American Petroleum Institute, Div. of Production. Standard 5-G-2; 1941. Standard on Control Valves for Drilling and Production, Well-Control, Repressuring, and Recycling Services—Solid-Wedge and Double-Disc Gate Valves (Tentative). Covers flanged nonrising stem steel drilling-through and flow-line gate valves having integrally forged or cast flanges. Metal other than the parent metal used for valve body seats and wedge faces is not included. Requirements as to material, sizes, design, testing, and marking and for interchangeability, as units, between the products of different manufacturers.

American Petroleum Institute, Div. of Production. Standard 5-G-2A; 1941. Standard on Control Valves for Drilling and Production—Well-Control, Repressuring, and Recycling Services—Flanged Round-Opening Steel Plug Valves (Tentative). Requirements for steel drilling-through and flow-line plug valves with integrally cast or forged steel flanges, having a single through-circular passage, with two-way co-axial bore, tapered or parallel-sided solid or one-piece plug, and integral or separable plug stems. Includes material, sizes, design, testing, and marking, and for interchangeability, as units, between the products of different manufacturers.

American Petroleum Institute, Div. of Refining. Standard 600A-42; 1942. Standard on Flanged Steel Outside-Screw-and-Yoke Wedge Gate Valves. Includes, by reference, requirements on chemical and physical properties and covers the major dimensions for flanged steel wedge gate valves. Dimensions given herein for 150-, 300-, 400-, and 600-lb. classes with raised-face flanges are in agreement with those given in A.P.I. Standards 5-G-1 on Pipe-Line-Valves (tentative). Valves furnished in accordance with this standard will fully meet the requirements for steel wedge gate valves of the corresponding sizes and cold pressure ratings of A.P.I. Standards 5-G-1. The ring-joint requirements and dimensions in this standard are in conformity with A.P.I. Standards 5-G-3 on Ring Joints for Steel Flanges and Flange Unions for general use (Section III, Emergency Revision of A.P.I. Standard 600A issued July 1943 as First Supplement).

American Petroleum Institute, Div. of Refining. Standard 600 B-42; 1942. Standard on Flanged Steel Plug Valves. Includes, by reference, requirements on chemical analysis and physical properties, and covers the major dimensions for flanged steel lubricated and non-lubricated plug valves of either antifriction or plain-stem design. The ring-joint requirements and dimensions in this standard are in conformity with A.P.I. Standards 5-G-3 on Ring Joints for Steel Flanges and Flange Unions for General Use. This standard has been prepared to cover requirements of refineries, natural-gas and natural-gasoline plants, and for any other service for which this type of valve may be considered suitable. Emergency Revision of A.P.I. Standard 600 B, issued July 1943, as First Supplement.

American Society of Mechanical Engineers, joint sponsor with Heating, Piping, and Air Conditioning Contractors' National Assn. and Manufacturers' Standardization Society of the Valve and Fittings Industry. American Standards Assn., B16.10-1939. Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves. Covers: (1) Wedge gate valves—cast-iron, for 125, 175, and 250-lb. steam service pressure and 800-lb. hydraulic pressure; and steel, for 150, 300, 400, 600, 900, and 1,500-lb. steam service pressures; (2) double disc gate valves—cast-iron, for 125, 175, and 250-lb. steam service pressure and 800-lb. hydraulic pressure; (3) globe and angle valves—cast-iron, for 125 and 250-lb. steam service pressure; and steel, for 150, 300, 400, 600, 900, and 1,500-lb. steam service pressures; and (4) swing check valves-cast-iron, for 125 and 250-lb. steam service pressure and 800-lb. hydraulic pressure; and steel, for 150, 300, 400, and 600-lb. steam service pressures.

American Society of Refrigerating Engineers. A.S.R.E. Circular 17; 1939. Standard Method of Rating and Testing Refrigerant Expansion Valves. Includes methods of rating and testing thermostatic and automatic expansion valves.

American Society for Testing Materials, A 95-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-95. American Standards Assn., G17.1; 1944. Carbon-Steel Castings for Valves, Flanges, and Fittings for High-Temperature Service. For pressure containing parts for high temperature service. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, hydrostatic tests, magnetic particle testing, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 95; 1944, affected section 5, chemical composition; section 8, tensile properties; and section 10, hydrostatic tests.

American Society for Testing Materials, A 105-40; 1940. A.S.M.E. Boiler Construction Code Specification SA-105.

American Standards Assn., G17.3-1940. Forged or Rolled Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service. Includes two grades of material based on tensile strength; requirements for manufacture, heat treatment, chemical composition, ladle analysis, tensile properties, test specimen, finish, and inspection.

American Society for Testing Materials, A 126-42; 1942. Gray Iron Castings for Valves, Flanges, and Pipe Fittings. Covers regular, higher-strength gray or semisteels, and high-test regular or alloy composition. Requirements for chemical composition, tensile properties, transverse test, mold, test specimen, etc.

American Society for Testing Materials, A 157-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-157. American Standards Assn., G36.1; 1944. Alloy-Steel Castings for Valves, Flanges, and Fittings for Service at Temperatures From 750 to 1,100° F. Includes nine ferritic and two austenitic grades, selection dependent on design and service. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, number of tests, retests, tensile and bending properties, hydrostatic tests, magnetic particle testing, test specimens, radiographic or destruction tests, workmanship, marking, finish, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 157; 1944, affected section 10, hydrostatic tests.

American Society for Testing Materials, A 182-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-182. American Standards Assn., G37.1; 1944. Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for Service at Temperatures From 750 to 1,100° F. Includes seven ferritic and three austenitic steels, selection dependent on design and service. Gives requirements for manufacture, heat treatment, chemical composition, ladle analysis, check analysis, tensile properties, hydrostatic tests, test specimens, number of tests, retests, macroetch tests, workmanship, finish, marking, inspection, and rejection.

American Water Works Assn. Specifications for Gate Valves for Ordinary Water Works Service, 7F.1-1939. Covers type of valve and character of service, supplementary details, data to be furnished by manufacturer, size of waterway, basis of structural design, iron castings, bronze, workmanship, bell and flanged ends, bodies and bonnets, gates, gate and body rings, wedging device, guides, rollers and tracks for horizontal valves, stem and stem nuts, thrust bearings, stuffing boxes, wrench-nuts, cast-iron gears, encased steel gears, indicators, by-passes, gaskets, bolts and nuts, cast markings, painting, testing, inspection, and preparing for shipment.

American Water Works Assn. Standard Specifications for Fire Hydrants for Ordinary Water Service, 7F.3-1940. Covers kind, type, capacity, size, thickness of wall of barrel, barrel sections, waterway, hydrant inlet, lugs, hose threads, joining nozzles to barrel, nozzle caps, valves readily removable, main valve closed after accident, operating mechanism, stuffing boxes, drain valve mechanism, drain or waste outlet, hydrant top, operating and cap nuts, direction of opening, interchangeability, machined surfaces, water hammer, friction losses, parts of cast-iron, cast-iron, wrought-iron, steel, parts of noncorrodible metal, characteristics of noncorrodible metal, facing of main gate valves against seats, bolts and nuts, test bars, shop inspection, shop tests, marking, coating, and shop coating above ground line.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brine Valve and Operating Rigging, Rules for. Requirements for size of rods, materials for levers, rubber seats, malleable iron castings galvanizing, finish, etc., hand-hole castings design of brine tank, materials, and inspection.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Globe and Angle Valves for Steam Locomotives for 300-Lb. Pressure. Recommended Practice. Materials for valves to follow A.S.T.M. Specification B-61, except stem for outside screw type, seat, gland, and handwheel. Gives detailed drawings and tables for globe and angle valves, valve parts, and marking. Emergency Specification 1942, changed requirements.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specifications for Determining the Size of Safety Valves, Their Application to Locomotives, and Their Repairs. Formula, number required, materials, marking, capacity, location, tests, diagrams, and standard connections.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Tank Car Safety Appliances and Safety Valves for Tank Cars. Detail dimensions and design of valves, 2 and 5-in. sizes, design and dimensions for valve springs, dome cover, safety vent, and I.C.C. requirements. Included in specifications for tank cars.

Chlorine Institute, Inc. Revision of Chlorine Institute, Inc. Drawings Inclusive of Specifications for Valves for I.C.C. Specification 3A 480, Chlorine Cylinders; and for I.C.C. Specification 106 A 500, Containers; also for I.C.C. Specification 106 A 500, Fusible Plugs and Engagement in Heads; 1942.

Chlorine Institute, Inc. Safety Valve for Handling Corrosive Gases, 1 1/2-Inch Valve Size; Style JQ, 1940. Includes dimensional requirements of details and assembly, materials required for each part, and instruction for testing procedure and reconditioning.

Chlorine Institute, Inc. Standard Angle Valve for Chlorine Tank Cars No. 3-B347; 1938. Requirements for design, materials, and details of parts and assembly.

Compressed Gas Manufacturers' Assn. Safety Device Schedule; 1936. Includes classification as frangible disc, fusible plugs, combination frangible dis-fusible plugs, and pop valves; requirements for design and construction, applications for compressed gas cylinders, and definitions.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, 1939. Standard dimensions of valves and fittings and materials. Roughing-in dimensions conform to the Manufacturers Standardization Society of the Valves and Fittings Industry; welding neck flanges conform to A.S.A. Standard B36.10, 1935; and cast iron screwed and flanged fittings to A.S.M.E. Standard B16d, 1927; B16a, 1938; and B16d, 1928.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet D-32. Faucets, Metal, for Discharging Contents of

Steel Barrels or Drums. Recommended Practice. Adopted, 1939. Revised, 1943. Includes diagram of faucet and recommendations for threads, gaskets, shank, and material.

Manufacturers Standardization Society of the Valve and Fittings Industry. Drain Tapping Standard, SP-28; 1937. Applies to ferrous flanged fittings and valve bodies regardless of material or pressure; method of designating location of tapped holes, standard size of drain connection, and maximum pipe thread sizes which may be tapped without boss. Gives symbols, tables of drain sizes and maximum unbossed tappings, and diagrams for fittings and various types of valves.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Valves and Fittings. Covers definition, classification, and standards of the industry.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Recommendations for Uniform Marking of Fire Hydrants. Covers three classes—(A) flow capacity of 1,000 g.p.m. or greater, (B) flow capacity of 500-1,000 g.p.m., and (C) flow capacity of less than 500 g.p.m. Class (A) tops and nozzle caps—green, class (B) tops and nozzle caps—orange, and class (C) tops and nozzle caps—red. All barrels to be chrome yellow. Also covers private hydrants.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipments, 1943. Supervision and Care of Valves. For controlling water supplies for fire protection. Covers introduction of valves, maintenance, notification, inspection after opening, methods of supervision, approved devices and installation, attachment and operation of devices, various systems, emergency sealing, and suggested precautions while water is shut off sprinklers for repairs or alterations.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Valves, Indicator Posts, and Hydrants. Specifications for valves, indicator posts, and hydrants. Covers gate and check valves including outside-screw-and-yoke valves, inside-screw-valves, straightway hose valves, angle hose valves, and swing check valves; indicator posts including vertically moving target type and rotating target type; and hydrants.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Gas Shut-Off Valves. Standards for installation, maintenance, and use of emergency gas shut-off valves. Covers valves, pull boxes, operating handles, connection of valve to operating handle, supplementary control, installation, tests, and inspection.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Drain Cocks. Adopted, 1921. Table of taper pipe thread sizes with equivalent minimum passage diameters.

Underwriters' Laboratories, Inc. Adjustable Pressure Reducers for 2 1/2-Inch Outlets on Interior Standpipes, 1932. Gives requirements for material, range of adjustment, adjustability, adjustment index, operating performance, strength, vanes or baffles, threads, and marking.

Underwriters' Laboratories, Inc. Specification for Indicator Posts (no date). For fire protection gate valve construction standardization of the target mechanism. Covers requirements for vertically moving type, details of barrel, extension rod, post cap, operating stem, handwheel, and target; also variations for rising stem type such as stem diameter, visibility of stem, and marking.

Underwriters' Laboratories, Inc. Standard for Alarm Valves (Section III), Subject 193; 1927. Gives size, type, body and cover, main check, auxiliary check, valve rings and seat rings, valve mechanism, hinge, clearances, drains, retarding chamber, circuit closer or opener, water motor and gongs, marking, construction, practicability, durability, strength, reliability of operation, and uniformity.

Underwriters' Laboratories, Inc. Standard for Angle Hose Valves, Subject 668a; 1937. Sizes of valves for use on standpipes are 1, 1 1/4, 1 1/2, 2, and 2 1/2 in. Gives body and bonnet, seat, disc, stem, stuffing box, hand-wheel, hose nipples, and tests.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Hazardous Liquid Valves, 1930. For dispensing motor fuel at automobile filling stations installed in accordance with regulations of the National Board of Fire Underwriters. Includes shut-off valves (gate, globe, angle, needle), hose-nozzle valves, and hose drain valves. Design and construction of body, stuffing box, and stem, nozzles, operating parts, and tests. Detail dimensional drawings of valves.

Underwriters' Laboratories, Inc. Standard for Hydrants (Private and Municipal Fire Department Service), 1938. Includes compression and gate type valves, two-way, two-way and pumper, three-way, three-way and pumper, four-way or double pumper operating up to 170-lb. pressure. Requirements as to design, materials, hose nipples and valves, operating stem, stuffing box and gland, hydrant top, hose caps, and marking.

Underwriters' Laboratories, Inc. Standard for Inside Screw Valves for Underground Work, 1931. For fire protection gate valves, solid, split wedge, or built-up parallel seat gate types, rated at 175-lb. working pressure. Requirements for design and construction of cast iron body and bonnet, dimensional details, gates, seat rings, thread standards, stem sizes, stuffing boxes, indicator post flange details, and tests.

Underwriters' Laboratories, Inc. Standard for Outside Screw and Yoke Gate Valves, 1931. For fire protection work; standard sizes, types, working pressure, design and construction, and tests.

Underwriters' Laboratories, Inc. Standard for Pressure Regulators or Reducing Valves, 1928. Devices of oxy-acetylene, etc., control of cylinder pressure, in welding and cutting operations. Covers general construction and performance tests.

Underwriters' Laboratories, Inc. Standard for Straightway Hose Valves, Subject 668b; 1937. Size of valves for use on fire pumps and hydrants is 2 1/2 in. and for standpipes 1, 1 1/4, 1 1/2, 2, and 2 1/2 in. Gives type, body and bonnet, gate and seat rings, stem, stuffing box, handwheel, hose nipples, hose caps, and tests.

Underwriters' Laboratories, Inc. Standard for Swing Check Valves (Regular Type), 1931. For fire protection work, requirements as to design and construction of body and bonnet, table of dimensions, seat rings, clapper, hinge, and clearance.

U. S. Gov., Army Air Forces. Specification 40276-A (1); 1940. Valve; Four-Way, De-Icing system, Controlling.

U. S. Gov., Army Air Forces. Specification 40293; 1940. Valve; Four-Way, De-Icing System, Controlling, 3/4-Inch Ports.

U. S. Gov., Army Air Forces. Specification 40383-A; 1942. Valve; Oxygen, Pressure Reduction.

U. S. Gov., Army Air Forces. Specification 40405; 1942. Valve; Oxygen Needle, High Pressure.

U. S. Gov., Army Air Forces. Specification 40406; 1942. Valve; Oxygen Dump.

U. S. Gov., Army Air Forces. Specification 40680; 1944. Valve; Oxygen Cylinder, Emergency.

U. S. Gov., Army Air Forces. Specification 40747-A; 1945. Valve; Vacuum Selector.

U. S. Gov., Army Air Forces. Specification 40779-2; 1945. Valve; Purge (Manifold Pressure Gage Line).

U. S. Gov., Army-Navy Aeronautical Specification AN-C-71a-2; 1944. Cores; High Pressure Air Valve.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-1-1; 1943. Valves; Hydraulic Pressure Relief.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-3-1; 1943. Valves; Hydraulic, Shuttle.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-4-1; 1943. Valves; Hydraulic Directional Control.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-5b; 1944. Valves; Hydraulic Check.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-6; 1944. Valves; Power Brake.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-8-1; 1943. Valves; Vacuum and Pressure System Check.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-9-1943. Valves; hydraulic Controllable Check.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-10a; 1944. Valves; Static Pressure Selector.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-11; 1943. Valves; High Pressure Oxygen Filler.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-12; 1943. Valves; High Pressure Oxygen Line.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-13a; 1944. Valves; High Pressure Oxygen Check.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-14a; 1944. Valves; Low Pressure Oxygen Filler.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-15-1; 1944. Valves; Low Pressure Oxygen Check.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-16a; 1944. Valves; Oil Dilution and Separately Mounted Priming Solenoid.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-17-1; 1944. Valves; Oxygen Cylinder.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-20; 1943. Valves; Air Pump Safety.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-21-1; 1944. Valves; Air Pump Suction Relief.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-22; 1944. Valves; Air Vacuum Regulating (Throttling).

U. S. Gov., Army-Navy Aeronautical Specification AN-V-23; 1944. Valves; Hydraulic Restrictor.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-24-1; 1945. Valves; Vacuum Restricter.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-380. Valve; Siamese Control.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 381. Valve; Pressure-Relief and Check.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications No. 382. Valve; Swinging Check and Bleeder.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R57-32; 1932. Wrought Iron and Wrought Steel Pipe Valves, and Fittings. This recommendation establishes a schedule of diameters and thicknesses of wrought iron and wrought steel pipe valves, and fittings. It covers nominal inside and outside diameters and approximate thicknesses for standard weight, and extra strong and double extra strong pipe. Initiated by Manufacturers Standardization Society of the Valve and Fittings Industry.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R183-42; 1942. Bronze or Brass Valves. This recommendation covers the working steam pressure and sizes of steam rated gate, globe, angle, and check valves. Initiated by the Valve Manufacturers Association.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R184-42, 1942. Iron Body Valves. This recommendation covers the working steam pressure and sizes of steam rated gate, globe, angle, and check valves. Sponsored by the Valve Manufacturers Association.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 201-43; 1943. Iron and Steel Pop Safety Valves. This recommendation greatly reduces the variety of pop safety valves of iron and steel and does not include valves for pressures above 900 lb. per square/inch or temperatures above 900° F. Gives three tables showing details—(1) iron-body valves, (2) carbon-steel-body valves, and (3) alloy-steel-body valves.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 204-44; 1944. Bronze Pop Safety Valves, and Bronze, Iron, and Steel Relief Valves. For steam, oil, water, air, gas, and liquids in industrial service, and for marine service where applicable. Covers materials, construction, springs, maximum service pressure, maximum service temperature, approximate seat diameter, inlet connections, and outlet connections for various sizes and types of bronze pop safety valves, bronze relief valves, iron body relief valves, and steel relief valves.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R205-44; 1944. Iron and Steel Relief Valves for Petroleum, Chemical, and General Industrial Services. Intended primarily for air, gas, vapor, and liquid service requirements for oil refineries, gasoline plants, synthetic rubber projects, and chemical plants. Covers general construction, trim materials, top construction, discharge areas, abbreviations, and identification numbers. Gives tables showing identification number, inlet size, outlet size, discharge area, maximum service pressure, maximum service temperature, inlet flange, and outlet flange for iron-body valves, carbon-steel-body valves, and alloy-steel-body valves.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures for Land Use. Includes requirements for nickel-plated rough or polished brass, compression type lawn faucet, straight or angle pattern, with integral flange tapped for 3/4-in. pipe and with detachable wheel or T-handle key. Emergency Alternate Federal Specification E-WW-P-541a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures for Land Use. Includes requirements for four types of large and small flush valves for water closets, pedestal urinals, and wall and stall urinals. Gives requirements for performance features, backflow preventers, fittings, connections; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures for Land Use. Includes requirements for lavatory self-closing and double faucets; also faucets with drain and supply fittings; bath, for free standing tubs; kitchen, scullery, and service sinks; single faucet with shoulder, shank, and flange type; and faucets for laundry trays. Gives requirements for size, threads, and weight; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipments. Emergency Alternate Federal Specification E-WW-P-541a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures for Land Use. Includes requirements for street washers with automatic nonfreezing drain. Valves shall be connected by two red brass pipes to a cast iron box. Each washer shall be provided with a short T-handle key. Emergency Alternate Federal Specification E-WW-P-541a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures for Land Use. Includes requirements for wall hydrant. Gives requirements for material, design, workmanship, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Federal Specification WW-V-51; 1936. Amendment 1; 1938. Valves, Brass or Bronze; Angle and Globe, 150-Pound, Threaded and Flanged (for Land Use). Covers valves having renewable nonmetallic disc and raised integral seats; up to and including 2 1/2-in. iron pipe size; for general service with steam, hot water, cold water, sea water, air, and gas. Gives requirements for chemical composition, dimensions, and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-V-51; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for sizes, valve stems, handwheels, stuffing boxes, threaded ends, parts, disk holders, composition, physical properties, and dimensions and tests.

U. S. Gov., Federal Specification WW-V-61; 1940. Amendment 1; 1941. Valves, Cylinder; Oxygen (for Standard Industrial Cylinders). Covers four types suitable for working pressure of 2,000 lb. per square inch—(I) flat seat, packed; (II) flat seat, packless; (III) conical seat, packed; and (IV) conical seat, packless. Gives requirements for composition, threads, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification WW-V-76b; 1938. Valves, Gate; 125-Pound, Threaded and Flanged (for Land Use). Covers two types—(I) single wedge disk, and (II) double disk. Gives requirements for chemical composition, physical properties of valve stems, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-V-76B; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for construction, stems, bronze-body valves (designation B), iron-body valves (designation I), rising stem (designation R), threaded ends (designation T), physical properties of valve stems, and methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification WW-V-151; 1937. Amendment 1; 1938. Valves, Radiator; Air, Thermostatic (Gravity Steam-Heating Systems). Covers two types—(I) nonadjustable, and (II) adjustable air vent. Gives requirements for pattern and plating; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Joint Army-Navy Specification JAN-F-163; 1944. Faucets; Compression and Self-Closing Types for Shipboard Use.

U. S. Gov., Navy Dept. Specification 23V2; 1944. Valves; Escape, Air-Regulating, for Navy Standard Diving Helmets.

U. S. Gov., Navy Dept. Specification 30V1g; 1944. Valves; Water-Closet, Flush (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40R1a; 1923. Valve-reseating Outfits.

U. S. Gov., Navy Dept. Specification 45C5b; 1935. Cocks; Ground-Key.

U. S. Gov., Navy Dept. Specification 45R1G; 1943. Regulators; Gas (Acetylene, Hydrogen, and Oxygen Cylinders).

U. S. Gov., Navy Dept. Specification 45R3; 1941. Regulators; Gas (Acetylene, Hydrogen, and Oxygen Cylinder), Two-Stage.

U. S. Gov., Navy Dept. Specification 45V1f; 1939. Valves; Bronze, 100 W.S.P., Gate (Shipboard Use).

U. S. Gov., Navy Dept. Specification 45V4c; 1934. Valves; Hose, Magazine Flood and Sprinkling.

U. S. Gov., Navy Dept. Specification 45V5e; 1938. Valves; Check, for Pressures Not Exceeding 100 Pounds.

U. S. Gov., Navy Dept. Specification 45V8h; 1938. Valves; Pressure-Reducing, Steam (or Air), Pilot Valve Operated, 600-Pound Gage and Less (Shipboard Use).

U. S. Gov., Navy Dept. Specification 45V9e; 1930. Valves; Bronze, 100 W.S.P., Angle, Cross, and Globe.

U. S. Gov., Navy Dept. Specification 45V10e; 1941. Valves; Radiator (Shipboard).

U. S. Gov., Navy Dept. Specification 45V13e; 1941. Valves; Cylinder Gas, Compressed and Liquefied.

U. S. Gov., Navy Dept. Specification 45V14; 1933. Valves; Bronze, 300 W.S.P., Globe, and Angle, Threaded.

U. S. Gov., Navy Dept. Specification 45V16a; 1941. Valves; Sprinkling and Flooding, Electrically (Motor) Operated, and Their Control.

U. S. Gov., Navy Dept. Specification 45V19; 1938. Valves; Forged-Steel, High-Pressure, Angle and Globe, Welding-Ends; Sizes 1/4 Inch to 1 Inch, Inclusive 600 Pounds W.S.P. and 850° F., Maximum Temperature (Shipboard Use).

U. S. Gov., Navy Dept. Specification 45V30; 1944. Valves; Regulating, Fuel-Oil-Pressure.

U. S. Gov., Navy Dept. Specification 57P5; 1941. Pinchcocks, for Rubber Tubing.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for construction of safety valves and relief valves.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Gate Valves, 1942.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Standard-Weight, Flanged Globe, Angle and Cross Valves (undated).

U. S. Gov., Treasury Dept., Procurement Div., 240A; 1942. Valves, Flush; Automatic, Quiet Operating. Gives requirements for type, piston assembly, relief valve, by-pass, threaded connection, handle, flush, pipe, finish, operation, adjustments, quietness, and backflow preventer; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-91-4; 1933. Valve; Portable Chemical Cylinder, MIII.

References.—Methods of testing, general requirements for metals, *see* 600.1; zinc coatings, nickel plating, *see* 600.3; plumbing practice and symbols, *see* 600.6; standard pipe threads, valve sizes, *see* 607.0; installation, identification, care of piping, *see* 607.0; plumbing fixtures, *see* 617.7; cast carbon steel, cast alloy steel, *see* 611.4, 622.5; cast iron, *see* 611.11; cast brass and bronze, *see* 645.21, 646.41; rubber pump valves, *see* 707.3; fire hydrant outlet threading, *see* 974.0; pneumatic tire valves, *see* 206.3, 206.4; brass ingot metal for valves, *see* 644.11; flange fittings for valves, *see* 607.14, 607.2, 607.3, 607.4.

607.7 METALLIC HOSE, FERROUS AND NONFERROUS

American Gas Assn. American Standards Assn., Z 21.32-1942. Listing Requirements for Gas Appliance Connectors of Flexible Metal Tubing and Fittings; Effective January 1, 1943. These requirements apply to gas appliance connectors consisting of a suitable length of braided or nonbraided flexible all-metal tubing of 1/2 to 1 in. nominal internal diameter and having a fitting at each end provided with standard pipe threads for connection to gas appliance and house piping. Includes construction and performance requirements and illustration of bending test.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S.A.E. Recommended Practice for Flexible Steel Conduit, Tubing, and Ferrules. Revised, 1941. General Specifications, dimensions and physical properties, and corrosion test for flexible steel conduit, flexible steel exhaust, heater tubing, and flexible conduit ferrules.

U. S. Gov., Army Air Forces. Specification 10238; 1938. Hose; Metal, Flexible (Corrosion Resisting).

U. S. Gov., Army-Navy Aeronautical Specification AN-T-14-2; 1944. Tubing; Corrosion-Resisting Steel Flexible.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-C-561a—2; 1944. Conduit; Flexible, Shielded.

U. S. Gov., Federal Specification RR-H-651; 1940. Hose; Metallic, Flexible, Interlocking. Galvanized steel or bronze. Gives requirements for material, inside diameter, minimum thickness of metal, pitch per foot, hydrostatic test pressure, inside diameter of coil circle, and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-C-566; 1941. Conduit; Steel, Flexible. Stipulates compliance with Underwriters' Laboratories "Standard for Flexible Steel Conduit." Gives requirements for types, sizes, material and workmanship, thickness, internal diameter, weight, corrosion protection, strength, and flexibility; methods of sampling, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33H10; 1944. Hose; Flexible- Metallic, High-Pressure.

U. S. Gov., Navy Dept. Specification 33H15b; 1944. Hose; Metallic, Flexible.

References.—Methods of testing, general requirements for metals, *see* 600.1; rust-proof coatings, *see* 600.3; rubber metal gasoline hose, *see* 202.32; flexible metallic conduit for electric wiring, *see* 715.11; flexible metallic casing for tachometer drive, *see* 724.22.

608. NAILS, SCREWS, BOLTS, NUTS, AND RIVETS

608.0 GENERAL ITEMS

American Institute of Bolt, Nut and Rivet Manufacturers. Bolt, Nut and Rivet Standards; 1941. Screw-Thread Dimensions and Tolerances (American Standard B1.1-1935). Threads for bolts and nuts, description and definitions, and tables of dimensions and tolerances for coarse-thread, fine-thread, 8-pitch-thread, and 12-pitch-thread series.

American Standards Assn. B 1.4-1942. Straight Screw Threads for High-Temperature Bolting (American War Standard). For use with pressure vessels and steel pipe flanges, fittings, and valves. Covers form of thread, screw thread series, definitions, detail specifications, gaging, and gives tables showing limiting dimensions and tolerances for threads on screws and nuts.

American Standards Assn., B1.6-1944. Screw Threads of Truncated Whitworth Form (American Truncated Whitworth Threads) (American War Standard). Gives scope, interchangeability with British Standard Whitworth Threads, thread specifications, gages and gaging, tap drill sizes, example of interchangeability, figures, and tables giving data.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Screw Thread Standards. Revised, 1938. The Sellers or Franklin Institute (U. S. Standard) system of screw threads, bolt heads and nuts, is the standard of the A.A.R. except for pipe work and special locomotive work. Gives diagram and formula.

Manufacturers Standardization Society of the Valve and Fittings Industry. Screw Thread Standard for Straight Screw Threads for High Temperature Bolting SP-29; 1943. Covers the limiting dimensions and tolerances for screw threads on high temperature bolting for use with pressure vessels and steel flanges, fittings, and valves. Gives form of thread, screw thread series, definitions, detail specifications, gaging, and tables for straight screw threads for high-temperature bolting with limiting dimensions and tolerances for threads on screws and threads on nuts in standard sizes from 1/4 in. to 3 1/2 in.

Society of Automotive Engineers. Aeronautical Standard 82; 1942. Screw Thread Form, American National, Modified (National Round—NR). An external screw thread form with rounded root for application to highly stressed parts. Diagrammatic dimensional drawing and table of pitches, etc.

Society of Automotive Engineers. Aeronautical Standard 83; 1942. Screw Threads, Aeronautical. Table of coarse, fine, extra fine, 8-thread series, 12-thread series, and 16-thread series for sizes from 0 to 4.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn., B1.1-1935. National Standard Screw Threads for Bolts, Nuts, Machine Screws, and Threaded Parts. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, Screw-Thread Standards for Federal Services.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn., B1.3-1941. Acme and Other Translating Threads. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, Screw-Thread Standards for Federal Services.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Recommended Practice for Slots and Cotter Pin Holes, Cap Screws, and Bolts. Revised, 1942. Table of sizes and dimensions.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Standard Screw Threads. Revised, 1942. Standard screw thread series table of threads per inch in coarse, fine, extra fine, 8-thread series, 12-thread series, and 16-thread series for sizes 0 to 6; general dimensions for screws (classes 2 and 3 fits) and nuts (classes 1, 2, and 3 fits) in coarse threads and screws (classes 2 and 3 fits) and nuts (classes 2 and 3 fits) in fine threads; screws (classes 2 and 3 fits) and nuts (classes 2 and 3 fits) for extra fine, 8-, 12-, and 16-thread series; and class 2 fit screws and nuts for special pitch series.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Standard Wrench Head Screw and Bolt Heads, Nuts, and Wrench Openings. Revised, 1942. Diagrams and tables of sizes and dimensions for regular and heavy bolt heads, cap screw heads, set screw heads; regular, heavy, and light nuts and jam nuts; regular, heavy, light, and light thick slotted nuts, machine screw and stove bolt nuts; light thick nuts, light castle nuts, and wrench openings for same.

U. S. Gov., Army-Navy Aeronautical Specification AN-GGG-S-126a; 1943. Screw-Threads; Standard, Aircraft.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); American National form of thread; American National thread series; screw threads of special diameters, pitches, and lengths of engagement; wrench-head bolts and nuts, and wrench openings; round unslotted head bolts; machine screws, machine-screw and stove-bolt nuts, and set screws; socket set screws, socket-head cap screws, and socket-head shoulder screws; Acme threads; and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS24-43; 1943. Screw Threads and Tap-Drill Sizes. The purpose of this standard is to make available for convenient shop use and acceptance inspection the essential specifications, definitions, and dimensional data on screw threads and tap-drills, which are recorded more completely in Screw Thread Standards for Federal Services—1942, National Bureau of Standards Handbook H28. Sponsored by the National Screw Thread Commission (succeeded by Interdepartmental Screw Thread Committee).

608.1 NAILS, BRADS, STAPLES, AND TACKS

608.11 Nails

American Iron and Steel Institute. Wire Nails, 1939. Identification Marks Used by Representative American Producers. Detail illustrations of the markings used on roofing and common nails to distinguish the products of various manufacturers.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Slate Roofing. Gives requirements for nails.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Dating Nails. Gives requirements for material, design, and inspection.

American Society for Testing Materials, D 249-44T; 1944. Tentative Specifications for Asphalt Roofing Surfaced With Coarse Mineral Granules. Covers asphalt roofing in sheet form surfaced with colored mineral granules, either 36 or 32 in. in width, composed of roofing-felt saturated and coated on both sides with asphalt and surfaced on the weather side with granulated slate or equivalent mineral material (of solid or mixed colors as may be agreed upon by the purchaser and the seller), and on the reverse side with powdered talc or mica. Manufacture, character of felt, saturant, and coatings; physical properties, surface finish, gage, saturation, packing, nails and lap-cement, sampling and testing, inspection, and basis of rejection. A. S. T.M. Emergency Alternate Provision EA-D 249b; 1944, affected section 6, surface finish; table I, physical requirements of asphalt roofing; section 10, packing; and section 12, nails and lap-cement.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-55; 1935. Dating Nail AAR-1-A. For flat headed copper nail, for dating purposes, with dimensional requirements.

Contracting Plasterers' International Assn. Standard Specification. Includes requirements for nails.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R47-28; 1928. Cut Tacks and Small Cut Nails. This recommendation establishes a schedule of standard sizes, style, and finishes for bill posters tacks, carpet, upholsterer, trimmer, basket, trunk, solid head lining, gimp, lace, hide tacks, clout nails, trunk and basket nails, copper and galvanized tacks, shoe nails and tacks.

U. S. Gov., Federal Specification FF-N-101; 1932, Amendment 6; 1944. Nails, Spikes, Staples, and Tacks. Nails. Covers 44 different types. Gives requirements for materials, quality of various metals, workmanship, dimensions, tolerances, and tables covering details; methods of inspection and tests; and packing and marking.

U. S. Gov., U. S. Army. Quartermaster Corps. Specification 29-84; 1939. Nails; Horseshoe.

References.—Methods of testing, general requirements for metals, *see* 600.1; noncorrosive coatings and test, *see* 600.3; steel and iron wire gages, *see* 603.40.

608.12 Brads

References.—Methods of testing, general requirements for metals, *see* 600.1; noncorrosive coatings and test, *see* 600.3; steel and iron wire gages, *see* 603.40.

608.13 Staples

Package Research Laboratory. Bulletin 309; 1943. Wire for All-Bound Rock Fastener 4-One Boxes and Crates. Wire is technically described as low carbon steel wire and is divided into two general types—(a) stapling wire and (b) binding wire. Gives details covering physical properties of wire; details for each type including sizes, grades, and finishes; Rockaway wire tester, purchase specifications for wire, and details concerning staples.

U. S. Gov., Federal Specification FF-N-101; 1932. Amendment 6; 1944. Nails, Spikes, Staples, and Tacks. Staples. Covers electrician's, metal lath, poultry netting, and wire fence staples. Gives requirements for materials, quality of various metals, workmanship, dimensions, tolerances, and tables covering details; methods of inspection and tests; and packing and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-297B; 1933. Staple; Insulated for Inside Wiring.

References.—Methods of testing, general requirements for metals, *see* 600.1; noncorrosive coatings and tests, *see* 600.3; steel and iron wire gages, *see* 603.40.

608.14 Tacks

U. S. Gov., Federal Specification FF-N-101; 1932. Amendment 6; 1944. Nails, Spikes, Staples, and Tacks. Tacks. Covers billposters, carpet, copper, galvanized, double pointed, gimp, saddle, shoe, and upholsterer's tacks. Gives requirements for materials, quality of various metals, workmanship, dimensions, tolerances, and tables covering details; methods of inspection and tests; and packing and marking.

U. S. Gov., Federal Specification FF-T-311a; 1943. Thumb-Tacks. Covers two types: (I) Draftsmen steel head and (II) general purpose, in four classes—A, solid head; B, head with pin extended through; C, colored head; and D, stamped steel (cut out). Gives requirements for material, workmanship, sizes, bid samples, and details; sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 649; 1944. Tacks; Map. Covers two types—(I) spherical head, and (II) flat head. Type II shall have three classes—A, round; B, square; and C, triangular; and three styles—1, plain; 2, numbered; and 3, lettered. Gives requirements for metal, glass, plastic, workmanship, design heads, tolerances in the dimensions of heads, pins, finish, and details for each type including shape, sizes, and colors; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-7; 1923. Pin; Push.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-8; 1926. Pin; Map Tack, Colored Head.

U. S. Gov., U. S. Army, Medical Department. Specification 42-38; 1939. Pin; White Head.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-298A; 1933. Tack; Types IW-9 and IW-10, for Inside Wiring.

References.—Methods of testing, general requirements for metals, *see* 600.1; noncorrosive coatings and tests, *see* 600.3; steel and iron wire gage, *see* 603.40.

608.15 Spikes

U. S. Gov., Federal Specification FF-N-101; 1932. Amendment 6; 1944. Nails, Spikes, Staples, and Tacks. Spikes. Covers barge, boat, common, gutter, round wire, and track spikes. Gives requirements for materials, quality of various metals, workmanship, dimensions, tolerances, and tables covering details; methods of inspection and tests; and packing and marking.

References.—Railway track spikes, *see* 606.5; methods of testing, general requirements for metals, *see* 600.1; steel and iron wire gages, *see* 603.40.

608.2 SCREWS

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 20; 1943. Screw—Post, Connector Panel, Electrical. Gives drawings with dimensions and notes. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 192; 1944. Screw—Post, Molded Connector Panel, Electrical. Gives drawings with dimensions and notes. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 200 and 202; 1944. Screws—Flush Head, 100° Countersunk and Round Head, Phillips Recess, Low Carbon Steel and Brass. Gives drawings with dimensions and notes. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 201 and 203; 1944. Screws—Flush Head, 100° Countersunk and Round Head, Frearson Recess, Low Carbon Steel and Brass. Gives drawings with dimensions and notes. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 204, 205, 206, 207, 208, 209, 210, and 211; 1944. Screws—100° Flush Head, Phillips, Recess, Aluminum Alloy, Bronze and Alloy Steel. Gives drawings with dimensions and notes for Nos. 8-32, 10-32, 1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, and 9/16-18. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 212, 213, 214, 215, 216, 217, 218, and 219; 1944. Screws—100° Flush Head, Frearson Recess, Aluminum Alloy, Bronze and Alloy Steel. Gives drawings with dimensions and notes for Nos. 8-32, 10-32, 1/2-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, and 9/16-18. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 220, 221, 222, 223, 224, 225, 226, and 227; 1944. Screws—Brazier Head, Phillips Recess. Gives drawings with dimensions and notes for Nos. 8-32, 10-32, 1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, and 9/16-18. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 228, 229, 230, 231, 232, 233, 234, and 235; 1944. Screws—Brazier Head, Frearson Recess. Gives drawings with dimensions and notes for Nos. 8-32, 10-32, 1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, and 9/16-18. Developed by National Aircraft Standards Committee.

American Institute of Bolt, Nut and Rivet Manufacturers. Bolt, Nut and Rivet Standards, 1941. Includes tables of sizes and dimensions (American Standards B18c-1930) for machine screws—flat, round, oval, and fillister head; and wood screws—round, flat, and oval head.

Edison Electric Institute. Suggestions for Lag Screws, No. TD-3; 1938. For use in overhead construction. Gives requirements for material, dimensions, threads, strength, preferred sizes and kinds, finish, packing and shipping, inspection, rejections, and dimensional drawings.

Radio Manufacturers Assn. Machine Screws, M4-101, M4-115, and M4-116; 1942. For split knurl shaft end and medium fit screws in the fine thread series, table of dimensions for 1/4 to 7/8 in. screws. Conforms to S.A.E. standards. Standard machine screws conform to American Standard approved by the American Standards Assn.

Society of Automotive Engineers. Aeronautical Standards 31 and 32; 1941. Screw Heads, Flat Fillister (Aircraft Engine). Diagrammatic dimensional drawings of (31) regular type and (32) lockwire type, cadmium plated, nickel molybdenum steel screw heads No. 10 to 3/8 in. in size.

Society of Automotive Engineers. Aeronautical Standard 77; 1942. Screw; De-Icer Attachment. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard 78; 1942. Screw; De-Icer Rivnut Plug. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard 135; 1943. Screw Heads, Flat Fillister—Large Fillet Aircraft Engine. Diagrammatic drawing.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn., B18c-1930. Slotted Head Proportions of Machine Screws, Cap Screws, and Wood Screws. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, Screw-Thread Standards for Federal Services, listed below.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn., B18.3-1936. Socket Set Screws and Socket Head Cap Screws. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, Screw-Thread Standards for Federal Services, listed below.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn. B18.3a-1944. Supplement to American Standard Socket Set Screws and Socket Head Cap Screws. Gives drawings and table showing data for hexagonal and fluted type socket head shoulder screws (stripper bolts) optional.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Standard Slotted Head Screws. Adopted, 1930. Diagrams and tables of sizes, tolerances and dimensions for flat head machine and cap screws, fillister head machine and cap screws, button head cap screws, flat head machine screws, oval head machine screws, round head machine screws, and round and oval head wood screws.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-24a; 1944. Screws; Self-Tapping Steel.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-52; 1944. Screws; Machine, Cap and Set.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); machine screws, machine-screw and stove-bolt nuts, and set screws; socket set screws and socket-head cap screws; and appendixes containing supplementary information or both a general and a technical nature, including such specifications as are not intended to be mandatory.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Commercial Standard CS37-31; 1931. Steel Bone Plates and Screws. A commercial standard selected and adopted by industry for Sherman type bone plates made of chromium-vanadium steel, requirements on chemical composition of plates and screws corresponding to S.A.E. steel No. 6150, hardness, dimensions and design for 14 plate sizes, and 11 screw sizes. Sponsored by the American College of Surgeons.

U. S. Gov., Federal Specification FF-H-136, 1936. Hardware and Fittings; for Lavatory Partitions and Inclosures. Covers hardware and fittings for lavatory stall and shower partitions and inclosures of marble, slate, or glass. Types for marine use are not included. Includes bolts, latches, screw fastenings, partition fittings, gravity and spring hinges, hooks, top and bottom partition standards, strikes, top rail and shower curtain rods and fittings. Gives requirements covering dimensions, illustrations, composition of material used, workmanship, fastenings, finish, and details; methods of inspection and tests; and packing and marking. Emergency Alternate Federal Specification E-FF-H-136; July 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-S-91; 1934. Screws, Machine; Including Screws, Set. Covers five types of machine screws—(I) flat head, (II) round head, (III) oval head, (IV) oval fillister head, and (V) flat fillister head; and nine types of set screws—(A) square head, cup point; (B) square head, round point; (C) square head, cone point; (D) headless, cup point; (E) headless, round point, (F) headless, cone point; (G) socket head, cup point; (H) socket head, round point; and (I) socket head, cone point. Covers material and workmanship; general requirements; detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 42S1h; 1942. Screws; Wood, Lag or Coach and Hanger.

U. S. Gov., Navy Dept. Specification 42S5e; 1944. Screws—Machine, Cap and Set; and Nuts.

U. S. Gov., Navy Dept. Specification 43S4; 1936. Screws, Machine; and Nuts, Aluminum-Alloy and Steel (Corrosion-Resisting) (Aircraft Use).

U. S. Gov., Treasury Dept., Procurement Div., 530; 1942. Screw-Eyes. Covers five classes—(A) Large eye, regular shank; (B) medium eye, regular shank; (C) medium eye, short shank; (D) small eye, regular shank; and (E) small eye, short shank. Shall be formed of smooth wire stock. Gives requirements for sizes, tolerances, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 660; 1944. Screws; Thumb, Steel. Covers one type and two classes—(A) with shoulder and (B) without shoulder. Gives requirements for sizes, material, workmanship, threads, manufacture, style of point, flattening test, case hardening, surface finish, marking, and details for each class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 29-37A; 1934. Screw; Lag, for Telephone Line Construction.

References.—Methods of testing, general requirements for metals, *see* 600.1; noncorrosive coatings and tests, *see* 600.3; standard threads, *see* 608.0; bolt and screw stock steel, *see* 603.21; brass screw stock, *see* 645.11; rigging screws, *see* 608.7; packaging of lag bolts, *see* 608.31.

608.3 BOLTS AND NUTS, EXCEPT RAILWAY TRACK BOLTS

608.30 General Items

American Society of Mechanical Engineers, Society of Automotive Engineers, sponsors. American Standards Assn., B 18.2-1941. American Standard Wrench-Head Bolts and Nuts and Wrench Openings. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H 28, Screw-Thread Standards for Federal Services, listed below. This 1941 Standard is a comprehensive revision of the 1933 Report, with many of the dimensions changed, footnotes amplified, much new material added, and some 65 illustrations included. Dimensions are for—regular series; heavy series; cap screw heads; set screw heads; regular nuts, jam nuts, and slotted nuts; machine screw and stove bolt nuts; heavy nuts and jam nuts; heavy slotted nuts; light nuts and light jam nuts; light thick nuts; light slotted nuts; light thick slotted nuts; light castle nuts; and open end wrench openings for regular, heavy, and light series bolts and nuts. An appendix gives the formulas upon which dimension and tolerance are based and the thread length.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn., B18.2-1941. American Standard Wrench-Head Bolts and Nuts and Wrench Openings. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, Screw-Thread Standards for Federal Services.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); American National form of thread; American National thread series; wrench-head bolts and nuts; round unslotted head bolts; and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

608.31 Bolts

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 28; 1941. Bolt—Tank Strap; Adjustment. Gives drawings with dimensions and notes. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 144, 145, 146, 147, 148, 149, 150, 152, 154, 156, and 158; 1943. Bolts—Internal Wrenching, Steel. Gives drawings with dimensions and notes for Nos. 1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, 9/16-18, 5/8-18, 3/4-16, 7/8-14, 1-14, and 1 1/8-12. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 172, 174, 176; 1944. Bolt—Interval Wrenching; Steel. Gives drawings with dimensions and notes for Nos. 1 1/4-12, 1 3/8-12, and 1 1/2-12. Developed by National Aircraft Standards Committee.

American Institute of Bolt, Nut and Rivet Manufacturers. Bolt, Nut and Rivet Standards, 1941. Includes tables of dimensions for regular bolt heads (American Standard B18.2-1941) (unfinished square and hexagon, semifinished hexagon); heavy bolt heads (American Standard B18.2-1941) (unfinished square and hexagon, semifinished hexagon); cap screw heads (hexagon); set screw heads (American Standard B18.2-1941) (square); tap bolts (square and hexagon); body bolts (turned or ground); joint bolts; lag bolts; square neck, ribbed neck, fin neck, and countersunk carriage bolts (American Standard B18.5-1939); button head, step, and countersunk bolts (American Standard B18.5-1939); plow bolts (round head, square neck, countersunk; square head, countersunk; round head, heavy key countersunk; round head, reverse key, countersunk); stud bolts (tap end, double end, continuous thread); hanger bolts (plain or ribbed shoulder); elevator bolts (flat head, countersunk; ribbed headslotted and unslotted); T-head bolts; bent bolts (J, hook round bend, hook square bend, hook right angle bend, hook special, eye closed, eye open, U round bend, U square bend); deck bolts; askew head bolts; T-bolts for use in American Standard T-slots (Tentative American Standard B5a-1927); and thread length and length tolerance of bolts (standard, lag, and tap).

American Society of Mechanical Engineers. Joint sponsor with National Machine Tool Builders Assn. and Society of Automotive Engineers. American Standards Assn., B5.1-1941. T Slots, Their Bolts, Nuts, Tongues, and Cutters. Tables of dimensions and tolerances of standard sizes.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers. American Standards Assn., B18f-1928. Plow Bolts. Tables of dimensions and threads for round head, square neck; for square head; for round head, heavy key; for round head reverse key countersunk plow bolts.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification for Bolts, Nuts, and Threads, 1943. The recommended specifications are current American Standards B18.2 (Wrench-Head Bolts and Nuts and Wrench Openings) and B1.1 (Screw Threads) issued by A. S. A. Unless otherwise specified, bolts and nuts shall be of steel, hot-rolled or cold-finished, and shall be American Standard regular, unfinished.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Boiler Studs. Recommended Practice, adopted 1943. Gives drawings and tables showing dimensions for standard studs and studs with oversize butts.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Cylinder and Valve Head Studs. Recommended Practice, revised 1943. Gives drawings and table showing dimensions.

Edison Electric Institute. Suggestions for Specifications for Bolts and Nuts, TD-1; 1937. Covers machine bolts, double arm bolts, carriage bolts, guy clamp bolts and nuts, and other small bolts commonly used in overhead line construction. Gives requirements for material, dimensions, threads, strength, galvanizing, preferred sizes, finish, packing and shipping, inspection, rejection, and dimensional drawing.

Edison Electric Institute. Suggestions for Specifications for Eye Bolts, TD-4; 1939. For use in overhead line construction. Gives requirements for material, dimensions, threads, strength, galvanizing, preferred sizes, finish, packing and shipping, inspection, rejections, and dimensional drawing.

Plain Washer Manufacturers' Assn. Expansion Plugs—Steel, 1938. Gives diameters, thickness of metal, radius, and number of pieces per pound for various standard sizes.

Society of Automotive Engineers. Aeronautical Standard 30; 1941. Bolt Heads; Hexagon (Aircraft Engine). Diagrammatic dimensional drawings for cadmium plated steel bolts 1/4 in. to 3/4 in. in size.

Society of Automotive Engineers. Aeronautical Standard 134; 1943. Bolt Heads; Hexagonal—Large Fillet Aircraft Engine. Diagrammatic drawing.

Society of Automotive Engineers and American Society of Mechanical Engineers, Sponsors. American Standards Assn., B18.5-1939. Round Unslotted Head Bolts; Carriage Bolts; Button-Head, Step, and Countersunk Bolts; Bolt and Thread Lengths. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, Screw-Thread Standards for Federal Services, listed below.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S. A. E. Standard Connecting Rod Bolts, revised 1941. Gives diagram and table of sizes and dimensions.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S. A. E. Standard Round Unslotted Head Bolts, corrected 1942. Diagrams and tables of sizes, dimensions and tolerances for square, fin and ribbed neck carriage bolts, step bolts, button head bolts, countersunk carriage bolts and countersunk bolts; and table of minimum usable thread lengths of round unslotted head bolts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1942. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); American National coarse- and fine-thread series for bolts, nuts, tapped holes, and general application (form of thread, thread series, classification and tolerances, tables of limiting dimensions, and gages); wrench-head bolts and nuts (series of bolt heads and nuts, recommended requirements for bolts and cap screws, tables of dimensions for bolts and cap screws, recommended requirements and tables of dimensions for nuts); round unslotted head bolts (recommended requirements for workmanship, thread series, and details of design, and tables of dimensions for square-neck, ribbed-neck, fin-neck, and countersunk carriage bolts, button-head bolts, stay bolts, and countersunk bolts); and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R23-24; 1924. Plow Bolts. This recommendation establishes a simplified list of types and sizes of plow bolts. Sponsored by Farm Equipment Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R60-43; 1943. Packaging of Carriage, Machine, and Lag Bolts. This recommendation establishes packing lists showing full-container quantity and approximate gross weight for each size and type of bolt covered, also the approximate weight per 100 bolts for each type and size of bolt. Sponsored by the American Institute of Bolt, Nut, and Rivet Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R169-37; 1937. Machine, Carriage, and Lag Bolts (Steel) (Stock-Production Sizes). This recommendation establishes a simplified schedule of stock-production sizes of square-head and hexagon-head machine bolts, square-neck carriage bolts, and lag bolts. Sponsored by the American Institute of Bolt, Nut, and Rivet Manufacturers.

U. S. Gov., Federal Specification FF-B-561; 1937. Bolts; Lag, Steel (Lag-Screws). Covers uncoated and zinc-coated, square head lag-bolts in four types—(1) gimlet point, cut thread, unfinished; (2) gimlet point, rolled thread, unfinished, shouldered; (3) cone point, cut thread, unfinished; and (4) cone point, rolled thread, unfinished, shouldered; three grades—(A) alloy or carbon steel, (B) carbon steel, and (C) commercial steel; in standard sizes—No. 10 to 1 1/4-in. nominal diameter, inclusive; and in lengths from 1 to 16 in., inclusive. Gives general and detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification FF-B-571a; 1934. Amendment 1; 1935. Bolts; Nuts; Studs; and Tap Rivets (and Material for Same). Includes three types of bolts—(A) square head (unfinished, semifinished, and finished), (B) hexagonal head (unfinished, semifinished, and finished); and (C) round unslotted head (button head and square neck carriage). Gives general and detail requirements; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 1B2c; 1942. Bolts and Clips, Alloy Steel; and Nuts, Carbon-Steel; Holding-Down, for Ordnance Mounts.

U. S. Gov., Navy Dept. Specification 43B2d; 1937. Bolts (and Nuts); Deck.

U. S. Gov., Navy Dept. Specification 43B11c; 1936. Studs; Bolts; Nuts; and Tap Rivets (and Material for Same).

U. S. Gov., Navy Dept. Specification 43B14d; 1943. Bolt-Studs, Nuts, and Bars; Round, Steel, for Service at Temperatures Up to 850° F.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for alloy-steel bolting material for boiler and pressure vessel parts or attachments, valves, flanges, and fittings for high-temperature service to 1,000° F.—process, heat treatment, chemical composition, tensile properties, Brinell hardness test, workmanship, finish, and nuts and washers.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels, and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for two grades (A and B) of stay-bolt steel—process, chemical composition, bending properties, test specimens, number of tests, permissible variation in diameter, finish, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 553; 1942. Bolts; Toggle. Covers—type I, two-piece wing, trunnion nut on wing; and type II, one-piece (solid) wing; each with four styles—(1) round head bolt, (2) flat head bolt, (3) oven (mushroom) head bolt, (4) threaded rod with nut. Two classes—(A) trunnion nut on wing, and (B) riveted wing threaded rod with nut. Gives requirements for material, finish, threaded members, diameter of bolt, length of bolt, threads per inch, spread of wing, thickness of steel of wing, wing, removable bolt, and threaded rod; methods of sampling and inspection; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 576; 1942. Anchors; Bolt, Concrete and Masonry (for Use With Caulking Tool). Covers—type I, head out, and type II, nut out; class A, with stud bolt; class B, without bolt, long; and class C, without bolt, short. Gives requirements for material, caulking tool, measurement of screws, threading, finish, size, threads per inch, length of anchor, length of bolt, proof load, and recommended safe load; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 584; 1942. Shields; Expansion, Metal. Covers—type I, lag screw; type II, machine bolt; class A, closed end (bottom bearing); class B, open end; style 1, single, and style 2, double. Gives requirements for material, finish, threaded members, marking, screws, diameter of lag screw or bolt, outside diameter of shield, length of shield, and proof load; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Alloy steel bolts, *see* 622.1; methods of testing, general requirements for metals, *see* 600.1; noncorrosive coatings and tests; *see* 600.3; standard threads and threading, *see* 608.0, 608.30; stock for steel and alloy steel bolts, *see* 603.21, 622.1.

608.32 Nuts

American Institute of Bolt, Nut and Rivet Manufacturers. Bolt, Nut and Rivet Standards, 1941. Include tables of dimensions (American Standard B18.2-1941) for regular, heavy, and light nuts and jamb nuts (unfinished and semifinished); regular, heavy, light, and thick light semifinished slotted nuts; light thick semifinished hexagon nuts; light semifinished hexagon castle nuts; and square and hexagon machine screw and stove bolt nuts.

American Society of Mechanical Engineers. Joint sponsor with National Machine Tool Builders Assn. and Society of Automotive Engineers. American Standards Assn., B5.1-1941. T Slots, Their Bolts, Nuts, Tongues, and Cutters. Tables of dimensions and tolerances of standard sizes.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification for Bolts, Nuts, and Threads, 1943. The recommended specifications are current American Standards B18.2 (Wrench-Head Bolts and Nuts and Wrench Openings) and B1.1 (Screw Threads) issued by A.S.A. Unless otherwise specified, bolts and nuts shall be of steel, hot-rolled or cold-finished, and shall be American Standard regular, unfinished.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Castle Nuts, Cotter Pins, and Location of Cotter Pin Holes in Projecting Bolt Ends. Table of dimensions and standard designs for bolt ends, castle nut, cotter and taper pins.

Edison Electric Institute. Specifications for Bolts and Nuts, TD-1; 1937. Includes machine bolts, double arm bolts, carriage bolts, guy clamp bolts and nuts, and other small bolts commonly used in overhead line construction. Requirements as to materials and galvanizing in accordance with A.S.T.M. specifications listed, dimensions follow American Standards, except guy clamp bolt as per dimensional diagram, thread, strength, preferred sizes, finish, and packaging.

Society of Automotive Engineers. Aeronautical Standards 33, 34, and 35. Nuts; Aircraft Engine. Diagrammatic dimensional drawings of (33) plain hexagonal, (34) castellated hexagonal, and (35) shear slotted hexagonal cadmium plated, nickel molybdenum steel nuts 1/4 in. to 1 in. in size.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Recommended Practice for Slots in Plain Nuts and for Cap or Acorn Nuts, revised 1942. Gives diagrams and tables showing sizes and dimensions.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Standard High Nuts, revised 1942. Diagram and table of sizes and dimensions.

U. S. Gov., Army Air Forces. Specification 25531-2; 1944. Nuts; Self-Locking (High Temperature).

U. S. Gov., Army Air Forces. Specification No. 25533; 1942. Nuts; Sheet Spring.

U. S. Gov., Army Air Forces. Specification No. 25535; 1944. Nut; Instrument Mounting.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-2; 1943. Nuts; Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-5; 1944. Nuts; Self Locking.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1942. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); American National coarse- and fine-thread series for bolts, nuts, tapped holes, and general application (form of thread, thread series, classification and tolerances, tables of limiting dimensions, and gages); wrench-head bolts and nuts (series of bolt heads and nuts, recommended requirements for bolts and cap screws, tables of dimensions for bolts and cap screws, recommended requirements and tables of dimensions for nuts); round unslotted head bolts (recommended requirements for workmanship, thread series, and details of design, and tables of dimensions for square-neck, ribbed-neck, fin-neck, and countersunk carriage bolts, button-head bolts, stay bolts, and countersunk bolts); and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

U. S. Gov., Federal Specification FF-B-571a; 1934. Amendment 1; 1935. Bolts; Nuts; Studs; and Tap Rivets (and Material for Same). Includes two types of nuts—(A) hexagonal (unfinished regular, semifinished regular, finished regular, castle, semifinished jam, finished jam, and light); and (B) square (unfinished regular, semifinished regular, and semifinished jam). Gives general and detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 43B2d; 1937. Nuts (and Bolts); Deck.

U. S. Gov., Navy Dept. Specification 43B11c; 1936. Nuts; Bolts; Studs; and Tap Rivets (and Material for Same).

U. S. Gov., Navy Dept. Specification 43B14d; 1943. Bolt-Studs, Nuts, and Bars; Round, Steel, for Service at Temperatures Up to 850° F.

U. S. Gov., Navy Dept. Specification 45L1; 1934. Locknuts; Iron (Cast).

U. S. Gov., Navy Dept. Specification 45N1d; 1941. Locknuts; Bronze.

U. S. Gov., Navy Dept. Specification 43S4; 1936. Nuts (and Screws); Machine, Aluminum-Alloy and Steel (Corrosion-Resisting) (Aircraft Use).

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for carbon and alloy-steel nuts for bolts used in high-temperature service up to 1,000° F.—process, fabrication, stress relieving, chemical composition, tests, and finish.

References.—Methods of testing, general requirements for metals, *see* 600.1; noncorrosive coatings and tests, *see* 600.3; standard threads and threading, *see* 608.0, 608.30; stock for steel and alloy steel bolts, *see* 603.21, 622.1; lock nuts for ball bearings, *see* 766.2.

608.4 RIVETS, IRON OR STEEL

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 177 and 178; 1943. Pin, 100°C.; Sunk Head Hi-Shear Rivet and Pin; Flat Head Hi-Shear Rivet. Gives drawings with dimensions and notes. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 179; 1944. Collar; Hi-Shear Rivet. Gives drawing with dimensions and notes. Developed by National Aircraft Standards Committee.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Iron Rivets. Includes rules for inspection and tests.

American Institute of Bolt, Nut and Rivet Manufacturers. Bolt, Nut and Rivet Standards, 1941. Includes tables of dimensions (American Standard B18a-1927) for small rivets—flat head, countersunk head, button head, pan head, truss or wagon-box head, tinners', coopers', and belt rivets; and tables of dimensions (American Standard B18.4-1937) for large rivets; hold-on (dolly bar) and rivet set impressions—button head, high button head, cone head, flat-top countersunk head, round-top countersunk head, pan head, and swell neck; and table of weights of rivets.

American Society of Mechanical Engineers and Society of Automotive Engineers, sponsors. American Standards Assn., B 18a-1927, with 1942 addendum, B 18a1-1942. Small Rivets, Under 7/16-Inch Diameter. Chemical composition, strength, ductility, and hardness tests for the rivet material, tables of standard dimensions and tolerances for the standard types, flat head, countersunk head, button-head, pan-head, and truss or wagon-box-head rivets.

American Society of Mechanical Engineers, Society of Automotive Engineers, sponsors. American Standards Assn., B 18g-1929, with 1942 Addendum, B 18g1-1942. Tinners', Coopers', and Belt Rivets. The types of small rivets covered by this standard are designated, respectively, as tinners', coopers', and belt. Recommendations concern proportions, tolerances, composition and physical properties of rivet material, physical tests of rivets, finish, and dimensions.

American Society for Testing Materials, A 31-40; 1940. A.S.M.E. Boiler Construction Code Specification SA-31. American Standards Assn., G28.1-1942. Boiler Rivet Steel and Rivets. For two Grades, based on tensile strength, to be used in boilers and other pressure vessels. Gives requirements for chemical composition, analysis, tensile and bending properties, test specimens, permissible variations in diameter, finish, and inspection; for rolled steel bars and rivets.

American Society for Testing Materials, A 152-39; 1939. Wrought-Iron Rivets and Rivet Rounds. Gives requirements for rolled bars; chemical composition, tensile and bending properties, micrographic examination, permissible variations in diameter; and for finished rivets, flattening, etch test, workmanship, and inspection.

American Society for Testing Materials, A 195-41; 1941. American Assn. of State Highway Officials, M 98-41. American Standards Assn., G42.1-1942. High-Strength Structural Rivet Steel. For use with structural silicon steel and equivalent steels; annealing, chemical composition, ladle analysis, tensile properties, upsetting test, test specimen, and permissible variations in size.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Rivet Steel and Rivets, M-110-40; 1940. Covers carbon steel bars for rivets and finished rivets for boilers, locomotive tanks and underframes, passenger and freight equipment cars. Requirements for chemical and physical properties of steel, bend and flattening tests, and tolerances for finished rivets.

Society of Automotive Engineers. Aeronautical Material Specification No.7225; 1940. Steel Rivets (Annealed). Gives requirements for composition, condition, quality, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.7228; 1940. Rivets; Corrosion-Resistant Steel. Gives requirements for composition, condition, quality, reports, and rejections.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn., B18.4-1937. Large Rivets. These rivets are designed for use in structural work of bridges, buildings, and in ship and boiler construction. Covers button- and high-button heads, flat- and round-top countersunk heads, cone- and pan-heads. Dimensions include the driven shapes of four of the six types of rivets, the corresponding hold-on and rivet-set impressions.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S.A.E. Recommended Practice for Split and Tubular Rivets, revised 1929. Gives diagrams and tables of sizes and dimensions for rivet caps, flat head, oval head, cupped countersunk-head, flat countersunk-head, and oval head split and tubular rivets.

U. S. Gov., Federal Specification FF-B-571a; 1934. Amendment 1; 1935. Bolts; Nuts; Studs; and Tap Rivets (and Material for Same). Includes one type of tap rivets. Gives general and detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 43B11c; 1936. Rivets, Tap; Bolts; Nuts; Studs (and Material for Same).

U. S. Gov., Navy Dept. Specification 43R1f; 1943. Rods, Rivet (and Rivets); Steel, for Hull Construction.

U. S. Gov., Navy Dept. Specification 43R2e; 1944. Rivets; Sheet-Metal-Work.

U. S. Gov., Navy Dept. Specification 43R3a; 1941. Rivets, (and Rods, Rivet); Boiler.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers; unfired pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for rivet iron and iron rivets—material, chemical composition, tensile properties, bend tests, test specimens, number of tests, micrographic tests, physical properties and tests, workmanship and finish, inspection, and rejection.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers; unfire pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for three grades of rivet steel—(A) and (B) low carbon and (C) chrome-manganese-silicon alloy-steel; and requirements for rivets—chemical composition, tensile and bending properties, test specimens, tests of finished rivets, permissible variations in diameter, workmanship, and finish.

U. S. Gov., Treasury Dept., Procurement Div., No.574; 1942. Rivets; Bifurcated. Covers—type I, truss head; and Type II, countersunk head. Gives requirements for material, finish, heads, diameter of shank, diameter of head, height of head, and length; methods of sampling and inspection; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.575; 1942. Rivets; Steel, Structural. Covers—type I, button head; II, high button head (acorn); III, cone head; IV, flat head; V, flat top countersunk head; VI, round top countersunk head; VII, pan head, 7/16-in. nominal diameter and smaller; VIII, pan head, 1/2-in. nominal diameter and larger; and IX, truss (wagon box) head. Gives requirements for material, measurement of lengths, fillets, manufacture, diameter of body, diameter of head, height of head, and length; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.582; 1942. Rivets, Belt, and Brake Band; and Burrs, Belt-Rivet. Covers two types—(I) belt rivets, and (II) brake band rivets. Gives requirements for material, finish, burrs, size, shank diameter, diameter under head, diameter of head, height of head, and overall length; methods of sampling and inspection; and packaging, packing, and marking.

References.—Alloy steel rivets, *see* 622.9; methods of test, general requirements for metals, *see* 600.1; noncorrosive coatings and tests, *see* 600.3; stock for steel and alloy steel rivets, *see* 603.21, 621.31.

608.5 PINS AND SHAFT KEYS

608.51 Pins, Cotter, Dowel, Rod End Pins, Etc.

Society of Automotive Engineers. Aeronautical Material Specification No.7210; 1940. Cotter Pins; Corrosion-Resistant Steel. Gives requirements for composition, condition, quality, shape, tolerance, sizes, reports, and rejections. Similar Specifications: Federal FF-P-386, Type C; Navy 42 P7, Type C; S.A.E. 30915.

Society of Automotive Engineers. Aeronautical Material Specification No.7212; 1942. Steel Cotter Pins; Galvanized, Low-Carbon. Gives requirements for composition, condition, quality, shape, tolerances, sizes, reports, and rejections. Similar Specifications: Navy 47P7, Type B; Federal FF-P-386, Type B; S.A.E. 1010.

Society of Automotive Engineers. Aeronautical Material Specification No.7213; 1943. Cotter Pins; Medium-Carbon, Steel-Zinc Plated. Gives requirements for chemical composition, condition, quality, shape, tolerances, sizes, reports, and rejections. Similar Specifications: Navy 42P7, Type B; Federal FF-P-386, Type B; S.A.E. 1040.

Society of Automotive Engineers. Aeronautical Standard 39; 1941. Stainless Steel Cotter Pins; Aircraft Engine. Diagrammatic dimensional drawings showing minimum eye and drill hole diameters of corrosion resistant steel (18 chromium—8 nickel) cotter pins 1/16 in. to 5/16 in. in diameter, .313 in. to 2.500 in. in length.

Society of Automotive Engineers. Aeronautical Standard 40; 1941. Dowel Pins; Aircraft Engine. Diagrammatic dimensional drawing of recommended fits for dowel pins 1/16 in. to 1/2 in. in diameter, .250 in. to 2.000 in. in length.

Society of Automotive Engineers. Aeronautical Standard 132; 1943. Pin-Taper. Gives diagram and table showing dimensions and tolerances for tapered pins.

Society of Automotive Engineers. Aeronautical Standard 133; 1943. Pin-Clevis. Gives diagram and table showing dimensions and tolerances for clevis pins.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Standard Cotter Pins, revised 1942. Gives diagram and table of sizes and dimensions.

U. S. Gov., Federal Specification FF-P-386a; 1943. Amendment 2; 1944. Pins; Cotter, Split. Covers four types—(A) brass, (B) carbon steel, (C) chromium-nickel corrosion-resisting steel, and (D) chromium corrosion-resisting steel. Gives requirements for material, workmanship, finish, temper, ductility, chemical composition, zinc coating, hardness, and sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 42P6b; 1937. Pins; Steel, Taper.

U. S. Gov., Navy Dept. Specification 42P7d; 1937. Pins; Cotter, Split.

U. S. Gov., Navy Dept. Specification 49T6b; 1939. Terminals; Tie-Rod, Threaded Clevis Type.

References.—Methods of testing general requirements for metals, *see* 600.1; bolt and rivet steel stock, *see* 603.21; rod ends and pins, automotive, *see* 722.33.

608.52 Shaft Keys

American Petroleum Institute, Div. of Production. Standard 4-A; 1939. Rig Iron Standards. Includes dimensional standards on four sizes of rig iron and on five sizes of sand reels. Rig Irons covered by this specification are for oil company purposes.

American Petroleum Institute, Div. of Production. Standard 7; 1944. Transmission Standards. For equipment and machinery used for drilling and production purposes in the oil industry. Applies to shafting and bored members, keys and keyways, and chains. Covers material, workmanship and finish, marking, shafting and keys basic standards, shafting and keys detailed dimensions, chain, inspection and rejection, and appendices.

American Society of Mechanical Engineers. Woodruff Keys, Keyslots, and Cutters. American Standards Assn., B17f-1930. Dimensions and tolerances for standard Woodruff keys, keyslots, and cutters, standard key numbers. For keys ranging from 1/16 by 1/2 in. long to 3/8 by 1 1/2 in. long. Tables give overall dimensions of keys, distance from center of circle forming the key profile to the top of the key, and overall dimensions with maximum and minimum limits for keyslots of the series established. For the two series of keyslot cutters adopted, overall dimensions and number of teeth for both fine and coarse series, tolerances, and general design features are given.

American Society of Mechanical Engineers. American Standards Assn., B 17.1-1943. Shafting and Stock Keys. Dimensions and Tolerances for Finished Steel Shafting, Parallel Stock Keys, and Taper Stock Keys. Covers finished shafting, plain parallel stock keys, plain and gib-head taper stock keys, and tolerances on key and shafting dimensions. Gives illustrative diagrams and tables showing dimensions and tolerances.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Woodruff Keys, adopted 1929. Diagrams and tables of dimensions and details for keys, key-slot, key above shaft, and keyways.

References.—Methods of testing general requirements for metals, *see* 600.1; shafts, *see* 611.52; cotter keys, *see* 608.51.

608.53 Studs

Society of Automotive Engineers. Aeronautical Recommended Practice, 142; 1943. Stud Fits and Tolerances (Steel in Aluminum or Magnesium Alloys). Gives sizes, number of threads, hole dimensions, standard stud dimensions, data, and diagrammatic drawings showing stud end oversize identifications.

608.6 WASHERS

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 70; 1942. Washer—Plain. Gives drawing with dimensions and notes. Developed by National Aircraft Standards Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 143; 1942. Washers—X-4130 or Equivalent, H.T. 125,000 to 145,000 PSI, Countersunk and Plain Type. Gives drawings with dimensions and notes. Developed by National Aircraft Standards Committee.

Edison Electric Institute. Suggestions for Specifications for Rolled Steel Washers, No. TD-10; 1940. Covers flat, round, and square rolled steel washers commonly used in overhead line construction. Gives requirements for material, kind, dimensions, galvanizing, packing and shipping, inspection, and rejection.

Plain Washer Manufacturers' Assn. Manufacturers Standard Plain Washers, 1938. This specification lists standard outside and hole diameters, thickness of metal, and estimated number per pound for various bolt diameters; and gives permissible tolerances. Also includes narrow rim plain washers, light steel washers, plain timber construction washers, riveting washers, small standard regular plain washers (for screws), round flat washers—steel, brass, malleable, square washers (round hole), malleable iron bevel washers (square outside), formed washers—countersunk type (steel-plain, nickel-plated, brass, etc.) hardened steel tension washers, cupped washers, lock washers—spring, and shakeproof types, and internal type—flat.

Society of Automotive Engineers. Aeronautical Material Specification No. 7240; 1940. Lock-washers. Gives requirements for form (plain helical steel), composition, condition, quality, finish, bend tests, and rejections. Similar to U. S. Gov., War Dept., Specification 25523.

Society of Automotive Engineers. Aeronautical Standard 36; 1941. Plain Washers; Aircraft Engine. Diagrammatic dimensional drawing of cadmium plate, deep drawing and low carbon steel washers No. 10 to 1 in. in size.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Standard Lock Washers—Carbon Steel, revised 1944. Gives diagram, use and application, washer section, finish, coiling, quality of finish, material and hardness, temper test, toughness test, and table showing sizes and dimensions.

Society of Automotive Engineers. 1944 Handbook, Section 5—Screws, Bolts, and Washers. S.A.E. Standard Plain Washers, revised 1931. Gives table showing sizes and dimensions.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-7a-1; 1944. Washers; Spring Lock.

U. S. Gov., Navy Dept. Specification 43 W 1e; 1944. Washers; Iron and Steel.

U. S. Gov., Navy Dept. Specification 43W2d; 1945. Washers; Brass.

U. S. Gov., Treasury Dept., Procurement Div., No. 307; 1938. Washers; Iron and Steel. Shall be of two types—round and square. Gives requirements for finishes, material, bolt size, hole size, outside dimension, thickness, and variations; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 414; 1940. Washers; Steel, Lock, Spring, Helical. Shall be of three classes—(A) light, (B) heavy, and (C) regular. Gives requirements for design, hardness, widths, thickness, inside diameter, and approximate weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Lock washers and nuts for ball bearings, *see* 766.2.

608.7 TURNBUCKLES

U. S. Gov., Army-Navy Aeronautical Specification AN-T-19a; 1943. Turnbuckles; Aircraft.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R71-28; 1928. Turnbuckles. This recommendation establishes a list of stock sizes of turnbuckles with and without stubs and with hook, eye, and jaw ends.

U. S. Gov., Federal Specification FF-T-791; 1936. Amendment 1; 1944. Turnbuckles. Covers three types—(I) open buckle, (II) pipe buckle, and (III) rigging buckle; and eight classes. Gives requirements for material, workmanship, size, length of head, thread, tensile strength, bend test, finish, galvanizing, manufacture, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 12T7b; 1942. Turnbuckles (Aircraft Use).

U. S. Gov., Navy Dept. Specification 12T11; 1944. Turnbuckles, for Wire Rope.

References.—Methods of testing, general requirements for metals, *see* 600.1; noncorrosive coatings, *see* 600.3; standard threads, *see* 608.0.

608.8 SNAPS AND FASTENERS

U. S. Gov., Army-Navy Aeronautical Specification AN-F-16; 1943. Fasteners; Interlocking Slide.

U. S. Gov., Navy Dept. Specification 27F10; 1941. Fasteners; Trousers (Catch-On).

608.9 MISCELLANEOUS MANUFACTURES

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1936. Specifications for Metal Details Used in Wood Bridges and Trestles. Gives requirements for wrought iron, steel, cast iron, cap-stringer straps, spikes, packing spools or separators, cast washers, wrought washers, and special castings.

U. S. Gov., Navy Dept. Specification 42G1e; 1945. Grommets and Grommet Rings.

U. S. Gov., Navy Dept. Specification 42 J 1b; 1944. Joints; Universal, for Use Other Than for Motorboat Shafting.

U. S. Gov., Treasury Dept., Procurement Div., No.543; 1942. Fasteners; Wood Joint, Corrugated. Covers two types—(I) divergent corrugations and (II) parallel corrugations; and two classes—(A) saw edge and (B) plain edge. Gives requirements for material, workmanship, length, thickness, width, and corrugations; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.568; 1942. Eyelets; Shoemakers'. Shall cover: Type I—visible; sizes 1, 2, and 3. Type II—invisible; sizes 1, 2, and 3. Base material shall be steel not less than 0.0075 in. in thickness and gives requirements for finish, hole diameter, color, and provision for setting; methods of sampling, inspection, and test; and packaging, packing, and marking.

610-619 IRON AND STEEL MANUFACTURES

611. CASTINGS AND FORGINGS

611.0 GENERAL ITEMS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Hull Castings and Machinery Castings. Include rules for inspection and tests.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Hull Forgings and Machinery Forgings. Include rules for inspection and tests.

American Iron and Steel Institute. Manufacturers' Standard Practice. Supplementary Information. Section—Forgings. Includes tables of standard forging allowances and rough turning allowances.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for castings.

American Society for Testing Materials, A196-42T; 1942. Tentative Definitions of Terms Relating to Cast Iron. Gives definitions for cast iron, pig iron, gray cast iron, white cast iron, mottled cast iron, malleable cast iron, and pearlitic malleable cast iron.

American Society for Testing Materials, A 247-41T; 1941. Tentative Recommended Practice for Evaluating the Microstructure of Graphite in Gray Iron. This procedure covers the classification of flake graphite in gray cast iron by comparison with two charts illustrating standard structures. Directions for the use of these charts and a procedure by which specimens of cast iron may be prepared so that the charts can be correctly used are presented. Selection of specimen, polishing, estimation of flake size with chart, use of calibrated oculars, recording graphite structure in gray iron, and recommended procedure for polishing microsections of cast iron. Prepared jointly by the American Foundrymen's Association and the American Society for Testing Materials.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cast Iron. Covers definition, constants, alloying, uses, and general specifications.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Steels. The steel compositions included in this standard are considered adequate for practically all parts made of ferrous materials that are necessary for the production of automotive apparatus and include grades that have been found commercially available and technically adequate for the service required of such parts. Includes general instructions, explanation of S.A.E. numbering system, chemical compositions, methods of sampling for check analysis, method of determining hardenability, grain size charts for classification of steel, magnaflux testing, determination of inclusions, general characteristics and heat treatments, tension test specimens, physical properties, hardness tests, and definition of heat treating terms.

611.1 GRAY IRON CASTINGS

611.11 Gray Cast Iron

American Gear Manufactruers Assn. Standard 242.01; 1944. Cast Iron Gear Blanks; Tentative. Covers purpose, scope, classes, material manufacture, chemical composition, heat treatment, general physical property, controlling section, tests, workmanship and finish, and inspection.

American Public Works Assn. Sewers, J1-38; 1938. Includes gray iron castings conforming to A.S.T.M. Specification A48 for manhole and wellhole frames, covers, inlet frames, traps, and other sewer appurtenances.

American Society for Testing Materials, A 48-41; 1941. A.S.M.E. Boiler Construction Code Specification SA-48. American Assn. of State Highway Officials, M-105-41. American Standards Assn., G25.1-1942. Gray Iron Castings. Applies to castings where strength is consideration; tensile strength classes, transverse test, test bars, test procedure, requirements as to chemical composition, and explanatory notes.

American Society for Testing Materials, A 126-42; 1942. Gray Iron Castings for Valves, Flanges, and Pipe Fittings. Covers regular, high-strength gray or semi-steels, and high-test regular or alloy composition. Requirements for chemical composition, tensile properties, transverse test, mold, test specimen, etc.

American Society for Testing Materials, A 159-41; 1941. S.A.E. Recommended Practice for Automotive Gray Iron Castings. Automotive Gray Iron Castings. Gives scope, melting practice, hardness, hardness test, transverse strength, transverse test, tension test, chemical composition, chemical analysis, workmanship and finish, machineability, inspection, and rejection.

American Society for Testing Materials, A 159-44T; 1944. Tentative Specifications for Automotive Gray Iron Castings. Gives scope, hardness, transverse strength, tensile strength, workmanship and finish, machineability, inspection, rejection, and appendix.

American Society for Testing Materials, A 190-44T; 1944. Tentative Specifications for Lightweight and Thin-Sectioned Gray Iron Castings. For castings in which appearance, machineability, and dimension tolerances are primary considerations, based on visual inspection of castings and testing for machineability, but not primarily for strength considerations. Gives sample castings, physical tests, hardness tests, machineability, chemical composition, workmanship and finish, inspection and rejection, and certification.

American Society for Testing Materials, A 278-44T; 1944. Tentative Specification for Gray Iron Castings for Pressure—Containing Parts for Temperatures Up to 650° F. Covers scope, manufacture, tensile strength classification, test bars, correlation of test bar and casting, molding and pouring test bars, tensile strength test procedure, number of tests, retests, chemical composition, workmanship and finish, marking, and inspection.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1939. Specification for Gray Iron Castings. This organization has adopted the current A.S.T.M. Specification A 48 for gray iron castings.

Hydraulic Institute. Material Specification for Gray Iron Castings, No. 110; 1939. This specification covers gray iron castings used in manufacture of pumping equipment, not of a corrosive-resistant type, nor modified by heat treatment. Covers only physical properties such as tensile strength and transverse loading requirements, which are equivalent to A.S.T.M. Specification A48. This specification closely parallels A.S.T.M. A48, except that the transverse test is made the basis of acceptance rather than the tensile test.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Recommended Practice for Automotive Gray Iron Castings, revised 1942. Includes general information and requirements for physical properties, compositions, and uses of plain and alloy cast irons. Practically conforms with American Society for Testing Materials Specification A 159-41.

U.S. Gov., Federal Specification QQ-I-652; 1939. Amendment 3; 1942. Iron, Gray; Castings. Covers 8 classes—20, 25, 30, 35, 40, 50, 60, and special. Gives requirements for quality, chemical composition, and physical requirements; methods of sampling, inspection, and tests; requirements for packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46I5c; 1941. Iron, Gray, High-Test (Semisteel); Castings.

U. S. Gov., Navy Dept. Specification 46I6c; 1940. Iron, Gray; Castings.

U. S. Gov., Navy Dept. Specification 46I9; 1940. Iron, Gray, Alloy; Castings, Scale-Resisting.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels, and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for three grades of gray iron for castings such as valve bodies, fittings, flanges, including parts to be assembled into valves, manufactured in advance and supplied for sale from stock—process, chemical compositions, tensile properties, mold, test specimens, tension test apparatus, records, workmanship, and finish. Insubstantial agreement with American Society for Testing Materials Standard Specification A126.

References.—Methods of testing, general requirements for metals, *see* 600.1; standard samples, *see* 611.0; other specifications for cast iron, *see* specifications of individual commodities made of cast iron.

611.12 Manhole and Conduit Castings

American Society of Civil Engineers and American Standards Assn., Telephone Group, co-sponsors. American Standards Assn., A35.1-1941. Manhole Frames and Covers for Sub-Surface Structures. Requirements on design, material, and dimensions.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification E-9Ye; 1943. Electrical Apparatus, Distributing Systems, and Wiring (Emergency Edition). Includes requirements for manhole covers and frames.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-459-D; 1934. Manhole Tops, Types MC-83 and MC-85; Handhole Lid, Type MC-86.

References.—Methods of testing, general requirements for metals, *see* 600.1; standard samples, *see* 611.0; other specifications for cast iron, *see* 611.11; masonry sewers, *see* 518.67.

611.13 Sluice Gates and Mooring Bitts

American Water Works Assn. Tentative Standard Specifications for Sluice Gates, 7F.2T-1941. Covers type and service, supplementary details, data to be furnished, size of waterway, basis of structural design, iron castings, bronze, bolts, studs and nuts, type of end connections, frames, disc, free rings or facings, wedging devices, guides, stems, wall guides and bearings, thrust bearings, operating mechanism, indicators, workmanship, painting, testing, inspection, and preparing for shipment.

References.—Methods of testing, general requirements for metals, *see* 600.1; standard samples of cast iron, *see* 611.0; specifications for gray cast iron, *see* 611.11; cast steel mooring bitt, *see* 611.49; cleats, cast-iron, for docks, *see* 611.49; bollards, for docks, *see* 611.49.

611.14 Floor Drains and Traps

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 4.21; 1938. Scuppers and Floor Drains. Gives requirements for the number needed for floors of various types and occupanies and includes descriptions of approved types of scuppers and floor drains.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures, (for) Land Use. Includes requirements for drain for floor and shower stall—of heavy cast iron, double drainage pattern, with seepage pan for embedding in floor construction, and with weep holes providing drainage from pan to drain pipe. For 2-, 3-, and 4-in. drain pipe. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

References.—Methods of testing, general requirements for metals, *see* 600.1; standard samples of cast iron, *see* 611.0; plumbing practice and fixtures, *see* 600.6, 617.7; specifications for gray cast iron, *see* 611.11; brass traps and drains, *see* 645.4.

611.15 Grates and Grate Bars

References.—House heating boilers, *see* 614.4; power boilers and accessories, *see* 703; locomotives and parts, *see* 701.3, 702.9.

611.16 Pulleys

Multiple V-Belt Drive Assn. Horsepower Ratings for Multiple V-Belt Drives, 1940. Gives formula for rating based on consideration of the effect of bending, relative stress in the belt, centrifugal force, and belt speed.

Multiple V-Belt Drive Assn. Standard Groove Dimensions for V-Belt Pulleys, 1940. Dimensional drawing and tolerances of pulleys for use with V-shaped belts. Prepared jointly by the Rubber Manufacturers Assn. and this association.

References.—Methods of testing, general requirements for metals, *see* 600.1; standard samples of cast iron, *see* 611.0; specifications for gray cast iron, *see* 611.11; paper pulleys, *see* 493; sash pulleys, *see* 617.5; awning pulleys, clothes line pulleys, etc., *see* 617.9, 766.0.

611.17 Heating and Cooking Vessels

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications No. 55. Griddles; Cast Iron.

U. S. Gov., Navy Dept. Specification 41K7; 194 Kettles; Pitch.

U. S. Gov., Navy Dept. Specification 64K5b; 1943. Kettles; Scouse.

References.—House heating boilers, *see* 614.4; stoves, *see* 614; power boilers, *see* 703.1; electric heating and cooking devices, *see* 717.1.

611.18 Cast-Iron Wheels

American Transit Assn. Standard Design for Tread and Flange of Wheel, E13-38; 1938. Dimensional drawings of tread and flange contours for steel and chilled iron wheels. Emergency Revision E13 (Em); 1942, changed requirements to meet demands of the present national emergency.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Flange Limit Gage for Remounting all Cast Iron and Cast Steel Wheels. Dimensional drawing for the fabrication of gage, finish requirements, and with diagrams showing method of use. Emergency Specification, 1942, changed requirements.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Limit Wear Gages for Condemning A.A.R. Wheel Gages. Dimensional diagram.

Assn. of American Railroads, Operating and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Master Gages for A.A.R. Wheel Gages. Recommended Practice. Master gage for checking tread worn hollow condemning limit gage for cast iron and cast steel wheels. Dimensional drawing.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Master Gages for A.A.R. Wheel Gages. Recommended Practice. Gives detailed dimensional drawings for fabrication and marking of master gages. For remounting cast iron and cast steel wheels. Dimensional drawing showing manufacture and giving finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Minimum Flange Thickness, Height, and Throat Radius Gage for New Cast Iron, One-Wear Wrought and Cast Steel Wheels. Dimensional drawing for gage with requirement that gaging surfaces be hardened and ground and chromium-plate finished.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-403-41; 1941. Wheels; Cast Iron, for Locomotives, Tenders, and Cars. Covers 33-in. cast iron wheels for four loadings. Give manufacture, chemical composition and tests, design, dimensions and weight, physical properties and tests, inspection, rejection, and rehearing, with dimensional drawings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheel Tread Worn Hollow Limit Gage for Remounting Cast Iron and Cast Steel Wheels. Dimensional drawing of gage. Harden and ground on all gaging surfaces. Chromium-plated finish.

Assn. of Manufacturers of Chilled Car Wheels. Manual of Inspection, 1939; revised 1944. Railway Car Wheels. To establish a uniformity of foundry practices which are deemed essential to the manufacture of wheels which will withstand all of the stresses imposed in service and insure long life to the wheels. Gives code of practice for pouring, annealing, and testing; standard forms; and recommended practice for molding and annealing.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; standard samples of cast iron, *see* 611.0; steel railway car wheels and tires, *see* 611.49, 611.53; wheel sizes for traveling cranes, *see* 744.1; specifications for cast iron, *see* 611.11.

611.19 Miscellaneous Manufactures of Gray Cast Iron

U. S. Gov., Navy Dept. Specification 18S10a; 1944. Sinkers; Sounding-Machines; Navigational.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-1110; 1940. Anchor; Cast Iron, Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-2191; 1940. Casting for Clamp, Cable, M-1.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-5521; 1940. Collar; Turkshead, Submarine Mine.

References.—Methods of testing, general requirements for metals, *see* 600.1; standard samples of cast iron, *see* 611.0; cast iron bath tubs, lavatories, and sinks, *see* 612.21, 612.23; C.I. boilers, radiators, water heaters, *see* 614.4; C.I. fittings for plumbing fixtures, *see* 617.73; C.I. door locks, bolts, catches, fasteners, etc., *see* 617; C.I. pipe and fittings, *see* 607.1; C.I. valves and hydrants, *see* 607.6; C.I. ship chocks or rope guides, *see* 725.41; C.I. lifting jacks, *see* 616.91; C.I. water meters, *see* 793.4; C.I. journal bearings, *see* 692.3; gray cast iron, *see* 611.11; C.I. journal boxes, *see* 611.22; C.I. brake shoes, *see* 611.43; C.I. sash weights, *see* 617.5; C.I. locomotive cylinders, *see* 702.1; C.I. fuel tanks for engines, *see* 956.2; C.I. fire hose fittings, *see* 974.2; C.I. fire hose racks, *see* 974.3; malleable cast iron, *see* 611.2; C.I. washers, *see* 608.6; C.I. evaporators, feed water heaters, separators, *see* 703.9; ship propeller hubs, studs, and fair-water caps, *see* 725.42; water filters, *see* 619.5.

611.2 MALLEABLE IRON CASTINGS

611.21 Malleable Cast Iron

American Society of Mechanical Engineers. Boiler Construction Code, 1940. Specifications for Malleable-Iron Castings (S-15). Identical with American Society for Testing Materials Specification A47-33, referred to below for grade No. 35,018 only.

American Society for Testing Materials, A 47-33; 1933. A.S.M.E. Boiler Construction Code Specification SA-47 (Grade No. 35018 Only). American Assn. of State Highway Officials, M 106-35. American Standards Assn., G48.1-1942. Malleable Iron Castings. Covers castings for railroad, motor vehicle, agricultural implement, and general machinery purposes. Includes tensile properties, special tests and test specimen, re-annealing, and permissible variations in dimensions. S.A.E. Standard for Malleable Iron Castings. Endorsed by American Foundrymen's Assn.

American Society for Testing Materials, A 197-39; 1939. A.S.M.E. Boiler Construction Code Specification SA-197. American Standards Assn., G 49.1-1942. Cupola Malleable Iron. For malleable castings. Gives certification, process, manufacture control and records, primary graphite, tensile properties, test specimens, workmanship and finish, and marking. Endorsed by the American Foundrymen's Assn.

American Society for Testing Materials, A 220-44T; 1944. Tentative Specifications for Pearlitic Malleable Iron Castings. Gives scope, process, tensile properties, test specimens, number of tests, reheat treatment, permissible variations in dimensions, workmanship, quality, markings, inspection, and rejection.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1935. Specification for Malleable Iron Castings. This organization has adopted the Current A.S.T.M. Specification A 47 for malleable iron castings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Malleable Iron Castings, M-402-39; 1939. By air furnace, open hearth, or electric furnace process, tension test, annealing test, toughness, workmanship, finish, and marking.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Malleable Iron Castings. Covers definition, characteristics and uses, specifications, general properties, uses, inspection, packing, and substitutes.

Society of Automotive Engineers. Aeronautical Material Specification No. 5310; 1944. Pearlitic Malleable Iron Castings. Gives requirements for condition, physical properties, quality, precautions, reports, identification, approval, and rejections. Similar Specification: Ordnance Dept., Specification AXS-623, Class D.

Society of Automotive Engineers. Aeronautical Material Specification No. 7310; 1941. Rings—Piston, Cast Iron. Gives requirements for composition, condition, hardness, quality, finish, elasticity, tension, circularity, light-tightness and periphery, flatness, dimensions and tolerances, marking, identification, rustproofing, drawings, approval, reports, and rejection. Similar specifications: Army 95-28107; Navy 49 R 3.

Society of Automotive Engineers. 1944 Handbook Section 3—Processed Materials. S.A.E. Standard Malleable Iron Castings, Revised 1935. Covers malleable iron castings for general automotive, agricultural implement, railroad, and general machinery purposes. Conforms to American Society for Testing Materials Specification A -47.

U. S. Gov., Federal Specification QQ-I-666a; 1944. Iron, Malleable; Castings. Covers one grade for each of three classes—A, B, and C. Gives requirements for manufacture, workmanship, tensile strength, yield point, and elongation; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46I8c; 1935 Iron, Malleable; Castings.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for two grades of malleable iron castings for pipe fittings, valves, manifolds, connections, and miscellaneous appliances for steam pressures not exceeding 250 lb. and temperatures not exceeding 450° F., process, tensile properties, test specimens, tests, re-annealing, workmanship and finish, marking, and inspection and rejection. In substantial agreement with American Society for Testing Materials Standard Specification A47.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for malleable iron castings such as flanges, pipe fittings, and valve parts, for pressures not exceeding 125 lb., temperatures not exceeding 450° F., and diameters not exceeding 4 in.—process, tensile properties, test specimens, workmanship, and finish. In substantial agreement with American Society for Testing Materials Standard Specification A197.

References.—Methods of testing, general requirements for metals, *see* 600.1; zinc coatings and tests, *see* 600.3; other specifications for malleable cast iron, *see* specifications for the individual commodities made of malleable cast iron.

611.22 Journal Boxes

American Transit Assn. Recommended Practice of Limits of Wear, E125-39; 1939. Recommends limits of wear for car journals, journal boxes and bearings, axles, flanges, etc. Emergency Revision E125 (Em); 1942, changed requirements to meet demands of the present national emergency.

American Transit Assn. Standard Journal Boxes and Contained Parts, E2-34; 1934. Standard designs and dimensions for journal boxes, bearings and wedges, and dust guards, for seven sizes of bearings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Condemning Limits for Journal Box Wedges. Dimensional diagram for contour of back, of journal wedge variation, with details for use.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Design Dimensions for Integral Journal Boxes A, B, C, D, E, and F. Recommended Practice. Dimensional drawing with variations for size of journal, tolerance, and manufacturer's foundry.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Design Dimensions for Separable Pedestal Journal Boxes C, D, and E. Revised, 1943. Gives dimensional drawings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1943. Design Dimensions for Separable Bolted Journal Boxes C, D, E, and F Standard. Gives variations of dimensional drawing for size of journal, from either malleable iron, cast steel, or cast iron.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Driving Boxes and Engine Truck Boxes. Dimensional drawings of recommended designs for various sizes of journals.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Dust Guards for Journal Boxes A, B, C, D, E, and F. Dimensional drawing.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Flat Face Pedestal for Journal Boxes. Recommended Practice, 1931. Dimensional drawing for cast steel pedestal.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Journal Bearing Wedges. Dimensional drawing of wedge, with variations for size of journal, and tolerance.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1939. Journal Box Bolt Hole Gage. Gives dimensional drawings for four sizes of gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Journal Box Dust Guard Opening Gage. Dimensional drawing for five sizes of journals.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1939. Journal Box Lid Lug and Face Gage. Gives detailed dimensional drawings of gages for A and B and for C, D, E, and F boxes; also for journal box wedge and brass stop lug gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1939. Journal Box Lid Lug and Face Gage for Alternate Hinge Lug. Covers dimensional drawing of two sizes of gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1940. Journal Box Pedestal Fit Gage. Gives dimensional drawing for two sizes of gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942 Journal Boxes; Standard Method of Packing. Gives requirements for preparation of new packing, preparation of renovated packing, application of packing, body of packing, and cleaning and applying bearings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-120-42; 1942. Journal Box Lids. For use on B, C, D, E, and F journal boxes; lids made from cast steel, malleable iron, or pressed steel. Gives requirements as to construction, lid fastenings, dust tightness, with dimensional diagram.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-903-42; 1942. Dust Guards. Covers the general requirements to exclude dust from journal box and retain oil. Gives material, manufacture, dimensions, permissible variations, inspection, rejection, and rehearing.

References.—Methods of testing, general requirements for metals, *see* 600.1; malleable cast iron, *see* 611.21; bearings and bearing metals, *see* 692; classification of railway materials, *see* 600.2.

611.23 Rowlocks

611.29 Miscellaneous Manufactures of Malleable Cast Iron

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Malleable iron castings referred to in this specification shall conform to the current Specification A-47 for Malleable Castings of the American Society for Testing Materials.

References.—Malleable cast iron, *see* 611.21; methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; zinc coatings and tests, *see* 600.3; malleable iron pipe and fittings, *see* 607.2; M.I. brake beams and parts, *see* 611.42; M.I. stake pockets for flat cars, *see* 726.2; trolley pull-overs and line suspensions of malleable iron, *see* 719.63; pole brackets for trolley wire supports, of malleable iron, *see* 719.63; M.I. tie plates, *see* 606.2; M.I. driving point, *see* 719.62; M.I. hand drills, *see* 615.12; M.I. lifting jacks, *see* 616.91; M.I. spoke shaves, *see* 616.16; M.I. pipe cutters, *see* 615.39.

611.3 WROUGHT-IRON FORGINGS

American Society for Testing Materials, A 73-39; 1939. Wrought-Iron Rolled or Forged Blooms and Forgings. Includes two classes—for locomotives and railroad cars and for miscellaneous uses. Requirements for manufacture, chemical compositions, tensile properties, etch test, test specimen, workmanship, and inspection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Forgings. Covers definition, characteristics, classes of forgings, forgable metals, and commercial forging practice.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Iron; Wrought. Covers definition, derivation, constants, uses, forms, and substitutes.

References.—Methods of testing, general requirements for metals, *see* 600.1; zinc coatings and tests, *see* 600.3; wrought-iron bars and rods, *see* 603.1; W.I. plates, *see* 604.14; W.I. chains, *see* 603.51, 603.52, 603.54; W.I. pipe and fittings, *see* 607.3; W.I. tie plates, *see* 606.2; W.I. stake pockets for flat cars, *see* 726.2; W.I. truck bolsters and coupler yokes for freight cars, *see* 611.49.

611.4 STEEL CASTINGS

611.40 General Items

611.41 Cast Steel

American Public Works Assn. Sewers, J1-38; 1938. Includes steel castings for manhole frames and covers and for other sewer appurtenances conforming to the A.S.T.M. Specification A27 for carbon-steel castings for miscellaneous industrial uses.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Movable Railway Bridges. Covers requirements for cast steel—materials and tests.

American Society of Mechanical Engineers. Boiler Construction Code, 1940. Specifications for Carbon-Steel Castings (S-11). Identical with American Society for Testing Materials Specification A27. Cover grades A-2, A-3, B, B-1, and B-2, only.

American Society for Testing Materials, A 27-44; 1944. American Assn. of State Highway Officials, M103. A.S.M.E. Boiler Construction Code Specification SA-27. American Standards Assn., G50.1-1944. Carbon-Steel Castings for Miscellaneous Industrial Uses. Covers ten grades for industrial use, as distinguished from railroad and high-temperature applications. Gives heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, magnetic particle testing, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 27; 1942; affected section 3 (d), Heat Treatment; section 5, Chemical Composition, and section 8 (a), Tensile Properties.

American Society for Testing Materials, A 87-44; 1944. Carbon-Steel and Alloy-Steel Castings for Railroads. Four grades intended for locomotive and car equipment. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, alternate tests to destruction, magnetic particle testing, test specimens, number of tests, retest, permissible variations in weight, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 87; 1942; affected section 3 (d), Full Annealing; and section 10 (a), Magnetic Particle Testing.

American Society for Testing Materials, A 95-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-95. American Standards Assn., G17.1-1944. Carbon-Steel Castings for Valves, Flanges, and Fittings for High-Temperature Service. For pressure containing parts for high temperature service. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, hydrostatic tests, magnetic particle testing, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 95; 1944; affected section 5, Chemical Composition; section 8, Tensile Properties; and section 10, Hydrostatic Tests.

American Society for Testing Materials, A 215-44; 1944. American Standards Assn., G51.1-1944. Carbon-Steel Castings Suitable for Fusion Welding for Miscellaneous Industrial Uses. Quality suitable for fusion either by a field welding process or in the construction of weldments made up of cast steel or cast steel in combination with wrought steel members. Covers eight grades, with requirements for process, heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, magnetic particle testing, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 215; 1942; affected section 1 (b), Number of Grades; section 3, Heat Treatment; section 5, Chemical Composition; table I, Chemical Requirements; and table II, Tensile Requirements.

American Society for Testing Materials, A 216-44T; 1944. A.S.M.E. Boiler Construction Code Specification SA-216. Tentative Specification for Carbon-Steel Castings Suitable for Fusion Welding for Service at Temperatures Up to 850° F. For valves, flanges, fittings, or other pressure containing parts. In two grades, with requirements for heat treatments, temperature control, chemical composition, analyses, tensile and bending properties, hydrostatic tests, magnetic particle testing, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 216a; 1944; affected section I, Number of Grades; section 5, Chemical Composition; section 8, Tensile Properties; section 10, Hydrostatic Tests; and section 16, Finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-201-42, changed AAR Specification M-201-36, Steel Castings; section III, Physical Properties and Tests; paragraph 9 (a), Test Specimens.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Steel Castings, M-201-36; 1936. Grade A, unannealed and annealed for special uses; grade B, for highly stressed members; and grade C, as called for. Manufacture, requirements as to chemical and physical properties and tests, workmanship, marking, and variation in weight.

Hydraulic Institute. Material Specification for Carbon and Alloy Steel Castings, No. 120; 1939. These specifications cover steel castings used in the manufacture of pumping equipment; five grades—one carbon and four alloy. Gives requirements for manufacture, chemical composition, coupons, heat treatment, physical properties and tests, impact properties and tests, pattern equipment, workmanship, welding, and hydrostatic tests.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Steel; Cast. Covers definition, characteristics and uses, grades, specifications, and packing.

U. S. Gov., Federal Specification QQ-S-681b; 1941. Steel; Castings. Covers six classes—(x) common, no heat treatment, no physical tests; (o) common, annealed, no physical tests; (1) soft, annealed, tested; (2) medium, annealed, normalized, or normalized and tempered, tested; (3) hard, annealed, tested; and (4) to meet physical requirements as follows: 4A1 and 4A2—annealed; 4B1, 4B2, and 4B3—either annealed, normalized, or normalized and tempered; and 4C1, 4C2, 4C3, and 4C4—either annealed, normalized, normalized and tempered, or quenched and tempered. Gives requirements for material, workmanship, cleaning, repair of defects by welding, heat treatment, cleaning, marking, chemical requirements, and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 49S1k; 1939. Steel Castings.

References.—Alloy steel castings, *see* 622.5; methods of testing, general requirements for metals, *see* 600.1; classification of metals, *see* 600.2; heat treatment of castings, *see* 600.5; zinc coatings and tests, *see* 600.3; test machine for castings, *see* 611.40; other specifications for cast steel, *see* specifications for individual commodities made of cast steel.

611.42 Railway Brake Beams

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Bottom Rod and Brake Beam Safety Support for Four Wheel Freight Car Trucks. Recommended Practice, adopted 1932. Covers design for minimum clearance with detailed drawings of four arrangements of parts.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brake Beams. Strut for No. 15 Brake Beam. Dimensional drawing of strut with marking.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brake Beam Gages for Standard No. 15 Brake Beam. Dimensional drawings and use of brake beam gage, "go" gage for brake head, "go" and "no go" gage for brake head, channel opening gage for head and strut, strut keyway gage, strut pin hole gage, angle gage for strut, channel gage, "go" gage for brake shoe, "no go" gage for brake shoe, and gages for reworked and reclaimed brake beams.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brake Beam Hangers and Attachments. Covers detail drawings of various hanger pins, hangers, and hair-pin cotter.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brake Beam Specifications and Tests. Covers all complete brake beams A.A.R. equipment cars, manufacture, physical properties and tests, permissible variations, workmanship, and marking. Includes dimensional drawings of limiting outline, complete brake beam, compression and tension members, and head for No. 15 brake beam.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brake Levers, Rods, Connections, and Pins for Conventional Passenger Equipment Cars Foundation Brake Gear. Design fundamentals for braking force and recommended practice for maximum pressure, stress, shear, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brake Shoe Key. Dimensional drawing and minimum weight of steel (structural grade) key.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specifications for Repairs to Freight Equipment Brake Beams. Standard, revised 1942. Used brake beams applied to foreign freight cars.

Gives requirements for dismantling, inspection and reconditioning of dismantled parts, assembling, testing, marking, and gages. Dimensional diagrams.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; heat treatment of castings, *see* 600.5; testing machine, *see* 611.40; cast steel, *see* 611.41; malleable cast iron, *see* 611.21.

611.43 Railway Brake Shoes, Cast Steel and Cast Iron

American Transit Assn. Standard Design of Brake Shoes, Brake Shoe Heads, Brake Shoe Keys and Gauges, E1-35; 1935. Dimensional drawings of brake shoes and parts and their gauges for wheels of various diameters, tread widths, and contours.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Brake Shoes. Specifications M-401-44; 1944. For brake shoes for passenger and freight car equipment. Gives manufacture, physical properties and tests, workmanship and finish, marking, and inspection and rejection.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; standard samples of cast iron; *see* 611.0; gray cast iron, *see* 611.11.

611.44 Railway Couplers, Cast Steel and Forged steel

American Transit Assn. Recommended Specification for Automatic Couplers for Interurban Cars and Radial Draft Rigging, E100-37; 1937. Gives detailed information concerning the manufacture, placement, and operation of couplers, and also requirements as to the quality of steel to be used.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. A.A.R. Alternate Standard Tight Lock Coupler for Passenger Equipment Cars. Detail drawing of coupler and parts.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. A.A.R. Type "D" Coupler—Top Lock Lifter No.3 Design. For replacement of Nos.1 and 2 designs; detail of changed part. Includes direction for building up metal of No.2 to reclaim to No.3 form.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. A.A.R. Type "D" Coupler—Top Lock Lifter Gage for No.3 Design of Top Lock Lifter. Dimensional drawing of gage, including design for reclaiming No.2 top lock lifters to No.3.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Cast Steel Yoke Head for Use With Odd-Length Gear Pockets. Dimensional diagram of construction. Details for various sizes of coupler shanks.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Couplers; Uncoupling Arrangement for. Instructions for arrangement of uncoupling device, locations, etc., for passenger and freight car equipment.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Couplers; Height of. Maximum and minimum heights for drawbars, freight and passenger cars, standard, narrow, and 2-ft. gage track. Instructions for adjusting height of coupler, including metal shims, and where use of liner is permissible.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Coupler Knuckle Pivot Pins and Swivel Pins for Swivel Shank Coupler, M-118-42; 1942. Pins and steel bars for making pins, composition, analysis, drop and hardness tests, tolerance, and marking.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Coupler Limit Gage. Covers dimensional and marking of gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Coupler Yokes. Not a substitute for A.A.R. standard keyed yokes. Dimensional drawings for twin spring gear, tandem spring gear, and friction spring gear yokes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Coupler Yokes; Cast Steel. Vertical plane yokes; standard and alternate standard; dimensional drawings. Also for horizontal yoke.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Coupler Yokes; Forged Steel—Two Key. Dimensional diagram of construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Coupler Yokes, M-205-38; 1938. Design test requirements for freight equipment coupler yokes, horizontal or vertical plane type. Material by A.A.R. specifications, design for use with type "E" coupler, test requirements for breaking load, deflection measurements, and loading diagram for measuring test requirements.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Drop Test Machine for A.A.R. Couplers and Axles. Detailed drawings of apparatus, including jerk test, striking test, fact test, knuckle pin test, and separate knuckle test set-ups.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Gages 1, 2, 3, 4, and 5 for Coupler and Yoke. Detailed dimensional drawings for gages.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Gage for Checking A.A.R. Standard "E" and Type "D" Coupler Swivel Shanks After Reclamation. Dimensional drawing of gage and note for use on reclaimed coupler.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Knuckle Nose Wear and Stretch Limit Gage No.24992-A. Dimensional drawing to be marked with letter "A" to indicate latest type.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Knuckle Pins. Fifteen detail drawings of various types of steel pins, including oversize.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Purchase and Acceptance of A.A.R. Standard "E" Couplers, Knuckles, Locks, and Other Parts, M-204-39; 1939. Covers grade B and high tensile cast steel for complete couplers and repair parts. Gives requirements for manufacture, chemical properties and tests, physical tests, variations in weight and gaging practice, limiting weight table, gages to insure interchangeability of parts, workmanship, and marking diagrams.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Purchase and Acceptance of A.A.R. Tight Lock Couplers and Coupler Parts, Radial Connections, Yokes, and Attachment Parts, M-206-40; 1940. Specifications for manufacture chemical and physical properties and tests, variations in weight-gaging practice, table of limiting weights, list of gages, workmanship, shank, yoke and radial connection pins, and bushings with detail illustrations.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Rotary Bottom Operated Uncoupling Rods for Type "E" Couplers. Diagrams illustrating designs for, and the application to, couplers.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification for Secondhand Couplers for Repairs to Freight Equipment. For application to cars in interchange service, inspection, gaging, marking, and painting; with an appendix covering coupler reclamation practice, coupler bodies, knuckles, locks, knuckle pivot pins, top lock lifters, etc. Detailed diagrams for restoring worn parts, use of reclamation gages, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Standard "E" Coupler. Covers dimensional drawings for 5 by 7 in. shank, 6 1/4 by 8 in. shank, details of bushings, coupler parts, No. 10-A contour, and pivot pin hole.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Type "E" Pilot Couplers. Gives detailed drawings for 6 by 6-in. shank for repairs only, 6 by 7 1/2 in. shank for repairs only, 6 by 8-in. shank for new equipment and repairs, and includes support of coupler with three shank sizes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Uncoupling Rigging for Type "E" Passenger Couplers. Two types of rigging, for replacement where existing operating rods are used, and for new cars or where new rods are installed. Dimensional drawing of rigging.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Uncoupling Rods for Tight Lock Couplers. Dimensional drawings for types 3, 4, and 5 mechanisms.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheel Defect, Worn Coupler Limit, Worn Journal Collar, and Journal Fillet Gage. Dimensional drawing of gage to be used for gaging knuckle opening for MCB contour (1904) couplers only. Harden and ground on all gaging surfaces. Chromium-plated finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Worn Coupler Limit Gage for Types D and E Couplers. Dimensional drawing for fabrication of gage and diagram of use.

References.—Methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; heat treatment of castings, *see* 600.5; coupler yokes, *see* 611.49; testing machine for castings, *see* 611.40; cast steel, *see* 611.41.

611.49 Miscellaneous Manufactures of Cast Steel

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Anchors. Includes rules for inspection and tests.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Design Dimensions for Brake Hanger Bracket. Recommended Practice, adopted 1937. Dimensional drawing of bracket.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Design Dimension and Tolerances for Cast Steel Side Frames. Dimensional drawing for 40, 50, and 70 ton capacity.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Design Dimensions and Tolerances for Truck Bolsters. Dimensional drawing and tolerances for 40, 50, and 70 ton capacity.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Hopper Door Operating Shaft; End for. Dimensional drawing of detail.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Side Frame and Bolster Marking. Recommended Practice. Specification for information to be marked on side frame and truck bolster.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Side Frame Spring Seat Gage. Recommended Practice, revised 1939. Two sizes for 40 and 50 ton, and for 70 ton gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Miscellaneous Truck Standard and Recommended Practice. Distance between backs of flanges, height of flange, wheel diameters, designation of axles, journal boxes and parts by letter, and trucks by number of axles.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Truck Side Frames, Cast Steel, M-203-38; 1938. For freight equipment with integral or with separable journal boxes. Requirements for material based on A.A.R. specification, detailed loading diagrams, deflection tests for vertical and transverse loading, four sizes of truck.

U. S. Gov., Navy Dept. Specification 6A2a; 1913. Anchors; Stockless.

U. S. Gov., Navy Dept. Specification 6A3b; 1941. Anchors; Boat.

U. S. Gov., Navy Dept. Specification 6A4c; 1941. Anchors; Steel, Navy Type or Stocked.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for steel castings for valves, flanges, fittings, or other pressure containing parts of carbon-steel for service temperatures up to and including 850° F. and carbon-molybdenum alloy steel for service temperatures to 1,000° F.—process, heat treatment, chemical compositions, tensile properties, bending properties, tests, re-tests, workmanship, and finish.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-66; 1939. Casting; Steel for Guns, Centrifugally Cast.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-1900; 1940. Box; Distribution, M2, Submarine Mine.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-80; 1936. Spur; M-1911, Pairs.

References.—Alloy steel castings, *see* 622.5; methods of testing, general requirements for metals, *see* 600.1; classification of railway materials, *see* 600.2; zinc coatings and test, *see* 600.3; heat treatments, *see* 600.5; cast steel stake pockets for flat cars, *see* 726.2; cast steel chain, *see* 603.53; cast steel pipe fittings, *see* 607.4; cast steel valves, *see* 607.6; cast steel journal boxes, *see* 611.22; locomotive crossheads, cylinder heads, piston heads, of cast steel, *see* 702.9; railroad frogs, crossings, switches, and special trackwork of cast steel, *see* 606.3; cast steel fire hose racks, *see* 974.3: cast steel ship chocks or rope guides, *see* 725.41; cast steel lifting jacks, *see* 616.91; cast steel, *see* 611.41; testing machine for castings, *see* 611.40; wheel sizes for travelling cranes, *see* 744.1.

611.5 STEEL FORGINGS

611.50 General Items

American Gear Manufacturers Assn. Standard 110.01; 1944. Terms Used in Designating Gear Tooth Wear and Failure; Tentative. Covers introduction, normal wear, initial pitting, progressive pitting, abrasion, scratching, scoring, galling, burning, rolling and peening, cracking and checking, chipping, gouging, overload and breakage, and fatique and breakage.

American Gear Manufacturers Assn. Standard 222.01; 1944. Beam Strength of Straight Bevel and Spiral Bevel Gears. Covers beam strength rating, durability rating, and gives table 1 for tooth form factor of spiral bevel gears and table 2 for tooth form factor of straight bevel gears.

American Gear Manufacturers Assn. Standard 211.01; 1944. Surface Durability of Helical and Herringbone Gears. Covers external gears, internal gears, alternate method for determination, beam strength rating, and figures giving face width, ratio of gears to pinion, and variation of Ds factor with pinion diameter and speed.

American Gear Manufacturers Assn. Standard 212.01; 1944. Surface Durability of Straight Bevel and Spiral Bevel Gears. Covers surface durability, beam strength rating, table showing hardness values, and figure showing variation of Db factor with pinion diameter and speed.

Drop Forging Assn. Standard Tolerances for Forgings (for Forgings Under 100 Pounds Each), 1937. Gives special and regular tolerances, dividing regular into commercial and close standard classes for thickness, width, draft angle, quantity, fillets, and corners; with tables of tolerances for various weights of forgings for both classes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Forgings. Covers definition, characteristics, classes of forgings, forgeable metals, and commercial forging practice.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-102-1; 1924. Forging, for Recoil Mechanisms, General.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-103A; 1936. Forging; Gun, for U. S. Army and Navy.

611.51 Forged Steel

American Iron and Steel Institute. Steel Products Manual, Section 3; 1943. Hot Rolled Rounds and Round Cornered Squares for Forged Shell. Steel for forged shell is defined as hot rolled steel suitable for hot forging and subsequent machining into shell bodies. Covers standard sections, definitions, and standard permissible variations.

American Iron and Steel Institute. Steel Products Manual, Section 22; 1939. Revised, 1943. Forged Axles and Locomotive Forgings. Covers forgings used principally for locomotives and cars for steam and electric railways and also for industrial railway equipment. Manufacturing practices, chemical requirements and tests, physical properties and tests, workmanship and finish, permissible variations and weights, marking and storing, inspection, rejection, and rehearing.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Movable Railway Bridges. Covers requirements for forged steel and annealed forged steel—chemical properties, analyses, physical properties, tests, annealing, and selecting specimens.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Steel Railway Bridges (for Fixed Spans Not Exceeding 400 Feet in Length). Covers requirements for steel for forgings—process, discard, prolongations for tests, annealing, chemical composition, ladle and check analyses, physical properties, yield point, tension test specimens, number of tests, retests, finish, identification marks, inspection, and rejection.

American Society of Mechanical Engineers. Boiler Construction Code, 1940. Specifications for Seamless Steel Drum Forgings (S-4). Includes three grades of carbon-steel hollow forged drums for use in boilers and for other pressure vessels. Grades 1 and 2 are suitable for fusion welding and grade 3 is not to be welded. Requirements as to material, chemical composition, heat treatment, bend tests, test specimen, and permissible variations.

American Society of Mechanical Engineers. Boiler Construction Code, 1940. Specifications for Carbon-Steel and Alloy-Steel Forgings (S-10). Covers 13 classes of steels for structural and machine forgings. Gives requirements as to heat treatment, chemical composition, various tensile properties, test specimen, workmanship, and marking.

American Society for Testing Materials, A 235-42; 1942. American Assn. of State Highway Officials, M102. Carbon-Steel Forgings for General Industrial Use. Covers untreated, annealed, normalized, normalized and tempered, double normalized and tempered, and quenched and tempered forgings; in nine classes, for soft-steel, structural, ship fittings, bridges, machinery, shafts, axles, etc. Requirements for test specimen, boring and turning, heat treatments, chemical compositions, tensile properties, workmanship, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 235; 1943; affected section 7, Chemical Composition; table I, Tensile Requirements.

American Society for Testing Materials, A 236-42; 1942. Carbon-Steel Forgings for Locomotives and Cars. Covers untreated, annealed, normalized, normalized and tempered, special normalized and tempered, and quenched and tempered forgings in nine classes. Gives requirements for heat treatment, chemical composition, boring and turning, tensile properties, test specimen, microscopic test, workmanship, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 236a; 1943; affected section 1, Scope, table 1, Chemical Requirements; section 7, Chemical Composition; section 9, Check; table II, Tensile Strength; and section 10, Tensile Properties.

American Society for Testing Materials, A 237-42; 1942. Alloy-Steel Forgings for General Industrial Use. Covers annealed, normalized and tempered, and normalized, quenched, and tempered forgings in six classes; requirements as to heat treatment, chemical composition, tensile properties, boring and turning, bending properties, test specimens, and workmanship. A.S.T.M. Emergency Alternate Provision EA-A 237; 1943, affected table I, Tensile Requirements.

American Society for Testing Materials, A 238-42; 1942. Alloy-Steel Forgings for Locomotives and Cars. Includes three classes normalized and tempered, and three classes normalized, quenched, and tempered. Gives requirements as to heat treatment, chemical composition, boring and turning, tensile and bending properties, test specimens, microscopic and macroscopic tests for grain structure, workmanship, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 238; 1942; affected section 7, Chemical Composition; and section 14, Omit Macroscopic Examination.

American Society for Testing Materials, A 266-44T; 1944. A.S.M.E. Boiler Construction Code Specification SA-266. Tentative Specifications for Carbon-Steel Seamless Drum Forgings. Covers three grades of carbon-steel hollow drums and headers for use in boilers and for other pressure vessels. Gives requirements for process, special requirements, manufacture, machining, heat treatment, chemical composition, analysis, tensile and bending properties, test specimens, tests, workmanship, finish, marking, inspection, and rejection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-102-42, changed A.A.R. Specification M-102-41, Forgings, Carbon Steel, Annealed and Unannealed; paragraph 1, Scope; section II, Chemical Properties and Tests; paragraph 7, Chemical Composition; and section III, Physical Properties and Tests; paragraph 13, Microscopic Tests.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-102-41; 1941. Forgings; Carbon Steel, Annealed and Unannealed. Covers three grades of carbon steel forgings. Gives manufacture, physical and chemical properties and tests, workmanship and finish, marking, inspection, rejection, and rehearing.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-105-42. Blooms, Billets, and Slabs for Forgings. Covered by American Society for Testing Materials Tentative Specification A248-41T for Carbon-Steel and Alloy-Steel Blooms, Billets, and Slabs for Forgings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-105-41; 1941. Blooms, Billets, and Slabs for Forgings. Covers carbon, carbon-vanadium, and low-carbon-nickel steel. Gives method of manufacture, chemical properties and tests, workmanship and finish, marking, inspection, rejection, and rehearing.

Society of Automotive Engineers. Aeronautical Material Specification 5060A; 1942. Carbon Steel (.13-.18 Carbon). For bars, billets, forgings, tubing, or as ordered. Gives requirements for composition, condition, quality, reports, shipments, identification, and rejections. Similar Specifications: Navy 46 S 32, class A; S.A.E. 1015.

Society of Automotive Engineers. Aeronautical Material Specification No.5070; 1942. Carbon Steel (.18-.23

Carbon). For bars, rods, billets, or forgings. Covers requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections. Similar Specifications: AN-QQ-S-646, number X1020; S.A.E. 1022.

Society of Automotive Engineers. Aeronautical Material Specification No.5080; 1942. Carbon Steel (.32-.38 Carbon). For bars, billets, forgings, or as ordered. Covers requirements for composition, condition, quality, tolerances, reports, identification, and rejections. Similar Specification: S.A.E. 1035.

U. S. Gov., Navy Dept. Specification 49S21; 1939. Steel; Forgings and Bars for Hulls, Engines, and Ordnance (Heat Treated).

U. S. Gov., Navy Dept. Specification 46S29c; 1944. Steel; Forgings for Welding.

U. S. Gov., Navy Dept. Specification 46 S 30b; 1943. Steel; Forgings for Nitriding and Nitrided Steel.

U. S. Gov., Treasury Dept., Procurement Div. No.297; 1938. Steel; Carbon, Hot-Rolled or Forged. Covers eight classes of steel made by the open-hearth, electric, or crucible process. Gives requirements for physical properties and chemical composition; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-102; 1923. Forging, Steel; Heavy, Carbon and Alloy.

References.—Alloy steel forgings, *see* 622.6; methods of testing, general requirements for metals, *see* 600.1, 611.50; classification of metals, *see* 600.2; heat treatments, *see* 600.5; testing machine for forgings, *see* 611.50; other specifications for forged steel, *see* specifications of individual commodities made of forged steel.

611.52 Axles, Shafts, and Similar Forgings

American Iron and Steel Institute. Steel Products Manual, Section 22; 1939. Revised, 1943. Forged Axles and Locomotive Forgings. Covers forgings used principally for locomotives and cars for steam and electric railways and also for industrial railway equipment. Manufacturing practices, chemical requirements and tests, physical properties and tests, workmanship and finish, permissible variations and weights, marking and storing, inspection, rejection, and rehearing.

American Petroleum Institute, Div. of Production. Standard 4-A; 1939. Rig Iron Standards. Includes dimensional standards on four sizes of rig iron and on five sizes of sand reels. Rig irons covered by this specification are for oil company purposes.

American Petroleum Institute, Div. of Production. Standard 7; 1944. Transmission Standards. For equipment and machinery used for drilling and production purposes in the oil industry. Applies to shafting and bored members, keys and keyways, and chains. Covers material, workmanship and finish, marking, shafting and keys basic standards, shafting and keys detailed dimensions, chain, inspection and rejection, and appendices.

American Society of Mechanical Engineers. Approved as American Tentative Standard by American Standards Assn. as B17c-1927. Code of Design of Transmission Shafting. Rational Formulas and Diagrams for Computing shaft Diameters for All Conditions of Loading. Designing formulas for the cases most frequently met in design of transmission shafting, diagrams for use in designing shafting, various stress conditions that may be set up in the shaft, theories of elastic failure, application, and limitation. Recommended working stresses, shock, and fatigue factors; and maximum permissible working stresses.

American Society of Mechanical Engineers. American Standards Assn., B 17.1-1943. Shafting and Stock Keys. Dimensions and Tolerances for Finished Steel Shafting, Parallel Stock Keys, and Taper Stock Keys. Covers finished shafting, plain parallel stock keys, plain, and gib-head taper stock keys, and tolerances on key and shafting dimensions. Gives illustrative diagrams and tables showing dimensions and tolerances.

American Society of Mechanical Engineers. American Standards Assn., B 49-1932. Shaft Couplings; Integrally Forged Flange Type for Hydro-Electric Units. These dimensions apply to large integrally forged shaft couplings such as used for connection between generator and turbine in hydro-electric installations. Tables relate to coupling dimensions, drilling layout, and bolt dimensions. Other data given cover flange dimensions, formulas, drilling, and reaming for bolts.

American Society for Testing Materials, A 21-36; 1936. Carbon-Steel Axles for Cars and Tenders. Covers tapered axles not over 6 1/2-in. diameter; requirements for chemical composition, ladle analysis, drop test, permissible variations in dimensions, weights, workmanship, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 21; 1942, affected section 3, Chemical Composition.

American Society for Testing Materials, A 235-42; 1942. American Assn. of State Highway Officials, M102. Carbon-Steel Forgings for General Industrial Use. Covers untreated, annealed, normalized, normalized and tempered, double normalized and tempered, and quenched and tempered forgings; in nine classes, for soft-steel, structural, ship fittings, bridges, machinery, shafts, axles, etc. Requirements for test specimen, boring and turning, heat treatments, chemical compositions, tensile properties, workmanship, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 235; 1943; affected section 7, Chemical Composition; Table I, Tensile Requirements.

American Society for Testing Materials, A 236-42; 1942. Carbon-Steel Forgings for Locomotives and Cars. Covers untreated, annealed, normalized, normalized and tempered, special normalized and tempered, and quenched and tempered forgings in nine classes. Gives requirements for heat treatment, chemical composition, boring and turning, tensile properties, test specimen, microscopic test, workmanship, and inspection. A.S.T.M. Emergency Alternate Provision, EA-A 236a; 1943; affected section 1, Scope; table I, Chemical Requirements; section 7, Chemical Composition; section 9, Check; table II, Tensile Strength; and section 10, Tensile Properties.

American Society for Testing Materials, ES-25; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Turbine Generator Rotors and Shafts. Cover annealed, normalized and tempered, and double normalized and tempered carbon-steel and alloy-steel forgings for turbine generator rotors and shafts. Process, discard, manufacture, machining, heat treatment, chemical composition, analysis, tensile properties, test specimens, number of test, retests, magnetic test, workmanship, finish, marking, internal inspection, inspection, and rehearing.

American Society for Testing Materials, ES-26; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Turbine Rotors and Shafts. Cover annealed, normalized and tempered, and double normalized and tempered carbon-steel and alloy-steel forgings for turbine rotors and shafts. Process, discard, manufacture, heat treatment, chemical composition, analysis, tensile properties, test specimens, number of tests, retests, stability test, magnetic test, workmanship, finish, marking, internal inspection, inspection, and rehearing.

American Transit Assn. Standard Design of Axles for Electric Railway Motors, E3-38; 1938. Motor axles in accordance with this standard are intended for operation under electrically propelled motor cars at a speed not in excess of 70 m.p.h., unless a lower maximum speed is specified. Includes designs of axles for railway motors and a table relative to rate capacity of standard motor axles.

American Transit Assn. Standard Specification for Quenched and Tempered Carbon Steel Axles, Shafts, and Similar Forgings, E5-37; 1937. Covers the manufacture, chemical and physical properties, tests, workmanship and finish, marking, inspection, and rejection of steel used for axles, shafts, and similar forgings. This specification is identical in substance with A.S.T.M. Specification A19-36.

American Transit Assn. Standard Specification for Annealed Carbon Steel Axles, Shafts, and Similar Forgings, E6-37; 1937. Covers the manufacture, chemical and physical properties, tests, workmanship and finish, marking, inspection, and rejection of steel used for axles, shafts, and similar forgings.

American Transit Assn. Recommended Rules for Inspection of Car Axles, E142-37; 1937. Recommendations given as to the methods of testing car axles for cracks when they are removed from trucks for renewal of wheels.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Axles. Designations based on load carrying capacity, by letter A, B, C, D, E, and F. Dimensional drawing of axle with journal sizes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Designs for Electric Traction Motor Axles Suitable for Gas-Electric and Similar Types of Heavy Traction Rail Motor Cars. In cooperation with the American Transit Engineering Assn. this organization has adopted the designs of the A.T.E.A. covering axles from 3 3/4 by 7 to 6 1/2 by 12 in., for rail cars, to be used in branch or main line local service. Materials for drive axles to be A.A.R. M-104, and for trailer axles to be A.A.R. M-101 grade B or M-102 grade 3. Not for high speed motorized trains for main line service.

Assn. of American Railroads, Operations and Maintenancee Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Driving Axles for Locomotives. Dimensional drawing of axle with allowable bearing pressures for passenger, freight, and switch engines. Details of design and formulae.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Eccentric Cranks and Crank Arms. Recommended and optional layouts for construction of eccentric and crank arms, of forged medium steel, or electric cast steel.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-101-42, changed A.A.R. Specification M-101-41, Axles, Carbon Steel, for Cars and Locomotive Tenders; section II, Chemical Properties and Tests; paragraph 12, Chemical Composition; and section III, Physical Properties and Tests; paragraph 21 Microscopic Tests.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Specification M-101-41; 1941. Axles; Carbon Steel, for Cars and Locomotive Tenders. Covers three grades of axles; includes forged, annealed, and normalized. Gives manufacture, chemical and physical properties and tests, workmanship and finish, permissible variations and weights, marking and storing, inspection, rejection, and reheating.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-104-42, changed A.A.R. Specification M-104-37, Normalized and Tempered Steel Forgings; section II, Chemical Properties and Tests; paragraph 7, Chemical Composition; and paragraph 9, Check Analysis; section III, Physical Properties and Tests; paragraph 12, Microscopic Tests; paragraph 14, Number of Tests; and paragraph 13, Macroscopic Test.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Engine Truck Axles. Covers several standard sizes of axles with dimensional drawings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. New Passenger Car Axles. Dimensional diagrams for five classes of axle and load limits for 100 and 85 m.p.h.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Normalized and Tempered Steel Forgings, M-104-37; 1937. Covers steel shafts, driving engine truck and trailer axles, crank pins, main and side rods, piston rods, valve stems, rod straps, eccentric cranks, and other hard steel forgings for locomotives and cars. Manufacture, chemical and physical properties, and tests for three grades of steel.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Pressures for Mounting Driving, Trailing, and Engine Truck Axles and Crank Pins. Recommended Practice, adopted 1931. Requirements for desired pressure, lubricant mixture, and pressures for 4 to 15 in. diameter axles and pins for cast iron, cast steel, or wrought steel.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Symbols for Marking Defective Axles. Specifies symbol number to be marked on defective part for classified defect.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Trailer Truck Axles; Sizes and Dimensions of, for Trailer Trucks of the Two Wheel Type. For locomotive trailer axles, drawing of standard axles, with optional variations and gives bearing pressures.

Assn. of American Railroads, Mechanical Div. Wheel and Axle Manual, 1942. Includes specifications and designs for wrought steel wheels, multiple-wear, engine truck, two-wear and one-wear, defects, cast steel wheels, spun steel wheels, cast iron wheels, car and tender axles, boring mill practice, axle lathe practice, wheel press, lathe, and grinding practice; gages, reforging, handling, storage, and shipping.

Formed Steel Tube Institute. Handbook of Welded Steel Tubing, 1941. Includes specifications for welded tubing for propeller shafts, diameters, gage, tolerance, classes of steels, table of torque values for automobile propeller shafts, table of critical speeds of welded tubular propeller shafts, limits of taper by taper swage, special shapes, etc.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Shafting; Cold Finished. Covers definition, manufacture, properties, sizes, uses, marketing methods, and packing.

References.—Alloy steel axles and shafts, *see* 622.6; methods of testing, general requirements for metals, *see* 600.1, 611.50; classification of railway materials, *see* 600.2; heat treatments, *see* 600.5; testing machine, *see* 611.50; shafting for ships, *see* 725.42; steel for shafts and axles, *see* 603.24, 621.31; steel forgings, *see* 611.51.

611.53 Wheels and Tires, Steel

American Iron and Steel Institute. Steel Products Manual, Section 20; 1938. Revised, 1943. Wrought Steel Wheels. Covers manufacture, wheel designs, classification according to service, rim thickness, chemical composition, heat treatment, machining, mating, permissible variations, and marking.

American Society for Testing Materials, A 25-41; 1941. Wrought Steel Wheels for Electric Railway Service. Gives requirements for chemical composition, ladle analysis, mating, permissible variations in dimensions, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 25a; 1942; affected section 4, Chemical Composition; section 8, Variations in Dimensions; section 9, Finish; and section 10, Markings; add appendices I and II.

American Society for Testing Materials, A 26-39; 1939. Steel Tires. Covers three classes for driving tires of passenger locomotives, driving tires of freight locomotives and tires for car wheels and miscellaneous service, and driving tires for switching locomotives. Gives chemical composition, tensile properties, test specimen, mating, and permissible variations in dimensions. A.S.T.M. Emergency Alternate Provision EA-A 26; 1942, affected section 4, Chemical Composition.

American Society for Testing Materials, A 57-44; 1944. Multiple-Wear Wrought Steel Wheels. For use under locomotives, tenders, and cars. Gives requirements for temperature regulation, chemical composition, ladle analysis, check analysis, mating, permissible variations in dimensions, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 57; 1942, affected section 5, Chemical Composition.

American Society for Testing Materials, A 186-39; 1939. One-Wear and Two-Wear Wrought Steel Wheels. For use under cars in freight and industrial service. Requirements for temperature regulation, chemical composition, ladle analysis, permissible variations in dimensions, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 186; 1942, affected section 5, Chemical Composition.

American Society for Testing Materials, A 244-44; 1944. Heat-Treated Wrought Steel Wheels. Covers three classes of heat-treated wrought steel wheels commonly used for locomotives, locomotive tenders, and passenger cars. Gives process, discard, temperature regulation, heat treatment, chemical composition, ladle and check analyses, hardness test, number of tests, retests, mating, permissible variations in dimensions, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 244; 1942, affected section 6, Chemical Composition.

American Transit Assn. Standard Specification for Steel Wheels for Electric Railway Service, E7-39; 1939. Gives requirements for wrought steel wheels including manufacture, chemical properties and tests, mating, permissible variations in dimensions, finish, marking, and inspection. Also gives requirements for spun steel wheels. Emergency Revision E7 (Em); 1942, changed requirements to meet demands of the present national emergency.

American Transit Assn. Standard Limit of Wear Gauges for A.T.E.A. Standard Flange Contours, E8-37; 1937. Drawings showing dimensions of gauges for worn-out standard wheel contours. Emergency Revision E8(Em); 1942, changed requirements to meet demands of the present national emergency.

American Transit Assn. Standard Plane Ring Gauge for Solid Steel Wheels, E9-37; 1937. Drawing of gauge for use in checking warp in wheel by placing it on the back of the ring.

American Transit Assn. Standard Wheel Mounting Gauge for A.T.E.A. Contours, E10-37; 1937. This gauge is made with a pointer for the center line of the axle so that the first wheel will be pressed on from the center line of the axle, thereby insuring that the wheels will not only be located the proper distance from each other but will be located centrally on the axle. Emergency Revision E10(Em); 1942, changed requirements to meet demands of the present national emergency.

American Transit Assn. Standard Design for Thread and Flange of Wheel, E13-38; 1938. Dimensional drawings of tread and flange contours for steel and chilled iron wheels. Emergency Revision E13 (Em); 1942, changed requirements to meet demands of the present national emergency.

American Transit Assn. Standard Dimensions of A.T.E.A. Steel Wheel Designs, E14-39; 1939. Gives diagram showing points at which dimensions covered by specifications are measured; also eight cables giving dimensions of parts of wheels 21 to 36 in. in diameter covering flanges, thicknesses, heights, contours, etc. Emergency Revision E14(Em); 1942, changed requirements to meet demands of the present national emergency.

American Transit Assn. Recommended Design for Wheel Checking Gauges for A.T.E.A. Contours A, B, C and D, E112-37; 1937. Drawing of gauge for use only in checking wheels in service and not for mounting wheels. Emergency Revision E112 (Em); 1942, changed requirements to meet demands of the present national emergency.

American Transit Assn. Recommended Specification for Finishing and Mounting of Wheels, Gears, and Axles, E146-38; 1938. Contains recommendations for mounting of wheels, gears, and axles, and gives designs of boring mill cutters for wheel roughing and finishing cutter.

Assn. of American Railroads, Mechanical Div. Wheel and Axle Manual, 1942. Includes specification and designs for wrought steel wheels, multiple-wear, engine truck, two-wear and one-wear, defects, cast steel wheels, spun steel wheels, cast iron wheels, car and tender axles, boring mill practice, axle lathe, wheel press, lathe, and grinding practice; gages, reforging, handling, storage, and shipping.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Emergency Specification E-M-103-42, changed A.A.R. Specification M-103-37, One-Wear Wrought Steel Wheels; section I (b), Design; section IV, Permissible Variations in Dimensions—Dimensions With Tolerances, and section II, Chemical Properties and Tests; paragraph 5, Chemical Composition.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-103-37; 1937. One-Wear Wrought Steel Wheels. Method of manufacture, chemical composition and test, mating, permissible variations in dimensions, markings, finish, design, inspection, rejection, and rehearing, with dimensional diagram.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-106-42, changed A.A.R. Specification M-106-42, Tires, Steel, Locomotives and Cars; section II, Physical Properties and Tests; paragraph 3, Chemical Composition.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Tires; Steel, Locomotives and Cars, M-106-42; 1942. Three classes by carbon content of steel, composition, tension test, mating, and permissible variations.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-107-42, changed A.A.R. Specification M-107-42; section I(b), Design; section IV, Permissible Variations in Dimensions—Dimensions With Tolerances; and section II, Chemical Properties and Tests; paragraph 5, Chemical Composition.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-107-42; 1942. Wheels; Multiple-Wear Wrought Steel. Covers multiple-wear wrought steel wheels for locomotives, tenders, and cars. Gives manufacture, chemical properties and tests, mating, permissible variations in dimensions, finish, marking, inspection, rejection, and rehearing, with dimensional diagrams.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Emergency Specification E-M-123-42; 1942, changed A.A.R. Specification M-123-42, Heat Treated Multiple Wear Wrought Carbon Steel Wheels; section IV, Permissible Variations in Dimensions; and section II, Chemical Properties and Tests.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-123-42; 1942. Heat-Treated Multiple-Wear Wrought Carbon Steel Wheels. Covers three classes of wheels for locomotives, locomotive tenders, and passenger cars. Gives manufacture, chemical properties and tests, mating, permissible variations in dimensions, finish, marking, inspection, rejection, and rehearing, with dimensional diagrams.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Driving and Trailer Wheels for Locomotives. Gives requirements for design, limits of weight and counterbalance effects, type of tire, cast steel as per A.A.R. specification. Includes dimensional drawings of wheels.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Flange Limit Gage for Remounting all Cast Iron and Cast Steel Wheels. Dimensional drawing for the fabrication of gage, finish requirements, and with diagrams showing method of use. Emergency Specification, 1942, changes requirements.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Flange Limit Gage for Remounting One-Wear, Wrought Steel Wheels. Dimensional drawing of gage. Hardened and ground on all gaging surfaces. Chromium-plated finish. Emergency Specification, 1942, changes requirements.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Grinding of Wheels. Instruction for type of grinding machine to grind circumference concentric with journal.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Hub Depression Gage for All Wrought Steel Wheels. Dimensional drawing for three sizes of wheel gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Limit Wear Gages for Condemning A.A.R. Wheel Gages. Dimensional diagram.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Locomotive Tire Manual. Requirements for steel making, tire manufacture, types of steel for tires for locomotives and cars, minimum thickness, sections of tires, shrinkage allowance, tire defects illustrated, preparation and application of tires to wheel centers, I.C.C. limits for tire thickness, and dimensional diagrams.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Master Gages for A.A.R. Wheel Gages. Recommended Practice. Master gage for checking tread worn hollow condemning limit gage for cast iron and cast steel wheels. Dimensional drawing.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Master Gages for A.A.R. Wheel Gages. Recommended Practice. Gives detailed dimensional drawings for fabrication and marking of master gages. For remounting cast iron and cast steel wheels. Dimensional drawing showing manufacture and giving finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Maximum Flange Thickness, Height, and Throat Gage, New, Multiple-Wear, Roll-Finished, Wrought Steel Wheels and Tires. Dimensional drawing for construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Maximum Flange Thickness, Height, and Throat Radius Gage for New, One-Wear Wrought, and One-Wear, Cast Steel Wheels, and Maximum Flange Thickness, and Throat Radius Gage, for New, Cast Iron Wheels. To be used only by inspectors at the foundry, dimensional drawing of gage, with requirement that gaging surfaces be hardened and ground and chromium-plate finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Maximum Flange Thickness, Height, and Throat Radius Gage, New, Multiple-Wear, Machine-Finished, Wrought Steel Wheels and Tires. Dimensional drawing for construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Mounting Gage for Multiple-Wear, Wrought Steel Wheels, and Multiple-Wear, Cast Steel Wheels. Gives manufacturing tolerances, requirements as to finish of gage, and detailed drawings for gages.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Section of Tire. Dimensional drawing of section showing radii and taper, for steel tired engine, tender truck and trailer wheels, and flanged driving tires of locomotives.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Steel Tires of Locomotive Wheels; Shrinkage Allowances for. Covers sizes from 20 to 78 in. exact center diameter with shrinkage allowance and exact bore.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Steel Wheel Gage. Service gage for measurement of rim and tread wear, diagrams for illustrating method of use, and for manufacture of gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Symbols for Marking Defective Cast Iron and One-Wear Cast Steel Wheels. Specifies number to mark on defective part for various types of classified defects.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Symbols for Marking Defective Multiple-Wear Two-Wear and One-Wear Wrought Steel and Steel Tired Wheels. Specifies number to mark on defective part for various types of classified defects.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Tires; Master Gage for Boring. Dimensional drawing for gaging the inside diameter of tire; various sizes of gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Tires; Steel, Minimum Thickness for. Dimensional drawing showing condemning limits for five types of steel tires.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Tread and Flange for All Steel-Tired Wheels. Standard, revised 1944. Dimensional drawing showing radii and taper of tread and flange; also limit of wear groove.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Tread and Flange Contour for Multiple- and Two-Wear Wrought and Cast Steel Wheels on Cars and Tenders and for Steel Tired Engine, Tender Truck, and trailer Wheels, and Flanged Driving Tires and Locomotives. Dimensional drawing.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Two-Wear Wrought Steel Wheels, M-121-37; 1937. Covers requirements as to design, manufacture, chemical and physical properties and tests, mating, permissible variation in flange, rim, plate, hub, and bore.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheel Centers; Master Gage for Turning. Dimensional drawing for several sizes of gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheel Circumference Measure for Cast Iron, Cast Steel, Wrought Steel, and Steel Tired Wheels. Covers instructions for the use of measure to insure that wheels mounted on the same axle are of the same diameter. Dimensional drawings and tolerance.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheels; Mounting. Table of mounting pressure in tons for steel and cast iron wheels, with specifications covering requirements for wear, gaging, alignment, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheel Mounting and Check Gage for Cast Iron, One-Wear Wrought, and Cast Steel Wheels. Dimensional drawing of gage.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and

Recommended Practice, 1942. Wheels; Steel, Rotundity Gage for. Dimensional Drawing for 33, 36, or 38-in. steel wheels.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheels; Steel Tired, Tire Fastening for. Dimensional drawing of tire showing method of mounting.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheel Tread and Flange for Cast Iron, One-Wear Wrought, and One-Wear Cast Steel Wheel. Dimensional drawing.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheel Tread Worn Hollow Limit Gage for Remounting Cast Iron and Cast Steel Wheels. Dimensional drawing of gage. Hardened and ground on all gaging surfaces. Chromium-plated finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wheels; Wrought Steel, Plane Gage for. Dimensional drawing for three sizes of gage.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-4; 1926. Tires; Steel.

References.—Methods of testing, general requirements for metals, *see* 600.1, 611.50; classification of railway materials, *see* 600.2; heat treatments, *see* 600.5; testing machine for forgings, *see* 611.50; cast iron wheels, *see* 611.18; cast steel wheels, *see* 611.49; steel forgings, *see* 611.51.

611.54 Springs, Helical and Elliptical, and Parts

American Society for Testing Materials, A 61-39; 1939. Steel Helical Springs. Gives requirements for general purpose springs; including material, physical tests, permissible variations for diameter, solid height, free height, loaded height, and permanent set, table of test loads for given fiber stress, finish, and inspection.

American Society for Testing Materials, A 62-39; 1939. Steel Elliptical Springs. Covers elliptical springs for general purposes; requirements as to materials, check analysis, physical tests for free height, loaded height, loaded length, and permanent set, permissible variations, finish, and inspection.

American Society for Testing Materials, A 125-39; 1939. Heat-Treated Steel Helical Springs. Includes carbon and alloy-steel hot-coiled compression springs made from round bars 1/2 in. and larger in diameter and suitable for use on railway equipment. Requirements for material, check analysis, coiling, heat treatment, physical tests, permissible variations, testing and table of test loads for given fiber stress, finish, and inspection.

American Society for Testing Materials, A 147-39; 1939. Heat-Treated Steel Elliptical Springs. Covers carbon and alloy-steel springs for railway use, also for miscellaneous elliptical and special flat springs. Requirements for material, check analysis, forming, heat treatment, design, physical tests, permissible variations, test loads, finish, and inspection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Design and Repairs to Locomotive Springs. Recommends that convex die blocks be used in clamping bands in hydraulic press with sketch of arrangement. Also diagrams and table covering ribbing of spring leaves.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Springs; Carbon Steel, Elliptical, M-113-42; 1942. Material, composition, manufacture, physical properties and tests, table of loads to correspond to maximum allowable fiber stress.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Springs; Carbon-Steel, Helical, M-114-42; 1942. Cover hot-coiled, compression springs, 1/2-in. and larger in diameter and suitable for railway equipment. Details as to manufacture, composition, physical properties and tests, load and deflection table, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Springs and Spring Caps for Freight Car Trucks. For nine sizes of spring and spring clusters, standard dimensional drawings of caps and springs, free and solid heights, weights and load capacity.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Spring Hanger Clips for Locomotive Elliptic Springs. For regular and inverted camber locomotive springs, dimensional drawings, and tables for drop forged steel hanger clips.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Pins and Bushings for Brake and Spring Rigging for Locomotives and Tenders. Gives pin, inside and outside bushings diameters, for material which can be case-hardened, for 3/4 to 4 1/2-in. bushings.

U. S. Gov., Marine Corps Specification, 1935. Spring; Helical, for Bedstead.

U. S. Gov., Marine Corps Specification, 1935. Spring; Helical, for Steel Cot.

U. S. Gov., Navy Dept. Specification 1S2a; 1916. Springs; Counter-Recoil, Gun Mount, Steel (for Use of Naval Gun Factory).

U. S. Gov., Navy Dept. Specification 42S10; 1928. Springs; Door, Coil, Torsion Type.

U. S. Gov., Navy Dept. Specification 49S9; 1940. Springs; Helical (Aircraft Use).

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-40092A; 1942. Spring; Helical, Heat-Treated.

References.—Alloy steel springs, *see* 622.7; methods of testing, general requirements for metals, *see* 600.1, 611.50; classification of railway materials, *see* 600.2; heat treatments, *see* 600.5; steel for springs, *see* 603.33, 621.34; bed springs, *see* 613.1.

611.55 Pinions and Gears

American Gear Manufacturers Assn. American Standards Assn., B6.3-1940. Recommended Practice for Backlash for General Purpose Spur Gearing Measured on Standard Center Distance With Feeler as Indicated in Diagram.

American Gear Manufacturers Assn. Standard 206.01; 1944. Fine Pitch Straight Bevel Gears; Tentative. Covers introduction, scope and limitations, general specifications, nomenclature and symbols, 90-degree axis bevel gears, and angular bevel gears.

American Gear Manufacturers Assn. Standard 207.01; 1944. Twenty-Degree Involute Fine Pitch System for Spur Gears; Tentative. Covers introduction, pressure angle, basic back and standard tooth proportions, pinion enlargements, center distances, standard center distance system, enlarged center distance system, tabulated dimensions, data sheets, fine pitch system for involute spur gears 20-degree basic pressure angle, and tables showing details for standard tooth proportions and 20-degree pressure angle involute fine pitch system for spur gears.

American Gear Manufacturers Assn. Standard 321.01; 1944. Helical and Herringbone Mill Gears; Tentative. Covers scope, rating of gears, service factors, design of gears and shafts, lubrication, marking, and figure showing variation of Wh with differential in hardness between pinion and gear.

American Gear Manufacturers Assn. Standard 420.01; 1944. Helical and Herringbone Gear Speed Reducers. Covers scope and responsibility, rating of gears, design of gearing, service factors, design of speed reducer, lubrication, marking, table giving service factors, and figures showing variation of thermal-horsepower capacity with center distance and face width for single reduction units and double reduction units.

American Gear Manufacturers Assn. Standard 421.01; 1944. High Speed Helical and Herringbone Gear Units; Tentative. Covers scope and responsibility, design and gearing, design of gear unit, lubrication, and marking.

American Gear Manufacturers Assn. Standard 460.01; 1944. Concentric and Parallel Shaft Gearmotors. Covers gearmotors only and is applicable to helical, herringbone, spur, and planetary gearmotors of single, compound, double, and triple reduction types. Gives rating of gears, design of gearing, application practice, design of gearmotor, lubrication, standard speeds, marking, table giving applicable classification, and figures showing variation of allowable intensity of shock with frequency and duration of peak loads.

American Society of Mechanical Engineers. American Standards Assn., B 6.1-1932. Spur Gear Tooth Form. This standard is a combination of the data developed in 1927 on the 14 1/2-degree composite system and the 20-degree stub involute system, and the 1932 data on 14 1/2- and 20-degree, full depth involute systems.

American Society of Mechanical Engineers, joint sponsor with American Gear Manufacturers' Assn. American Standards Assn., B 6.2-1933. Gear Materials and Blanks. These specifications are for forged and rolled carbon steel, steel castings, bronze and brass castings, and forged and rolled alloy steel. Recommendations cover—manufacture, ladle, and check analyses, finish, marking, inspection, etc. Also included are tables on chemical composition for each type of material.

American Society for Testing Materials, ES-23a; 1943. Emergency Specifications for Carbon-Steel Forgings for Rings for Main Reduction Gears. Covers three classes for normalized and tempered, and quenched and tempered, carbon-steel forgings for rings for main reduction gears, and for auxiliary drives. Process, discard, manufacture, heat treatment, chemical composition, analysis, hardness, number of tests, retests, workmanship, finish, marking, inspection, and rejection.

American Society for Testing Materials, ES-24; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Pinions for Main Reduction Gears. Cover normalized and tempered, or quenched and tempered, carbon-steel and alloy-steel forgings for pinions for main reduction gears and for auxiliary drives. Process, discard, manufacture, machining, heat treatment, chemical composition, analysis, tensile properties, hardness, test specimens, tests, retests, workmanship, finish, marking, inspection, and rehearing.

American Transit Assn. Standard Specification for Case Hardened Forged Steel and Quenched and Tempered Forged Steel Gears and Pinions, E19-38; 1938. This specification covers the manufacture of steel, inspection of gears and pinions, permissible variations in dimensions of gears and pinions, and three types of standard tooth forms on gears and pinions which are in accordance with the standards of the American Gear Manufacturers Assn.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-901-41; 1941. Approved Draft Gears for Freight Service. Covers draft gears for freight cars and freight locomotives having the A.A.R. standard pocket. Gives requirements for manufacture, inspection and tests, diagram of set-up for drop testing, with appendix on certificate of approval from A.A.R. laboratory.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-902-41; 1941. Purchase Specification for Approved Draft Gears for Freight Service. Covers inspection and test which purchaser may make. Gives manufacture, dimensions to fit standard pocket, coil springs, marking, drop test machine; preliminary, capacity, and sturdiness tests.

References.—Methods of testing, general requirements for metals, *see* 600.1, 611.50; heat treatments, *see* 600.5; steel for gears, *see* 603.22, 621.31; pinions and side gears for automobile differentials, *see* 722.34; steel forgings, *see* 611.51; lubrication for gears, *see* 504.0.

611.56 Turbine Bucket Wheels

American Society for Testing Materials, ES-27; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Turbine Bucket Wheels. Cover annealed or annealed, quenched, and tempered carbon-steel and alloy-steel forgings for turbine bucket wheels. Process, discard, manufacture, machining, heat treatment, chemical composition, analysis, tensile properties, hardness, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rehearing.

611.59 Miscellaneous Manufactures of Steel Forgings

American Society for Testing Materials, A 235-42; 1942. American Assn. of State Highway Officials, M102. Carbon-Steel Forgings for General Industrial Use.

Covers untreated, annealed, normalized, normalized and tempered, double normalized and tempered, and quenched and tempered forgings; in nine classes, for soft-steel, structural, ship fittings, bridges, machinery, shafts, axles, etc. Requirements for test specimen, boring and turning, heat treatments, chemical composition, tensile properties, workmanship, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 235; 1943; affected section 7, Chemical Composition; table I, Tensile Requirements.

American Society for Testing Materials, A 243-43; 1943. Carbon-Steel and Alloy-Steel Ring and Disk Forgings. Cover untreated, annealed, normalized, normalized and tempered, quenched and tempered, double normalized and tempered, and normalized; quenched and tempered carbon steel and alloy steel ring and disk forgings for general industrial use. Covers manufacture, machining, heat treatment, chemical composition, analysis, tensile and bending properties, test specimens, testing, workmanship, marking, inspection, and rejection.

American Society for Testing Materials, ES-21; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Magnetic Retaining Rings for Turbine Generators. Cover annealed, quenched, and tempered carbon-steel and alloy-steel forgings for magnetic retaining rings for turbine generators. Process, discard, manufacture, machining, heat treatment, chemical composition, analysis, tensile properties, test specimens, tests, retests, workmanship, finish, marking, inspection, and rehearing.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Draft Key Retainer. Dimensional drawing; shows application.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Draft Gear Followers. Covers requirements for material, size and tolerance, and finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Inspection and Maintenance of Draft Gears and Attachments by Car Owners. Recommends repair tracks where defective, or if total slack exceeds 1 1/2 in., at time of general repair, certified gears to be used if possible, serviceable used other gears not inefficient or obsolete as per A.A.R. interchange rules.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-901-41; 1941. Approved Draft Gears for Freight Service. Covers draft gears for freight cars and freight locomotives having the A.A.R. standard pocket. Gives requirements for manufacture, inspection and tests, diagram of set-up for drop testing, with appendix on certificate of approval from A.A.R. laboratory.

U. S. Gov., Federal Specification RR-G-661a; 1936. Gratings; Steel, Floor (Except for Naval Vessels). Covers two types—(I) parallel bearing bars, with cross members at right angles; and (II) parallel bearing bars, with diagonal cross members. Gives requirements for material, workmanship, construction, deflection, bearing bars, cross members, fasteners, and finishes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, 1940. Anchor; Kedge, for Pier, Temporary 10-Ton, Model 1940.

U. S. Gov., Navy Dept. Specification 6G1b; 1944. Grapnels.

U. S. Gov., Navy Dept. Specification 12G7; 1938. Gratings; Floor (Shipboard Use).

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for three grades of forged or rolled steel for pipe flanges, forged fittings, and valves and parts for service temperatures up to 1,000° F.—process, manufacturing practice, heat treatment, chemical composition, tensile properties, tests, retests, macro-tests, workmanship, finish, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-104-2D; 1941. Forging, for Common Steel Shell and Shrapnel.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-105-1; 1940. Forging; Steel, for Ordnance.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-105B; 1940. Forging; Small-Arms, Automotive, Drop and Miscellaneous, Steel Carbon, and Alloy.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-106A; 1945. Steel Forgings for Cannon Tubes.

References.—Alloy steel forgings, *see* 622.6; methods of testing, general requirements for metals, *see* 600.1, 611.50; heat treatments, *see* 600.5; steel for axles and shafts, *see* 603.24; spring and tool steel, *see* 603.3; alloy steel for forgings, *see* 621.31, 621.34, 621.35; hand tools, forged, *see* 615, 616; builders' hardware, forged, *see* 617; forged pipe flanges, *see* 607.4; ship couplings, forged, *see* 725.42; tools for metal working machines, *see* 765; automobile parts, *see* 722.3; journal boxes and lids of pressed steel, *see* 611.22; truck bolsters and coupler yokes of forged steel, see 611.49; locomotive crosshead pins, side rod pins and knuckle joints, of forged steel, *see* 702.9; bolts, nuts, screws, of forged steel, *see* 608.31, 608.32, 608.2; forged clevis for insulator attachment, *see* 719.62; insulator pin, drop forged, *see* 719.61; scissors and shears, forged, *see* 612.13; forged chain attachments, *see* 603.57.

612. CUTLERY, HOLLOW WARE, AND OTHER HOUSEHOLD UTENSILS

612.0 GENERAL ITEMS

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS62-38; 1938. Colors for Kitchen Accessories. Covers 6 colors adopted as standard for kitchen accessories, provides a standard sample plan for control of these colors at the source, specifies a method for visual comparison, and supplies a means for identification of standard colors from producer to user. Sponsored by National Retail Dry Goods Assn.

612.1 CUTLERY, EXCEPT TOOLS

612.11 Pocket Knives

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R99-30; 1930. Pocketknives. This recommendation establishes standard sizes and shapes of handles for pocketknives and the maximum number of varieties any one manufacturer may produce, standard colors of celluloid given for celluloid-handled knives.

U. S. Gov., Marine Corps Specification, 1933. Knife; Pocket, Electricians'.

U. S. Gov., Marine Corps Specification, 1944. Knife; Pocket, Utility.

U. S. Gov., Navy Dept. Specification 41J4b; 1942. Jackknives.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 17-170; 1937. Knife; Pocket, Engineer, Four-Blade, With Clevis.

612.12 Razors and Razor Blades

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R69-28; 1928. Packaging of Razor Blades. This recommendation establishes a schedule for packing various makes of razor blades, covering the number of blades per package, and the number of packages per carton. Sponsored by the National Wholesale Druggists Assn.

U. S. Gov., Navy Dept. Specification 29R1; 1944. Razors; Straight, Safety Type.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 22-194; 1940. Razor, Safety; and Blade, Safety Razor.

612.13 Scissors and Shears

U. S. Gov., Federal Specification GGG-S-101b; 1941. Amendment 1; 1944. Scissors and Shears. Covers three classes of shears—bankers', stationers', or paper; straight trimmers, household, or dressmaking; and bent trimmers; and three classes of scissors—embroidery, double pointed; ladies', one point sharp and one point blunt, and pocket, both points blunt. Gives requirements for size, material, and construction; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-GGG-S-101b; 1942, changed requirements for materials, finishes, and weights.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2534; 1939. Shear; Crown, Universal.

U. S. Gov., Veterans Administration. Specification VA-G-299; 1938. Scissors.

References.—Methods of testing, general requirements for metals, *see* 600.1; metal cutting shears, *see* 615.33; forged steel, *see* 611.51.

612.14 Table and Kitchen Cutlery

American Hospital Assn., 40-4. Mechanical Can Opener. Covers two sizes in table type openers.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-1-S. Outfit; 1-Man, Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-2-S. Outfit; 2-Man, Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-3-S. Outfit; 3-Man, Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-4-S. Outfit; 6-Man, Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-5-S. Outfit; 10-Man, Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-6-S. Outfit; 25-Man, Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-7-S. Outfit; 50-Man, Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-8-S, Outfit; 50-Man, Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-35-S. Knife; Butcher, 8- and 10-Inch Blade.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-36-S. Knife; Butcher, Folding Blade.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-37-S. Knife; Paring.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-38-S. Knife; Table.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-39-S. Fork; Meat, 10- and 12-Inch.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-40-S. Fork; Table.

U. S. Gov., Federal Specification RR-T-41a; 1938. Amendment 2; 1944. Tableware; Corrosion-Resisting Steel. Covers three types; (I) table knives—straight-blade, steak, and grille; (II) forks—dessert, flat-handle; and (III) spoons—tea and table (two types). Gives requirements for material, workmanship, size, shape, design, dimensions, tolerances, weights, and chemical composition; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-T-56; 1941. Amendment 1; 1944. Tableware; Steel (Chromium, Nickel, Silver, and Tin) Plated. Covers three types—(I) knives, table (straight-blade and grille); (II) forks (dessert, flat-handle); and (III) spoons (tea and table, medium). Gives requirements for material, workmanship, construction, finish; and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-C-746a; 1944. Cutlery; Galley and Kitchen. Covers 13 types—(I) butchers' cleavers, (II) cooks' forks, (III) boning knives, (IV) bread knives, (V) butchers' knives, (VI) cooks' knives, (VII) fish scaling knives, (VIII) paring knives, (IX) skinning (scimitar) knives, (X) slicing knives, (XI) steak, (scimitar) knives, (XII) spatulas, and (XIII) butchers' steels. Gives requirements for sizes, material, workmanship, finish, handles, marking, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1944. Knife, Fork, and Spoon; Haversack, Models of 1926.

U. S. Gov., Navy Dept. Specification 640 7b; 1943. Openers; Can.

U. S. Gov., Navy Dept. Specification 64S5b; 1943. Skimmers.

U. S. Gov., Navy Dept. Specification 64S7b; 1943. Spoons; Basting.

U. S. Gov., Navy Dept. Specification 64S10b; 1943. Strainers; Pot.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-70; 1939. Knife; Butcher.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-97; 1939. Fork; Flesh.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-8; 1938. Outfit; Officers' Mess, M-1937, Utensils.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-15; 1934. Knife, Fork, and Spoon; M-1926.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-31; 1938. Knife; Paring, M-1937, Corrosion-Resisting Steel.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-123; 1942. Utensils; Cooking Fork, Spoon, Ladle, Turner, and Skimmer.

U. S. Gov., U. S. Maritime Commission. Specification 63-MC-6; 1941. Tableware; Flatware, Steel, Corrosion-Resisting and Electro-Plated (Crew). Covers three types, three classes, and three grades. Gives requirements for material, workmanship, identification, knives, forks, spoons, shape, sizes, weights, dimensions, sampling, inspection, methods of test, and drawings.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-13; 1941. Cutlery; Galley. Shall be of five grades and of types and sizes specified. Gives requirements for detail dimensions, materials, workmanship, cleavers, forks, knives, handles, composition of metal, styles, dimensions, weights, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-29; 1941. Turners; Cake, Long Handle, Retinned. There shall be but one type and grade. Gives requirements for materials, workmanship, blades, handles, assembly, tinning, finish, sizes, tolerances, inspection and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-30; 1941. Turners and Servers; Plain or Perforated. There shall be seven types and five grades as listed. Gives requirements for materials for all types, workmanship, all types of blades, handle rods, handles or grips, ferrules, perforations, tolerances, sizes and dimensions, inspection, and methods of test.

U. S. Gov., Veterans Administration. Specification VA-G-159; 1936. Turners; Cake, Corrosion-Resisting Steel.

612.15 Pins and Needles

Pin, Clip and Fastener Assn. Safety Pin Physical Standards. Covers sizes, all-over lengths, and gages of wire for safety pins classified as—low carbon steel, high carbon steel, and steel furrier.

Pin, Clip and Fastener Assn. Straight Pin Physical Standards. Covers numbers, sizes and counts for steel bank (superplated), dressmaker (superplated), dressmaker (with oversized head), silk (chiffon and satin, superplated), and admontine.

U. S. Gov., Federal Specification FF-P-401b; 1943. Pins; Office. Covers—(I) brass, and (II) steel (tinned or plated); three classes—(A) bank or commerce, (B) pyramid, and (C) T-shaped (one or two piece). Gives requirements for material, workmanship, polishing and finishing, tolerances, size number, length, and diameter of wire; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification FF-P-416; 1940. Pins; Safety. Covers one type and grade, in small, medium, and large sizes. Gives requirements for material, workmanship, design, spring, hood, shield, point, finish, tolerances, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-FF-P-416; Jan. 1943, changed material, finish, diameter of wire, and packing.

U. S. Gov., Veterans Administration. Specification VA-X-58d; 1941. Needles.

612.16 Clippers

U. S. Gov., Marine Corps Specification, 1923. Clippers; Horse.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-178B; 1941. Clipper; Hair.

612.2 HOLLOW AND STAMPED WARE, IRON AND STEEL

612.20 General Items

American Bakers Assn. Recommended Pan Sizes. Covers four sizes of pans of loaves of bread weighing 12, 16, 20, and 24 oz. baked.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS30-31; 1931. Colors for Sanitary Ware. This standard designates colors to be used as a guide in production of sanitary ware, plumbing fixtures, and allied products made of vitreous china, procelain (all-clay) enameled iron, metals, wood, or glass. The standard gives also detail requirements for the six standard colors and method of making color comparisons.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS77-40; 1940. Sanitary Cast-Iron Enameled Ware. This standard provides minimum requirements for sanitary cast-iron enameled ware, such as bathtubs, lavatories, kitchen sinks, laundry trays, drinking fountains, and simialr fixtures. Requirements include material, thickness, warpage, enameling, acid-resistance, inspection rules, and marking. Sponsored by Sanitary Cast-Iron Enamel Ware Assn. Also printed in Spanish.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS-100-44; 1944. Porcelain-Enameled Steel Utensils. The purpose of this commercial standard is to establish standard specifications and methods of test for procelain-enameled steel utensils for the guidance of manufacturers, distributors, and users of this product. This standard provides performance requirements for porcelain-enameled steel utensils, both multiple-coated and single-coated, for cooking, household, food storage, and hospital use. The requirements include material of base, appearance, design, capacity and dimensions, base metal, pouring lips, handles, boiling acid resistance, thermal shock resistance, impact resistance, methods of test, and labeling.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R55-26; 1926. Tinware; Galvanized and Japanned Ware. This recommendation establishes a list of standard stock items for stamped ware, as bowls, covers, cups, dippers, molds, pans, plates, etc.; for metallic sieves; for pieced tinware boilers, buckets, kettles, pans, etc.; for heavy tinware coffee boilers, cake cutters, dippers, etc.; for japanned ware baths, cake boards, etc.; for galvanized baths, buckets, cans, hods, pails, etc.

References.—Enamel for enamel ware, *see* 531.6.

612.21 Bath Tubs

American Hospital Assn.; 58-1. Sanitary Cast Iron Enameled Ware. Covers minimum requirements.

American Hospital Assn.; 58-10. Enameled Pressed Iron or Steel Plumbing Fixtures.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R106-41;

1941. Hospital Plumbing Fixtures. This recommendation establishes a list of standard stock sizes and types of baby baths, receiving baths, prenatal baths, sitz baths, continuous-flow or prolonged-treatment baths, patients' baths, surgeons' scrub-up sinks, medicine sinks, instrument sinks, clinic sinks, service sinks, bedpan closets, and combination lavatory with integral instrument trays. Covers staple items, tolerances, grading rules, nomenclature, definitions, autoclave test for crazing, kiln support marks, special selection of large pieces, fixtures available in several materials, and back-flow connections. Sponsored by the American Hospital Assn., National Assn. of Master Plumbers, Sanitary Cast Iron Enameled Ware Assn., Vitreous China Plumbing Fixtures Assn., and the Sanitary Brass Institute.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures, (for) Land Use. Includes requirements for recessed, corner, and free-standing bathtubs made of enameled cast iron. Includes dimensions for various types; detail relative to trimmings and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, and illustrations, selections and air gaps.

References.—Porcelain and vitreous ware bathtubs, *see* 532.23, 617.76; gray cast iron, *see* 611.11; standard sizes of japanned ware and of galvanized baths, *see* 612.20; standard colors for colored sanitary ware, *see* 612.20.

612.22 Hotel and Household Hollow and Stamped Ware

American Hospital Assn., 64-7. Corrosion-Resisting Steel Tableware. Covers three types. Based on U. S. Gov. Federal Specification RR-T-41a for Corrosion-Resisting-Steel Tableware and QQ-M-151a for General Specification for Inspection of Metals.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 41. Platters; Meat, Metal.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 42. Pans; Muffin.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 45. Colanders; Steel.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 46. Pots; Food, Covered.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 48. Dippers; Steel.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 53. Turners; Pancake.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 54. Spoons; Cooking.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 56. Insets; Steel, for Steam Table.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 58. Ladles; Steel.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 59. Dishes; Vegetable, Steel.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 60. Pitchers; Steel.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 66. Pans; Muffin, Retinned.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 67. Plates; Pie, Tinned.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 68. Colanders; Retinned.

U. S. Gov., Federal Specification RR-B-644; 1943. Boxes; Spice. Covers one type and one grade and shall consist of an outer spice box with hinged cover and hasp, enclosing six spice containers of uniform size and shape. Gives requirements for material, workmanship, and details for outer spice box, outer spice box cover, handle, hasp, spice containers, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification RR-C-526; 1939. Amendment 1; 1940. Colanders; Bakers, Corrosion-Resisting Steel. Covers one type and grade, either 25 or 40 qt. minimum capacity (volume). Gives requirements for material, workmanship, construction, finish, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification RR-C-531; 1939. Amendment 1; 1940. Colanders; Corrosion-Resisting Steel. Covers one type and grade, either 3 1/2, 11, or 16 qt. minimum capacity (volume). Gives requirements for material, workmanship, construction, finish, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-C-611; 1939. Amendment 1; 1940. Covers; Cake, Corrosion-Resisting Steel. Covers one type and grade and three sizes. Gives requirements for material, workmanship, finish, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-55; 1941. Amendment 1; 1944. Pans; Bake and Roasting, Steel. Covers two types—(I) plain, with handles, steel ears, and without bottom straps, and (II) with steel handles, ears, and bottom straps. Gives requirements for material, workmanship, folds, construction, handles, bottom straps, handle ears, shape, and sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-58; 1943. Pans; Bread. Type I—individual pans; type II—multiple pans; classes—(A) two individual pans, (B) three individual pans, (C) four individual pans, and (D) five individual pans. Classes C and D include two or more sizes. Gives requirements for material, workmanship, body material, wire bead, finish, shape, pan construction, and details for each type and class; methods of sampling and inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-83; 1943. Pans; Fry, Cast-Iron (Skillets). Shall be in one type and grade. Covers three sizes—(A) 10-in., (B) 12-in., and (C) 14-in. Gives requirements for material, workmanship, casting, pouring lips, handle, lacquer coat, and detailed dimensions and weights; methods of sampling and inspection; and packaging, packing, and marking.

U. S. Gov., Federal Specification RR-P-86; 1939. Amendment 2; 1940. Pans; Fry, Corrosion-Resisting Steel-Clad (3-Ply). Covers one type, one grade, and seven sizes. Gives requirements for material, workmanship, construction, finish, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-RR-P-86; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specification RR-P-89 for Pans; Fry, Steel.

U. S. Gov., Federal Specification RR-P-89; 1940. Amendment 1; 1944. Pans; Fry, Steel. Covers the round type with handle, and three sizes—6-in., 8 7/8-in., and 12-in. Gives requirements for material, workmanship, construction, sizes, and tolerances; methods of sampling, inspection, and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-101; 1939. Pans; Pudding, Corrosion-Resisting Steel. Covers one type and one grade—first class. Gives requirements for material, workmanship, construction, finish, and capacities; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-111; 1939. Amendment 1; 1940. Pans; Sauce, Corrosion-Resisting Steel-Clad (3-Ply). Covers one type and grade of 1 1/2-, 2-, 3 1/2-, and 5-qt. capacities. Gives requirements for material, workmanship, construction, chemical requirements of outside layer, capacities, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-386; 1939. Amendment 1; 1940. Pitchers; Water, Corrosion-Resisting Steel. Covers one type and grade, 1 1/8-, 2 1/8-, and 3 1/4-qt. minimum capacity. Gives requirements for material, workmanship, construction, finish, and capacities; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-401; 1939. Plates; Pie, Tinned. Covers one type, one grade, and two sizes—10 in. and 9 in. outside diameter at top of plate. Gives requirements for tin plate gage, tolerance, weight of tin coating, tin coating, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-RR-P-401; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for materials and finish.

U. S. Gov., Federal Specification RR-P-416; 1939. Platters; Meat, Corrosion-Resisting Steel. Covers one grade and two types—(I) with flat beaded edge, and (II) with open flange edge. Gives requirements for material, workmanship, construction, tolerances, and finishes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-S-131; 1939. Amendment 1; 1939. Scoops; Kitchen, Corrosion-Resisting Steel. Covers one type and grade. Gives requirements for material, workmanship, finish, shapes, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-T-46; 1941. Tableware; Nickel-Alloy. Covers three types—(I) forks (flat-handle, dessert; flat-handle, regular; and salad); (II) knives (straight-blade); and (III) spoons (iced tea, soup, round-bowl, sugar, medium table, regular table, and tea). Covers material, workmanship, sizes, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-RR-T-46; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specification RR-T-56 in lieu of RR-T-46.

U. S. Gov., Federal Specification RR-T-806; 1942. Amendment 1; 1944. Turners; Cake. Covers two types—(I) vitreous enameled steel, and (II) plain steel. Gives requirements for material, workmanship, construction, and sizes and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification, JAN-T-46; 1944. Trays; Mess, 6-Compartment.

U. S. Gov., Marine Corps Specification, 1919. Pan; Roasting.

U. S. Gov., Marine Corps Specification, 1944. Tray; Mess, Serving, 6-Compartment.

U. S. Gov., Navy Dept. Specification 63L1a; 1944. Linings; Baking-Dish, Steel.

U. S. Gov., Navy Dept. Specification 63P2a; 1944. Platters; Steel.

U. S. Gov., Navy Dept. Specification 63P3; 1941. Plates; Dinner, Steel.

U. S. Gov., Navy Dept. Specification 63T7b; 1944. Tureens.

U. S. Gov., Navy Dept. Specification 64B4e; 1943. Boilers; Coffee.

U. S. Gov., Navy Dept. Specification 64B10b; 1944. Boilers; Fish.

U. S. Gov., Navy Dept. Specification 64B18; 1944. Boxes and Canisters; Galley.

U. S. Gov., Navy Dept. Specification 64C8a; 1944. Colanders.

U. S. Gov., Navy Dept. Specification 64L2a; 1944. Ladles; Galley.

U. S. Gov., Navy Dept. Specification 64P6d; 1944. Pans; Baking, Roasting, and Deep-Fat-Frying.

U. S. Gov., Navy Dept. Specification 64P8b; 1944. Pans; Dish.

U. S. Gov., Navy Dept. Specification 64P19; 1944. Pans and Pots; Sauce, With Covers.

U. S. Gov., Treasury Dept., Procurement Div., No. 474; 1941. Sieves; Flour. Two types—(I) household size (with crank) and (II) institution size (without crank). Gives general description and requirements for sheet metal, hopper or body, wire cloth, agitator or base, handles, finish, and strength; methods of inspection and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 523a; 1944. Enamelware; Bakeshop and Kitchen. Covers 25 types and a large number of classes intended to include all kinds of enamelware vessels for bakeshop and kitchen. Gives requirements for colors and finishes, material, workmanship, processing, finish, thickness of metal, thickness of enamel, tolerances, handling facilities, reflectance, impact resistance, resistance to sudden changes in temperature, acid resistance, solubility, adherence, marking, and details for each type and class; methods of sampling,

inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 534a; 1942. Buckets; Mopping Apparatus; Oval, Caster Mounted. This specification covers oval shaped buckets mounted on casters for use with hand operated mop wringers. Buckets furnished in four sizes—16, 26, 35 and 50 qt. Gives requirements for design, fabrication, seams, top rim, ears, bail, casters, dimensions, and thickness of metal; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-12A; 1939. Urn, Coffee.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-32; 1938. Pot; Tea and Coffee, Individual, Corrosion-Resisting Steel.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-35; 1939. Dishes; Enamelware.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-40; 1939. Cutter; Baking.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-41; 1939. Grater; Nutmeg.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-44; 1939. Turner; Cake.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-45; 1939. Pot; Tea.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-46; 1939. Grater; Large.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-52; 1939. Steeper; Tea.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-58A; 1940. Bowl; Mixing, Corrosion-Resisting Steel.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-65; 1939. Corer; Apple.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-69; 1939. Grater; Small.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-72A; 1941. Pan; Cake.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-74; 1939. Pot; French Fry.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-81A; 1941. Strainer; 3-Inch and 9-Inch.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-82; 1939. Strainer; Chinese.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-90; 1939. Kettle; Roasting.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-9C; 1937. Pan; Bake and Roasting.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-30; 1938. Colander; Retinned.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-108; 1940. Pan; Muffin, Retinned.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-112; 1941. Pan; Tin, Cake, for Range Field, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-123; 1942. Utensils; Cooking Fork, Spoon, Ladle, Turner, and Skimmer.

U. S. Gov., U. S. Maritime Commission. Specification 63-MC-3; 1941. Covers; Toast, (Nesting) Corrosion-Resisting Steel. There shall be but one type, one grade, and three sizes. Gives requirements for material, workmanship, construction, design and measurements, finish, marking, sampling, inspection, methods of test, and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-3; 1941. Amended, 1943. Fry Pans; Heavy Lipped and French Style, Cold-Rolled Steel. Type I—heavy lipped fry pans; type II—French style frypans; and there shall be but one grade. Gives requirements for materials, workmanship, coating, handles, sizes, tolerance, and body; packaging, packing, and marking; inspection and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-7; 1941. Pans; Roasting, Heavy Seamless Steel. Type I—plain; type II—with bottom straps; and the grade shall be that known as "firsts." Gives requirements for material, workmanship, folds, construction, handles, bottom straps and handle bars, inspection, methods of test, and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-16a; 1944. Pans; Bread and Cake. Covers five types—(I) biscuit or roll pan (sheet) four sides up; grade (A) tinned sheet and (B) blue annealed sheet; (II) biscuit or roll pan (sheet) three sides up; grade (A) tinned sheet and (B) blue annealed sheet; (III) individual bread pan, tinned; (IV) pullman bread pan with sliding cover, tinned; and (V) cake (layer) pan, tinned. Gives requirements for size, material, workmanship, marking, and details for each type and grade; sampling, inspection, and methods of tests; and packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-20a; 1942. Bowls; Mixing, Retinned. There shall be but one type and grade and sizes shall be as given. Gives requirements for materials, workmanship, construction, tinning, tolerances, inspection, methods of test, and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-21a; 1942. Bowls; Beating, Retinned. There shall be but one type and one grade and the sizes shall be as specified. Gives requirements for materials, workmanship, construction, hanging ring and ear, tinning, assembly, tolerances, inspection, methods of test, and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-22; 1941. Pans; Dish, Round, Retinned. There shall be but one type and grade and sizes shall be as specified. Gives requirements for materials, body, handles, tinning, tolerances, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-23; 1941. Fry Pans; Deep, Long Handle. There shall be but one type and grade and sizes shall be as specified. Gives requirements for materials, workmanship, body, handle, sizes, tolerances, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-24; 1941. Pots; Sauce, Deep, Retinned. Type I—pots without covers; type II—pots with covers; and there shall be but one grade. Gives requirements for material, workmanship, body, sizes and capacities, tolerances, thickness of sheet, handles, tinning, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-25; 1941. Pots; Stock, Retinned. Type I—pots without faucet with cover; type II—pot with faucet and with cover; and there shall be but one grade.

Gives requirements for material, workmanship, body, sizes and capacities, tolerances, thickness of sheet, handles, retinned covers, tinning, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-26; 1941. Pans and Pots; Service, Retinned. There shall be seven types as listed and but one grade. Gives requirements for materials, workmanship, thickness of sheet, dimensions, body, handles, retinned covers, tinning, capacities, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-27; 1941. Pans; Baking, Oblong, Enamelware. There shall be but one type and grade and sizes shall be as specified. Gives requirements for sheet, enamel, workmanship, pans, sides, corners, top edges, bottoms, enameling, reflectance, color, dimensions, tolerance, capacities, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-28; 1941. Plates; Pie, Tin Plate. There shall be but one type and grade. Gives requirements for material, workmanship, tin plate gage, weight of tin coating, tinning, sheets, sizes, tolerance, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-32; 1941. Pans; Pudding, Enamelware. There shall be but one type and grade and sizes shall be as specified. Gives requirements for sheet metal, enamel, workmanship, pans, sides, top edges, bottoms, enameling, reflectance, color, tolerance, capacities, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-34a; 1943. Canisters; Round and Square. Covers two types—(I) round (class A, without handles, and class B, with handles) and (II) square. Gives requirements for materials, workmanship, construction, finish, continuity of coating, and marking; details for each type and class including size numbers and dimensions; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-35; 1941. Colanders; Retinned. Type I—galley colanders; type II—baker colanders; type III—windsor colanders; and there shall be but one grade. Gives requirements for bodies, handles, feet, end supports, workmanship, tinning finish, perforations, tolerances, dimensions, thickness, capacities, sizes, inspection, methods of test, and drawings.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-40; 1941. Pans; Muffin, Corn or Lemon Cake. Type I—tin plate; type II—retinned; and there shall be but one grade. Gives requirements for materials, workmanship, frames, bead, wire, cups, assembly, cleaning, tin plate sheets, sizes, tolerance, retinning, inspection, methods of tests, and drawings.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-41; 1941. Percolators; Coffee, Enamelware, Seamless. There shall be but one type and grade and sizes shall be as specified. Gives requirements for colors, material, workmanship, body, bottom, side walls, spout, handle, hinge, cover, top, distribution plate, basket, base, enameling, capacities, thickness, tolerances, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-42; 1941. Pitchers; Water, Enamelware, Seamless. There shall be but one type and grade and sizes shall be as specified. Gives requirements for colors, materials, workmanship, body, handle, enameling, reflectance, capacities, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-44; 1941. Ladles; Galley, Retinned. Type I—French ladles; type II—deep ladles; type III—large ladles; class A—solid ladles; class B—strainer ladles; and there shall be but one grade. Gives requirements for materials, workmanship, bowls, handles, rivets, tinning, perforations, capacity, tolerance, inspection, methods of test, and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-45; 1941. Skimmers; Galley, Retinned. There shall be but one type and grade. Gives requirements for materials, workmanship, blades, handles, rivets, tinning, design, sizes, inspection, methods of test, and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-46; 1941. Spoons; Basting and Mixing, Retinned. Type I—service; type II—commercial; type III—stamped; class A—solid bowl; class B—perforated bowl; class C—slotted bowl; and there shall be but one grade. Gives requirements for material, workmanship, spoons, tinning, finish, figures, tolerance, inspection, methods of test, and drawings.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-48; 1941. Tray; Messing, Individual, 6 Compartments. There shall be but one type and grade. Gives requirements for compositions, workmanship, construction, metal, bead, finger grip holes, finish, tolerances, sampling, inspection, methods of test, and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-49; 1942. Plates; Mess, 6 Compartment, Enamelware. Covers one type, grade, and size. Gives requirements for stock, enamel, workmanship, fabrication, enameling and finishing, acid resistance, and impact resistance; sampling, inspection, and methods of test; and packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-G-137a; 1936. Bowls; Mixing, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-138b; 1936. Cooking Spoons; Slotted.

U. S. Gov., Veterans Administration. Specification VA-G-145; 1935. Colander; Baker, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-146; 1935. Pans; Pudding, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-149a; 1937. Pans; Roasting, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-151a; 1937. Pot; Stock, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-168; 1936. Pans; Bun, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-169; 1936. Pans; Baking and Roasting, Aluminum.

U. S. Gov., Veterans Adminstration, Specification VA-G-188c; 1937. Boiler; Coffee, Aluminum, Capacity 14 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-189; 1936. Pans; Muffin, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-191a; 1937. Pans; Roast, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-192; 1936. Pots; Baked Beans or Brown Bread, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-194; 1936. Boiler; Coffee, Aluminum, Capacity 18 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-199a; 1938. Pans; Baking and Roasting, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-204; 1936. Pans; Baking and Roasting, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-205; 1936. Pans; Baking and Roasting, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-210a; 1937. Pans; Bake, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-211c; 1937. Boiler; Coffee, Aluminum, Capacity 8 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-212; 1936. Pans; Pudding, Shallow, Aluminum, Capacity 10 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-213a; 1937. Pans; Pudding, Aluminum, Capacity 10 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-214a; 1937. Pots; Coffee, Aluminum, Capacity 4 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-215; 1936. Roaster; Covered, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-217c; 1938. Pots; Coffee, Aluminum, Capacity 3 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-219a, 1937. Pot; Sauce, Aluminum, Capacity 20 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-224; 1936. Pans; Baking and Roasting, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-230; 1936. Boiler; Coffee, Aluminum, Capacity 24 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-231; 1936. Pans; Sauce, 2 1/2 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-232; 1936. Pans; Pudding, 1 1/2 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-234b; 1937. Pans; Baking and Roasting, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-235; 1936. Pans; Sauce, Aluminum, Capacity 1 Quart.

U. S. Gov., Veterans Administration. Specification VA-G-236; 1936. Pan; Sauce, Aluminum, Capacity 44 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-237; 1936. Pans; Baking, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-239; 1936. Pans; Roast, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-259; 1937. Pan; Saute, Aluminum, 7 1/2 Quarts Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-260; 1937. Pan; Sauce, Aluminum, Capacity 34 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-261; 1937. Pan; Sauce, Aluminum, Capacity 20 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-262; 1937. Colander; Aluminum, Capacity 11 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-264a; 1937. Pan; Roasting, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-268; 1937. Pans; Saute, Aluminum, Capacity 11 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-269; 1937. Baking Sheet; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-274; 1937. Pan; Cheese Cake, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-278a; 1940. Pans, Sauce; and Covers.

U. S. Gov., Veterans Administration. Specification VA-G-285; 1937. Tubed Cake Pan.

U. S. Gov., Veterans Administration. Specification VA-G-291; 1937. Pots; Sauce, Aluminum, Capacity 26 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-318; 1938. Steak Pan.

U. S. Gov., Veterans Administration. Specification VA-G-319; 1938. Pans; Muffin, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-326; 1938. Pans; Sauce.

U. S. Gov., Veterans Administration. Specification VA-G-333; 1939. Aluminum Roast Pan.

U. S. Gov., Veterans Administration. Specification VA-G-334; 1939. Aluminum Sauce Pan.

References.—Standard stock sizes, *see* 612.20.

612.23 Water-Closets and Sinks

American Hospital Assn., 58-1. Sanitary Cast Iron Enameled Ware. Covers minimum requirements.

American Hospital Assn., 58-10. Enameled Pressed Iron or Steel Plumbing Fixtures.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures, (for) Land Use. Includes requirements for enameled cast iron, nickel-copper alloy or corrosion-resisting steel alloy kitchen sinks covering various types, including drainboards and legs; also requirements for supports, trimmings, and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures, (for) Land Use. Includes requirements for service sinks made of vitreous china and cast iron. Gives requirements for supports, trap standards, rim guards, and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Joint Army-Navy Specification JAN-P-170; 1944. Pans and Pots; Sauce, With Covers.

U. S. Gov., Veterans Administration. Specification VA-MC-129g; 1942. Sinks; Light and Heavy Duty, Galvanized Iron or Steel.

U. S. Gov., Veterans Administration. Specification VA-M-130; 1935. Galvanized Steel or Iron Sinks.

U. S. Gov., Veterans Administration. Specification VA-MC-285e; 1942. Sinks; Commercial Type, Galvanized Iron or Steel.

References.—Porcelain and vitreous ware water-closets and sinks, *see* 532.23; gray cast iron, *see* 611.11; zinc coatings and tests, *see* 600.3; galvanized steel sheets, *see* 604.32; standard colors for colored sanitary ware, *see* 612.20; seats and hinges for water closet bowls, *see* 532.23.

612.24 Hotel and Household Gas Kitchen Equipment

612.29 Miscellaneous Hollow and Stamped Ware

Assn. of American Railroads, Purchases and Stores Div. Marking Pot, 1934. Gives dimensional requirements and illustration of marking pot made of IX bright tin, or steel of suitable thickness.

Assn. of American Railroads, Purchases and Stores Div. One Quart and One Gallon Funnels, 1934. Gives dimensions, gage of metal, and design of conical shape funnels of tin or sheet metal.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-23-S. Pot; Coffee, 2 1/2 Quart, Aluminum.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-42-S. Spoon; Table.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-43-S. Spoon; Dessert.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-44-S. Spoon; Tea.

U. S. Gov., Dept. of Agriculture, Forest Service, Specifications 247-45-S. Ladle; Soup.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-50-S. Can Opener.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications 247-55-S. Basin; Wash, Retinned.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-14. Pan; Half-Oval.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-30-S. Plate; Tin.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-247-31-S. Cup; Miner's, Tin, Retinned.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R182-41; 1941. Food Service Equipment. This recommendation is concerned not only with the sizes and dimensions of complete units of equipment but also with the details of construction. Initiated by the food service equipment industry.

U. S. Gov., Federal Specification RR-C-844; 1937. Amendment 2; 1945. Cuspidors, Spittoons. Covers two types—(I) plain, in five classes—brass, with pan; brass, without pan; corrosion-resisting steel or nickel-copper alloy; steel, with top; steel, without top; and (II) self-righting, in five classes—aluminum, formed; aluminum, seamless; brass; iron; steel. Gives requirements for material, workmanship, rim, self-righting, base, marking, tolerance, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification RR-P-66; 1939. Amendment 2; 1940. Pans; Dish, Corrosion-Resisting Steel. Covers one type; one grade, and five capacities—12, 15, 20, 24, and 36 qt. Gives requirements for material, workmanship, construction, shapes, dimensions, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-70; 1942. Pans; Dish, Steel. Covers one type in 14, 20, and 30 qt. capacities. Gives requirements for material, workmanship, body, handles, finish, cleaning, marking, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-76; 1935. Pans; Dust. Covers two types—(I) hood pattern; in two classes—(A) welded handle, and (B) covered wire handle; and (II) open pattern; in three classes—(A) welded handle, (B) covered wire handle, and (C) one piece. Gives requirements for material, workmanship, construction, finish, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-571; 1939. Amendment 1; 1944. Pots; Marking, Ink. Covers one type, grade, and size. Gives requirements for material and workmanship, tinned plate, coating, body, cover, handle, illustration, dimensions, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-T-661; 1936. Threads; Safety, Metallic. Covers two types—(A) filled, and (B) cast; and seven classes. Gives requirements for material, workmanship, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-C-82; 1944. Carriers; Food.

U. S. Gov., Joint Army-Navy Specification JAN-C-88; 1944. Cups; Canteen, Corrosion-Resisting Steel.

U. S. Gov., Marine Corps Specification, 1942. Dipper, for No. 1 Field Range.

U. S. Gov., Marine Corps Specification, 1942. Funnels; Large and Small.

U. S. Gov., Marine Corps Specification, 1933. Scuttle; Coal.

U. S. Gov., Navy Dept. Specification 41F6b; 1944. Funnels.

U. S. Gov., Navy Dept. Specification 41T29; 1941. Thimbles; Sewing.

U. S. Gov., Navy Dept. Specification 63D2; 1941. Dishes; Vegetable, Steel.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2483; 1939. Pitchers; Enamelware.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-38; 1939. Pot; Stock, Corrosion-Resisting Steel.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-56; 1939. Dipper; 1-Pint, Enamelware.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-94; 1939. Scoop; Small, Grocers'.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-106; 1939. Dipper; Milk.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-107; 1940. Dipper; 1-Quart.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-16; 1934. Canteen and Cup M-1910.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-124; 1944. Cup; Canteen, Aluminum.

U. S. Gov., U. S. Maritime Commission. Specification 63-MC-8; 1942. Servers; Insulated, Evacuated. Type

I—coffee server; type II—ship server; six grades, sizes, and three classes. Gives requirements for materials, workmanship, inner shells, finish, marking, seams, handles, capacities, dimensions, metal thickness, design, covers, insulation, sampling, inspection, tests, and drawings.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-12; 1941. Dog Basket. There shall be one type and grade. Composition I—galvanized; class A, hot-dipped galvanized; class B, galvanized sheet; composition II—tinned; class A, hot-dipped tin, and class B, tin plate. Gives requirements for materials, workmanship, construction, sheet metal, body, foot, handles and bars, watertightness, tolerances, inspection. methods of test. and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-37; 1941. Kettles; Tea, Enamelware, Seamless. Type I—large-mouth spout (faucet-fill type); type II—gooseneck spout; and there shall be but one grade. Gives requirements for materials, workmanship, body, cover, spout, ears, bail, handle, enameling, reflectance, color, capacities and dimensions, tolerances, sampling, inspection, and tests.

U. S. Gov., Veterans Administration. Specification VA-G-50; 1932. Pans; Dust.

U. S. Gov., Veterans Administration. Specification Va-G-118c; 1936. Covers; Cake, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-128b; 1936. Dippers; Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-131b; 1939. Pot; Tea and Coffee, Individual Semi-Deluxe.

U. S. Gov., Veterans Administration. Specification VA-G-143a; 1937. Pitchers; Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-148; 1936. Pot; Coffee, 2-Quarts Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-150a; 1938. Food Container With Clamp Covers.

U. S. Gov., Veterans Administration. Specification VA-G-152a; 1940. Bowls; Baker, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VG-G-154; 1938. Kettles; Sponge, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-160a; 1940. Containers; Liquid, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-163a; 1940. Ladle; Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-167b; 1937. Pans; Baking and Roasting, Aluminum.

U. S. Gov., Veterans Administration. Specification Va-G-182a; 1937. Pans; Dish, Aluminum, Capacity 27 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-186; 1936. Pans; Saute, Aluminum, Capacity 6 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-187; 1936. Pans; Sauce, Aluminum, Capacity 60 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-197a; 1937. Tubs; Pie, Aluminum, Capacity 102 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-206a; 1937. Bowl: Mixing, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-208; 1936. Bowls; Mixing, Aluminum, 122 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-216b; 1937. Kettles; Sponge or Egg, Aluminum, Capacity 16 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-220b; 1937. Tubs; Pie, Aluminum, 65 Quarts Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-223; 1936. Containers; Inset, Food Truck, Aluminum, Capacity 3 1/2 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-226; 1936. Pots; Stock, Aluminum, Capacity 20 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-227; 1936. Pots; Stock, Aluminum, Capacity 12 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-233a; 1937. Pans; Dish, Capacity 40 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-238; 1936. Pan; Dish, Aluminum, 26 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-245a; 1937. Container; Liquid, With Bail Handle, Capacity 4 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-248; 1936. Candy Kettle; Aluminum, 9 Gallons Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-249; 1936. Candy Kettle; Aluminum, Capacity 25 Gallons.

U. S. Gov., Veterans Administration. Specification VA-G-250; 1936. Trays; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-251; 1936. Pots; Tea. Aluminum, Capacity 2 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-252; 1937. Container; Food Truck, Aluminum, Capacity 9 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-253; 1937. Steam Table Pot Covers.

U. S. Gov., Veterans Administration. Specification VA-G-254a; 1937. Covers; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-256; 1937. Pans; Dish, Aluminum, Capacity 21 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-257a; 1937. Food Containers; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-258; 1937. Pot; Stock, Aluminum, 11 Gallons Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-263; 1937. Plate; Pie.

U. S. Gov., Veterans Administration. Specification VA-G-265; 1937. Suds Dipper.

U. S. Gov., Veterans Administration. Specification VA-G-267a; 1937. Pot; Stock, Aluminum, 20 Quart Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-272; 1937. Pan; Dish, Aluminum, Capacity 16 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-276; 1937. Pot; Stock, Aluminum, Capacity 120 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-277; 1927. Bowl; Mixing, Aluminum, Capacity 48 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-279; 1937. Pans; Refrigerator, Aluminum, With Sliding Cover.

U. S. Gov., Veterans Administration. Specification VA-G-280; 1937. Pot; Sauce, Aluminum, Capacity 34 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-281; 1937. Pots; Tea, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-282; 1937. Bowl; Mixing, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-283; 1937. Pan; Baking and Roasting.

U. S. Gov., Veterans Administration. Specification VA-G-286; 1937. Pot; Stock, Aluminum, 20 Quart Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-290; 1937. Pans; Roast, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-291; 1937. Pots; Sauce, Aluminum, Capacity 26 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-292; 1937. Tray; Aluminum, Oval.

U. S. Gov., Veterans Administration. Specification VA-G-295a; 1938. Pots; Stock, Aluminum, Capacity 25 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-296; 1938. Soup Tureen; Aluminum, Capacity 8 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-297; 1938. Tureen; Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-298; 1938. Tub; Pie, Aluminum, Capacity 65 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-306; 1938. Aluminum Brown Bread Pot and Cover.

U. S. Gov., Veterans Administration. Specification VA-G-320; 1938. Tray; Round, Alumilite Finish.

U. S. Gov., Veterans Administration. Specification VA-G-321; 1938. Transfer Ladle.

U. S. Gov., Veterans Administration. Specification VA-G-322; 1938. Stock Pot; Aluminum, Capacity 15 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-323; 1938. Aluminum Rectangular Pan.

U. S. Gov., Veterans Administration. Specification VA-G-324; 1938. Stock Pot.

U. S. Gov., Veterans Administration. Specification VA-G-325; 1938. Rectangular Pan.

U. S. Gov., Veterans Administration. Specification VA-G-327; 1939. Rectangular Tub.

U. S. Gov., Veterans Administration. Specification VA-G-328; 1939. Bowl; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-329e; 1940. Servers; Coffee, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-330; 1939. Aluminum Cover.

U. S. Gov., Veterans Administration. Specification VA-G-331; 1939. Sauce Pot; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-336a; 1940. Corrosion-Resisting Steel Dipper.

U. S. Gov., Veterans Administration. Specification VA-G-337; 1940. Pan; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-338; 1940. Bowl; Aluminum, 1 Pint Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-339; 1940. Trays; Aluminum, Rectangular.

U. S. Gov., Veterans Administration. Specification VA-G-345a; 1941. Tray; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-346a; 1941. Tray; Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-347; 1940. Tray; Aluminum, for 13-Hole Rack.

U. S. Gov., Veterans Administration. Specification VA-G-348; 1940. Tray; Aluminum, for 15-Hole Rack.

U. S. Gov., Veterans Administration. Specification VA-M-280; 1938. Corrosion-Resisting Steel Drink Mixing Cups.

U. S. Gov., Veterans Administration. Specification VA-MC-303; 1939. Bowls for Vertical Type Mixers.

U. S. Gov., Veterans Administration. Specification VA-MM-284a; 1940. Food Container With Clamp Cover.

References.—Standard sizes of tinware, galvanized ware, and japanned ware, *see* 612.20; tin hollow ware, *see* 681.41; metal containers, *see* 951, 953.1, 954.21, 956; liquid and dry measures of iron or steel, *see* 919.1; cans of steel, *see* 959.1.

612.3 MISCELLANEOUS HOUSEHOLD UTENSILS

American Bakers Assn. Recommended Maximum Pan Lengths. For loaves weighing 12, 16, 20 and 24 oz. baked.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 47. Picks; Ice.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 49. Beaters; Egg.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 50. Dishers or Scoops, for Mashed Food, Ice Cream, etc.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 51. Skimmers; Perforated.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 57. Choppers; Food.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 63. Can Openers.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 80. Sharpener; Knife.

U. S. Gov., Federal Specification FF-O-601; 1942. Openers; Can. Covers three types—(I) household (single leverage operating, wing nut operating, with lever control); (II) household, mechanical (with wall attachment, with table attachment); and (III) institutional, with table attachment (medium size, large size). Gives requirements for materials and workmanship of each style and class; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification OO-M-18a; 1944. Machines; Chopping (Grinding), Meat. Covers two types—(I) hand operated, and (II) motor operated; in two classes—(A) intermittant duty and (B) continuous duty; and various sizes for type I and type II, classes A and B. Type II shall be furnished with or without pedestals. Gives requirements for condition, design, operation, chopper body, feed worm, knives, end plates, thrust bearing, accessibility, finish, marking, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-F-646; 1940. Amendment 1; 1944. Freezers; Ice-Cream, Hand-Operated. Covers one grade and three sizes—1, 2 1/2, and 5 gal. Gives requirements for material, workmanship, gears, beater, tinned steel or iron, construction, covers, tubs, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-G-681; 1940. Amendment 1; 1944. Griddles; Cast-Iron. Covers two types—(I) rectangular, and (II) round. Gives requirements for material, workmanship, design, coating, handles, construction, and sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-P-323; 1943. Picks; Ice. Covers one type and grade. Gives requirements for blade, handle, and finish; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Marine Corps Specification. 1918. Broiler.

U. S. Gov., Marine Corps Specification, 1904. Mill; Coffee.

U. S. Gov., Marine Corps Specification, 1933. Picks; Ice.

U. S. Gov., Navy Dept. Specification 64C6b; 1943. Cutters; Cake.

U. S. Gov., Navy Dept. Specification 64M8c; 1937. Machines; Vegetable Cubing and Slicing, Hand-Operated.

U. S. Gov., Navy Dept. Specification 6404c; 1943. Openers; Bottle (Shipboard Use).

U. S. Gov., Navy Dept. Specification 64P18a; 1944. Pans; Corn-Bread and Muffin, Iron (Cast).

U. S. Gov., Navy Dept. Specification 64S9; 1929. Squeezers; Lemon.

U. S. Gov., Navy Dept. Specification 64S11; 1941. Sponges; Metal.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-63; 1939. Opener; Can, Special.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-67; 1939. Cutter; Butter.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-73; 1939. Pick; Ice.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-76; 1939. Sieve; Flour, With Crank.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-79; 1939. Squeezer; Lemon.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-86A; 1940. Beater; Egg.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-88; 1939. Beef Juicer.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-89; 1939. Cutter; French Fry.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-98; 1939. Sieve; Flour, 16-Inch.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-120; 1941. Sharpener; Knife.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-60; 1942. Hanger; Outfit, Cooking, Calvalry, Pack.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-5a; 1944. Openers; Can (Mechanical). Shall be but one type, grade, and size. Gives requirements for materials, workmanship, construction, base plate, operating assembly, vertical shaft, cutting blade, feed gear, locking device, crank, finish, performance, spare parts, and marking; sampling, inspection, and method of test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-14; 1941. Choppers; Meat and Food, Hand-Operated. Type I—exterior shear cutters; type II—interior knife cutter; and there shall be but one grade. Gives requirements for materials, workmanship, condition, design, operation, body, feed worm, crank, marking, cutters, sizes, end plates, inspection, and method of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-43; 1941. Griddles; Cast Iron. Type I—oblong; type II—round; there shall be but one grade, and sizes shall be specified. Gives requirements for material, workmanship, casting, general designs, baking areas, coating, body, handles, sizes, tolerance, inspection, methods of test, and drawing.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-47; 1941. Skillets; Cast Iron. Skillets shall be but one type and grade, and sizes shall be as specified. Gives requirements for material, workmanship, casting, design, body, handle, finish, coating, inspection, methods of tests, and drawing.

U. S. Gov., Veterans Administration. Specification VA-G-9; 1932. Butter Cutter.

U. S. Gov., Veterans Administration. Specification VA-G-10-b; 1935. Butter and Cheese Cutter.

U. S. Gov., Veterans Administration. Specification VA-G-47-b; 1934. Ice Cream Dishers.

U. S. Gov., Veterans Administration. Specification VA-G-49; 1932. Picks; Ice.

U. S. Gov., Veterans Administration. Specification VA-G-174a; 1936. Pots; Stock, Deep, Aluminum, Capacity 25 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-175c; 1937. Pot; Stock, Aluminum, Capacity 60 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-177a; 1937. Pot; Stock, Deep, Aluminum, Capacity 100 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-178a; 1937. Pots; Stock, Deep, Aluminum, Capacity 60 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-179; 1936. Pot; Stock, Aluminum, Capacity 100 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-180; 1936. Pot; Sauce, Aluminum, Capacity 60 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-183; 1936. Colanders; Aluminum, Capacity 16 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-184a; 1937. Kettles; Preserving, Aluminum, Capacity 21 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-190; 1936. Measures; Lipped, Capacity 4 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-198a; 1938. Container; Liquid, Aluminum, Capacity 4 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-247; 1936. Pots; Stock, Deep, Aluminum, Capacity 140 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-293; 1938. Kettles; Preserving, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-316; 1938. Corer and Parer; Apple.

U. S. Gov., Veterans Administration. Specification VA-M-47; 1936. Hand Operated Bread Slicers.

U. S. Gov., Veterans Administration. Specification VA-M-88; 1934. Meat Grinders.

U. S. Gov., Veterans Administration. Specification VA-M-100; 1935. Food Separator; Hand Operated.

U. S. Gov., Veterans Administration. Specification VA-M-135a; 1936. Dish Racks.

U. S. Gov., Veterans Administration. Specification VA-M-158; 1935. Vegetable Slicing Machine.

U. S. Gov., Veterans Administration. Specification VA-M-334; 1944. Can Opener; Mechanical.

U. S. Gov., Veterans Administration. Specification VA-MC-317; 1942. Cake and Cookie Cutting Machine.

U. S. Gov., Veterans Administration. Specification VA-MC-327; 1942. Potato Soaking Vat.

References.—Tin hollow ware, *see* 681.41; metal and wooden pails, *see* 951.64, 951.65; metal and wooden tubs, *see* 951.71, 951.72; jars, *see* 955.4; brooms and brushes, *see* 981, 982; motor driven household devices, *see* 717.2.

613. METAL FURNITURE AND FIXTURES

613.1 BEDS, BED SPRINGS, COTS

American Hospital Assn., 1-1. Fracture Bed. For one type, one grade, and one class. Covers material and workmanship, general and detail requirements, and methods of inspections and tests. Based on U. S. Army Specification 10-2825 for Fracture Bed.

American Hospital Assn., 1-4. Hospital Beds. Covers one type, but subject to alternatives in connection with certain detail requirements. Based on U. S. Gov. Federal Specification AA-B-201.

American Hospital Assn., 1-7. Adjustable Spring-Bottom Hospital Beds. One type, but subject to alternatives in connection with certain detailed requirements. Covers material and workmanship, general and detail requirements, and methods of inspections and tests. Based on U. S. Gov. Federal Specification AA-B-211b for Adjustable Spring-Bottom Hospital Beds, referred to below.

American Hospital Assn., 1-25. Inner-Spring Mattresses. Three types—(I) springs in individual pockets, (II) all-wire spring unit, free-end coil construction, and (III) all-wire spring unit, knotted-coil construction. One grade.

American Hospital Assn., 1-28. Cotton-Felt Inner-Spring Mattresses. Type having springs in individual pockets.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R2-32; 1932. Bedsteads, Springs, and Mattresses. Bedsteads: This recommendation establishes a schedule of types and sizes of bedsteads covering straight-foot wood and metal beds. Sponsored by the National Assn. of Bedding Manufacturers and the National Assn. of Furniture Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R24-37; 1937. Hospital Beds. This recommendation establishes a simplified schedule of sizes and varieties of beds for general hospital use, institutional use, and private-room use. Sponsored by American Hospital Assn.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 6. Studio Couches; Twin.

U. S. Gov., Federal Specification V-M-96a; 1941. Mattresses; Inner-Spring. Covers one grade in three types—(I) springs in individual pockets, (II) all-wire spring unit, free-end coil construction, and (III) all-wire spring unit, knotted-coil construction. Covers requirements for felt, ticking, sheeting, sewing, thread, twine, tufting, twine or tape, seams stitching, casing mattress construction, edge construction, border construction, corners, lifting straps, labels, standard samples, contractors inspection, inner-spring construction, coils, folding, sizes, weights, and number of coils; methods of inspection and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification AA-B-201; 1933. Amendment 4; 1939. Beds; Hospital. Covers one type, but subject to alternatives in connection with certain detail requirements. Gives requirements for material and workmanship, construction, general dimensions, headpiece (continuous post, cross rods, upright rods, towel bar, irrigator attachment, welded connections), footpiece, corner lock, fabric and fabric frame (spring bottom), mosquito bar rods, and wooden shoes or casters; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-AA-B-201; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for finish, substituted zinc coating for tinned, and gave requirements for wooden shoes or casters.

U. S. Gov., Federal Specification AA-B-211b; 1940. Amendment 2; 1941. Beds; Hospital, Adjustable Spring-Bottom. Covers two types—(I) round tubing, and (II) square tubing. Gives general requirements for material and workmanship, construction, towel bar, irrigator attachment, welded connections, corner lock, adjustable spring bottom (main frame, adjustable spring-bottom frame, elevating mechanism, spring fabric), wooden shoes or casters, special tools, and manufacturer's name or trade-mark; detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-AA-B-211b; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirement for finish, substituted enamel for cranks in lieu of chromium plating and zinc coating for tinned, and gave requirements for wood shoes or casters.

U. S. Gov., Federal Specification AA-C-581a; 1940. Cots; Folding, Hospital, Steel. Covers one type. Gives requirements for ends, cross rods, steel caps, fabric frame, locking device, fabric, support, and canopy; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1939. Bedstead.

U. S. Gov., Marine Corps Specification, 1944. Bunk; Steel, Two Part Double Deck, Convertible Type.

U. S. Gov., Marine Corps Specification, 1935. Fabric, for Bedstead.

U. S. Gov., Marine Corps Specification, 1935. Fabric, for Steel Cot.

U. S. Gov., Navy Dept. Specification 26B1c; 1942. Beds; Stateroom.

U. S. Gov., Navy Dept. Specification 26B4; 1939. Bottoms; Wire, for Pipe Berths.

U. S. Gov., Navy Dept. Specification 26S3a; 1939. Springs; Berth (Built-In), Open-Box.

U. S. Gov., Navy Dept. Specification 57B3; 1925. Bottoms; Spring, Adjustable (Gatch Frame)

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2825A; 1942. Bed; Fracture.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 32-2A; 1941. Bedstead; Single, M-1938.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 32-7A; 1939. Cot; Folding, Steel.

U. S. Gov., U. S. Maritime Commission. Specification 26-MC-1; 1940. Springs; Open-Box for Built-In Berth. Shall be but one type and grade. Gives requirements for material, workmanship, cone-shaped springs, helical springs, finish, sizes, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 26-MC-8a; 1942. Berths; Stanchion- and Chain-Supported. Shall be type I—stanchion-supported; and type II—chain-supported. Type I shall be—class A single-tier berth; class B, double-tier berth; or class C, triple-tier berth. There shall be but one grade. Gives requirements for materials, workmanship, construction, finish, color, tolerances, number plate, sampling, inspection, test, and drawings.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-34; 1941. Amendment 1; 1942. Mattresses; Inner Spring. Shall be type I—all wire spring unit, free-end coil construction; type II—all wire spring unit, knotted-end coil construction; and shall be of but one grade. Gives requirements for sizes, felt, ticking, sheeting, spring wire, workmanship, distribution of felt, stitching, casing, tufting, mattress construction, edge construction, border construction, corners, lifting straps, labels, and details for each type; sampling, inspection, and methods of test; and packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-38; 1941. Mattresses; Inner Spring (Individual Pockets). There shall be but one type and grade, and the sizes shall be as specified. Gives requirements for materials, spring wire, workmanship, distribution of felt, stitching, casing, tufting, mattress construction, edge construction, border construction, inner spring construction, lifting straps, labels, sampling, inspection, and tests.

U. S. Gov., Veterans Administration. Specification VA-G-71c; 1939. Dormitory Beds.

U. S. Gov., Veterans Administration. Specification VA-X-185b; 1942. Springs for Hospital Sectional Mattresses.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-106c; 1943. Detachable Hospital Bedsides.

References.—Steel tubular goods, *see* 607.4; malleable cast iron, *see* 611.21; wooden beds and cots, *see* 431.11, 431.13.

613.2 BOOK CASES

References.—Iron and steel sheets, *see* 604.0, 604.22, 604.23.

613.3 CHAIRS AND STOOLS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R191-43; 1943. School Tables. Covers the standardization of sizes of school tables other than tables for science and vocational classrooms. Gives sizes and heights for individual pupil table, two-pupil table, general-purpose and library tables, lunchroom and project tables, bookkeeping table, typewriter table, and heights of chairs. Sponsored by the American Council on Education and the Interstate School Building Service.

U. S. Gov., Federal Specification AA-C-291; 1934. Amendment 1; 1934. Chairs; Folding, Metal. Covers four types—(A) tubing (electrically-welded or seamless), (B) double head, channel construction, (C) angle-iron construction, and (D) channel-iron construction; and five classes—(1) plywood seat and metal back, (2) padded seat and metal back, (3) padded seat and padded back, (4) slat-wood seat and metal back, and (5) metal seat and metal back. Gives requirements for material and workmanship, frame and legs, back support, stretchers, seat, and dimensions; method of inspection; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification AA-C-326; 1934. Amendment 2; 1944. Chairs; Operating, Dental, Motorless. Covers one type and one grade. Gives requirements for base, elevator mechanism, speed regulator, rotating mechanism, operating levers, metal castings, seat and back, arm rests, head rest, foot platform and toe plate, and finish; methods of inspection, tests, etc., packing and marking.

U. S. Gov., Federal Specification AA-S-691; 1943. Stools; Foot. Covers one type and two classes—(A) metal and (B) wood. Gives requirements for material, workmanship, dimensions, frame, top, legs, rubber tips, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 26C6f; 1940. Chairs; Aluminum (Shipboard Use).

U. S. Gov., Treasury Dept., Procurement Div., 204B. Chairs; Office, Metal, Rotary, Without Spring. Shall be of three types—(I) adjustable-back, with arms; (II) adjustable-back, without arms, padded seat; and (III) adjustable-back, without arms (wood seat). Gives requirements for upholstery, base, spindle and seat frame, back rest; back supporting frame, arms, and design; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 215. Chairs; Folding, Metal. Shall be of four types—tubing, double bead, angle iron, and channel iron construction. Gives requirements for construction, welding, frame and legs, back support, stretchers, seat, dimensions, and finish.

U. S. Gov., Treasury Dept., Procurement Div., 221B; 1937. Chairs; Office, Metal, Rotary, With Spring. Shall be of the adjustable spring-back type. Gives requirements for design, base, spindle and seat frame, seat, back, back supporting frame, and arms; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 244. Chairs; Folding, Metal (Channel-Construction, Double Bead, I—Beam-Type. Covers two classes with metal backs—(A) padded seat and (B) plywood seat. Gives requirements for material, workmanship, frame and legs, back support, stretchers, seat, dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 263A; 1938. Chairs; Office, Metal, Rotary, Posture Type. Shall be of four types, with three finishes—mahogany, olive-green, and walnut finish. Gives requirements as to material and workmanship, design, swivel, seat, back rest, arm rests, cushions, upholstery, and methods of sampling, inspection, and tests.

U. S. Gov., Treasury Dept., Procurement Div., No. 264; 1937. Chairs; Office, Metal, Rotary, Without Spring, With Ventilated Padded Back and Seat. Shall be of one type. Gives requirements for design, base, spindle and seat frame, seat, back, back supporting frame; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 340; 1939. Chairs; Office, Aluminum-Alloy. Covers six types—(I) leg type with arms, covered seat; (II) leg type without arms; (III) typists, swivel, without arms, adjustable spring back; (IV) swivel type, fixed back, with arms, covered seat; (V) swivel type, fixed back, without arms, covered seat; and (VI) swivel type, adjustable spring back, with arms, covered seat. Gives requirements for aluminum alloy, upholstery, glides, casters, assembling, finish, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 440; 1940. Chairs; Office, Metal, Rotary, Posture Type (Post Back). Covers eight types, with and without arms, in olive green, mahogany, and walnut (not grained) finishes. Gives requirements for material, metal thickness, design, base, spindle, seat, post back support, back rest, titling device, arm rests, casters or gliders, and upholstery covers; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-16; 1939. Stool; Revolving.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-39; 1939. Stool; Foot.

U. S. Gov., Veterans Administration. Specification VA-G-90; 1932. Steel Rocking Chair.

U. S. Gov., Veterans Administration. Specification VA-G-310b; 1942. Porch Chair; Spring Steel Frame.

References.—Wooden chairs and stools, *see* 435.2, 438.

613.4 DESKS

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-144. Desk and Equipment; High Speed Tel. Operators.

U. S. Gov., Federal Specification AA-D-191; 1931. Amendment 1; 1935. Desks; Steel. Covers seven types—flat-top, single-pedestal; flat-top, double-pedestal; flat-top, double; typewriter, drop-center, single-pedestal, flat-top; typewriter, drop-center, double-pedestal, flat-top; typewriter, double-pedestal, pedestal device, flat-top; and roll-top, double-pedestal. Gives requirements for material and workmanship, sizes, construction, finish, hardware, drawers, fittings, tops, sliding shelves, legs, panels, curtains or rolls, and typewriter beds; method of inspection and tests; and requirements for packing and marking. Emergency Alternate Federal Specification E-AA-D-191; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements to conform with U. S. Gov. Federal Specification AA-D-201; 1930, and Amendment 2; 1935, for Desks; Wood.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-44; 1939. Desk; Reception Room.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-47; 1941. Desk; Nurses'.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-33f; 1942. Double Pedestal Nurses' Chart Desk.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-34c; 1941. Nurses' Writing Desk.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-61a; 1938. Single Pedestal Nurses' Chart Desk.

References.—Sheet iron and steel, *see* 604.0, 604.22, 604.23; desk locks, *see* 617.21; wooden desks, *see* 435.3.

613.5 LOCKERS AND SAFES

American Hospital Assn., 34-103. Steel Clothes Lockers. Covers four classes in two types—single-tier and double-tier. Based on U. S. Gov. Federal Specification AA-L-486, for Steel Clothes Lockers, referred to below.

Safe Manufacturers' National Assn. Specification for Fire Insulated Safes, F1-D and F1-ND; 1939. For maximum protection of business records from fire and a definite measure of resistance to burglarious attack; three types based on fire resistance, and for F1-ND to explosion hazard also. Test methods for fire resistance, explosion hazard, and impact.

Safe Manufacturers' National Assn. Specification for Deposit Chute Containers, M1; 1939. Covers any safe container equipped with a deposit slot which is accessible from the exterior when door is closed. The slot voids any fire or burglary rating to which the product is otherwise entitled.

Safe Manufacturers' National Assn. Specification for Robbery-Resistive Containers, R1; 1939 For key-locked containers, such as lockers and trunk boxes, and wall safes not provided with deposit slot accessible when the door is closed; four types including Underwriters' label KL, round or rectangular door chests, wall safes, lockers, and truck boxes. Body and door thickness, materials, and locking mechanism.

Underwriters' Laboratories, Inc. Standard for Burglary-Resisting Safes and Relocking Devices, 1943. Covers burglary-resisting safes of five classes—tool-resisting safes (T-20); key-locked safes (KL); explosive-resisting safes (X-60); torch-resisting safes (TR-60); and torch and explosive-resisting safes (TX-60); and gives design, performance, samples, and test methods for each class. Also, covers design and construction, reliability of operation, strength, and performance of relocking devices. Gives requirements for operation, maintenance, durability, protection against corrosion, strength, uniformity, marking, inspection of listed product, and instructions to inspectors.

Underwriters' Laboratories, Inc. Standard for Fire Resistance Classification of Safes and Insulated Cabinets, 1941. General classification, design and construction, fire endurance test, fire-and-impact and explosion-hazard test, and inspection of listed products.

Underwriters' Laboratories, Inc. Standard for Timelocks (Burglary and Robbery), 1934. Covers automatic and manual setting timelocks for safes, chests, and vaults. Requirements as to practicability of design, durability, positive operation, minimum time delay, workmanship, and marking.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-391. Locker; Counter High, Work Bench.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R35-44; 1944. Steel Lockers (Single, Double, and Multiple Tier). This recommendation applies to steel lockers generally used in washrooms, rest rooms, gymnasiums, and schools for the storage of clothing and personal property. Gives tables of recommended stock sizes for single-tier, double-tier, and multiple-tier lockers showing width, depth, and height for various sizes. Sponsored by the Steel Locker Council.

U. S. Gov., Federal Specification AA-C-31; 1932. Cabinets; Stationery, Storage, and Clothing (Steel). Covers six types—(I) single-door clothing; (II) double-door clothing, (III) single-door stationery and storage, (IV) double-door stationery and storage, (V) janitor's single-door storage, and (VI) janitor's double-door storage. Gives requirements for material, workmanship, construction, finish, sizes, interior equipment, shelves, doors, latching mechanism, and gages of parts; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Federal Specification AA-L-486; 1932. Amendment 2, 1941. Lockers; Clothes, Steel. Covers two types—(I) single-tier, and (II) double-tier; and four classes—(a) semi-louvered door, (b) full-louvered door, (c) full-perforated door, and (d) open-mesh "tropical." Gives requirements for steel, sheets, hardware, units, strength and rigidity, number plates, locks, finish, sizes, interior equipment, doors, hinges, latching mechanism, and gages; method of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Federal Specification AA-S-71; 1930. Amendment 3; 1936. Safes; Burglar-Resisting. Covers two types—(A) offering resistance to edge-cutting tools, explosives, and heat destruction by oxyacetylene torch or other heat devices; (B) of the same type but having a higher degree of resistance to heat destruction by oxyacetylene torch or other heat devices. Gives requirements for material, workmanship, dimensions, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification AA-S-81a; 1941. Safes; Insulated. Covers three classes—(A) having 4-hour heat resistance, (B) having 2-hour heat resistance, and (C) having 1-hour heat resistance. Requirements are substantially the same as those of the Underwriters' Laboratories. Gives requirements for material, workmanship, construction, and heat resistance; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification GG-S-751a; 1940. Sterilizers; Accessories and Portable Lockers (for Sterilizers). Covers five types—(I) dressing sterilizers, (II) instrument sterilizers (pressure and boiling), (III) utensil sterilizers (pressure and boiling), (IV) water sterilizers, and (V) combination sterilizers; accessories for pressure sterilizers; and lockers for use with combination sterilizers. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Marine Corps Specification 1944. Safe; Field, M-1942.

U. S. Gov., Navy Dept. Specification 26F4d; 1939. Furniture; Lockers, Clothes, Steel and Aluminum (Shipboard Use).

U. S. Gov., Navy Dept. Specification 26S4a; 1944. Safes; Burglar-Resisting.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 1-33; 1938. Safe; Field.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1375; 1942. Chest CF-76.

U. S. Gov., U. S. Maritime Commission. Specification 26-MC-3; 1941. Safes; Insulated. Shall be of the fire-insulated type, in but one grade and one class, of the size based on the available space. Gives requirements for materials, workmanship, construction, rollers, insulation, doors, locking requirements, locking mechanism, finish, structural strength, fire resistance, explosion hazard test, impact resistance, safe labels, sampling, inspection, and tests.

U. S. Gov., U. S. Maritime Commission. Specification 26-MC-11; 1943. Strongboxes. Shall be but one type, grade, and size. Gives requirements for sheet steel, workmanship, construction, handles, hardware, weight, finish, sampling, inspection, test, and drawing.

References.—Masonry vaults, *see* 518.59; sheet iron and steel, *see* 604.0, 604.21, 604.22; terneplate, *see* 604.31.

613.6 TABLES

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-38; 1928. Telegraph Table. Describes construction of steel framed table with top of oak veneer on chestnut core, with drawings showing dimensional requirements and details.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-39; 1928. Dispatchers' Tables. Includes single and double position tables made from steel angles and metallic furniture stock, with linoleum top, steel shelves and drawers, bronze hardware, and dimensional drawings of assembly and detail requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-40; 1928. Table Rail. For use on telegraph table, 1 1/2 in. square oak railing and supports, steel bolts and sockets, enamel finish on exposed metal, and varnished wood finish, with drawings of construction details.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-42 and 2-G-43; 1929. Apparatus Shelf AAR-1-A and AAR-2-A. Requirements as to material and method of construction of wooden shelf with angle iron supports for mounting on standard telegraph tables AAR-1-A and AAR-2-A, respectively; requirements for five-ply veneer of oak with chestnut core, varnish finish, and enameled metalwork, with dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-49; 1929. Telegraph Table AAR-2-A. For table assembled of two end units, and intermediate unit for increasing the length by 3 1/2 foot increments; requirements for steel framework, wood tops of oak veneer on chestnut core, typewriter drop, list of parts and finish, with dimensional drawings of assembly and details.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-64; 1931. Unit Set Repeater Table AAR-2-B. For mounting telegraph equipment or other apparatus requiring supervision by repeater attendants; requirements for design, construction, and finish, with bill of materials and 30 working drawings for table of sheet steel, angles, castings, and wood.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-66; 1931. Movable Apparatus Table AAR-1-A. For wood top table mounted on steel frame and casters, quality of materials, and working drawings.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-336. Printing Telegraph Unit Metal Table, for Mounting Page Type, per CAA-331.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-337. Printing Telegraph Table; Metal, for Mounting Transmitter-Distributor Units, per CAA-334 and CAA-335.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-338. Printing Telegraph Table; Metal, for Mounting Transmitter-Distributor Units, per CAA-332 and CAA-335.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-512. Operator's Tables (Point-to-Point Radio Communication Facility).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R191-43; 1943. School Tables. Covers the standardization of sizes of school tables other than tables for science and vocational classrooms. Gives sizes and heights for individual pupil table, two-pupil table, general-purpose and library tables, lunchroom and project tables, bookkeeping table, typewriter table, and heights of chairs. Sponsored by the American Council on Education and the Interstate School Building Service.

U. S. Gov., Federal Specification AA-T-91; 1933. Tables; Office, Steel. Covers flat-top steel tables for office use. Gives detail requirements and methods of inspection; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 26T1c; 1944. Tables; Card, Metal.

U. S. Gov., Treasury Dept., Procurement Div., No.205. Pedestal Type Metal Dining Room Table. Gives requirements as to dimensions, construction, top, base, pedestal uprights, adjustable glides, and finish.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-12; 1940. Table; Imposing, Steel Lockup and Storage, for Print Shop. Type I—size 31 x 39 in.; type II—size 39 x 65 in.; and the tables shall be all steel as specified herein. Gives requirements for materials, workmanship, finish, color, base construction, detail requirements, dimensions, tolerances, inspection, and methods of test.

U. S. Gov., Veterans Administration. Specification VA-G-121a; 1937. Diet Kitchen Dish Tables.

U. S. Gov., Veterans Administration. Specification VA-G-312c; 1942. Steel Porch Table.

U. S. Gov., Veterans Administration. Specification VA-GC-103j; 1942. Tables; Cook, Metal Top.

U. S. Gov., Veterans Administration. Specification VA-GC-111g; 1942. Diet Kitchen Tables.

References.—Iron and steel sheets, *see* 604.0, 604.22, 604.23; wooden tables, *see* 431.51, 435.3.

613.7 FILING FURNITURE

American Hospital Assn., 49-7. Steel Transfer Cases. Covers four types. Based on U. S. Gov. Federal Specification AA-C-121 for Steel Transfer Cases, referred to below.

American Hospital Assn., 49-22. Steel Sectional Office Furniture and Cabinets. Covers six types in four finishes. Based on U. S. Gov. Federal Specifications AA-F-791b for Steel Sectional Office Furniture and Cabinets, DD-G-451 for Flat Glass for Glazing Purposes, and QQ-M-151a for General Specification for Inspection of Metals.

Safe Manufacturers' National Assn. Specification for Fire Insulated Containers, F2-ND; 1939. For efficient handling of records at point of use, and to provide a measure of fire protection; three types based on fire resistance, method of fire, and impact-resistance tests.

U. S. Gov., Federal Specification AA-C-23; 1942. Amendment 1; 1944. Cabinets; Filing, Insulated, Fire-Resisting. Covers two classes—(D) having 1 hr. fire resistance, and (E) having 1/2 hr. fire resistance. Gives requirements for material, workmanship, insulation, supports, closure details, latches, lock, finish, sizes, structural strength, fire resistance, and weights; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification AA-C-121; 1932. Amendment 1; 1935. Cases; Transfer, Steel. Covers four types—(I) for invoice-size papers, (II) for letter-size paper, (III) for cap-size paper, and (IV) for sheets 10 by 16 in. Gives requirements for material and workmanship, finish, case body, drawers, and leg bases; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification AA-F-791b; 1937 Amendment 2; 1944. Furniture and Cabinets; Office, Sectional, Steel. Covers six types—(I) cabinets, card size; (II) sections, horizontal; (III) sections, horizontal, base; (IV) sections, horizontal, base, truck; (V) sections, horizontal, bookcase; and (VI) sections, upright; and four finishes—(A) mahogany, (B) oak-quartered, (C) olive-green, and (D) walnut. Gives requirements for material; workmanship; finish; bolts, nuts, screws; pulls, label holders, rod heads; latches, door knobs; upright section; drawer suspension; drawers; locks; ball suspension; compressors; tolerances; marking; spot welds; and assembly, dimensions, top and base sections, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Iron and steel sheets, *see* 604.0, 604.22, 604.23; wooden filing furniture, *see* 435.5.

613.9 MISCELLANEOUS METAL FURNITURE AND FIXTURES

American Hospital Assn., 4-46. Steel Storage Shelving. Covers two types—(A) with closed backs, ends, bases, and common partitions between units or bays, and with or without doors as specified; (B) with closed ends, back, and bases; intermediate sides, open; (C) with closed ends; intermediate sides, and bases—open backs; (D) with closed ends and bases—open backs and open intermediate sides; and (E), open (skeleton) shelving. Based on U. S. Gov. Federal Specification AA-S-271a for Shelving; Steel, Storage.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-45; 1929. Train Order Table Top AAR-1-A. For use in conjunction with one main and one intermediate unit framework telegraph table AAR-2-A, oak veneer top with chestnut core, varnish finish, and dimensional requirements.

Assn. of Lift Truck and Portable Elevator Manufacturers. Specifications for Storage Racks. Covers structural features including panels, skid rails, accessories, and spacing; for drum and barrel racks, loaded skid platform racks, die racks, etc.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Dry Cleaning Department, 1940. Includes recommendations for garment storage racks—sizes, spacings and arrangement of posts, flanges, and brackets.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Rooms, Cabinets, and Outside Houses for the Storage of Flammable Liquids. Covers standards for the construction of inside storage or mixing room, storage cabinets, and outside storage houses.

Steel Kitchen Cabinet Institute. Quality Standards for Steel Kitchen Cabinets, 1940. Approval requirements covers: Section 1—gages; section II—construction of cabinets including body, welding, doors and drawers, exposed surfaces, and hardware; section III—performance tests for rigidity including drawers, wall cabinets, squeeze tests, load tests, three-point test for doors, squeeze tests for base cabinets, hinge test, and door catches and hinges; section IV—finish specifications including preparation and material; section V—tests for cabinet finishes including water immersion, impact, humidity, salt spray, draw, abrasion, alcohol, hot fat, scratch hardness, and weatherometer tests; and section VI—equipment and conditions for finish tests.

Underwriters' Laboratories, Inc. Standard for Fire Resistance Classification of Safes and Insulated Cabinets, 1941. General classification, design and construction, fire endurance test, fire-and-impact and explosion-hazard test, and inspection of listed products.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R182-41; 1941. Food Service Equipment. This recommendation is concerned not only with the sizes and dimensions of complete units of equipment but also with the details of construction. Initiated by the food service equipment industry.

U. S. Gov., Federal Specification AA-S-271a; 1941. Amendment 1; 1941. Shelving; Steel, Storage. Covers five types—(A) closed shelving with closed backs, sides, ends, and with or without doors; (B) shelving with closed ends, backs, and bases; (C) shelving with closed ends and bases, open backs; (D) shelving with closed ends and bases, open backs and open intermediate sides; and (E) open or skeleton shelving; and three classes—(1) light loads, (2) heavy loads, and (3) extra heavy loads. Gives requirements for material, workmanship, gages, construction, finish, hardware, and accessories; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification AA-S-671; 1935. Stands; Dictionary. Covers two types—(I) pedestal-style, and (II) rotary-bookcase-style. Gives requirements as to base, casters, construction, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification FF-C-81; 1937. Casters; Metal-Chair. Covers two types—(I) ball-bearing swivel casters, and (II) top-bearing swivel casters; two sizes—(A) wheel 1 5/8-in. diameter, and (B) wheel 2-in. diameter; and four-wheel. Wheel materials—(1) hard-rubber composition, (2) hard-rubber composition with soft-rubber tread, (3) hard-rubber, and (4) phenolic composition. Covers material and workmanship; general requirements; detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification FF-C-91a; 1937. Casters; Wood-Chair. Covers two types—(I) ball-bearing swivel, and (II) top-bearing swivel; two sizes—1 5/8-, and 2-in. diameter wheels; and four materials—hard-rubber composition, hard-rubber composition with soft-rubber tread, hard-rubber, and phenolic-composition. Covers material and workmanship; general requirements; detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-FF-C-91a; 1943, (issued by Procurement Div., Treasury Dept., U.S. Gov.) changed type, wheel composition, bearings, and tests.

U. S. Gov., Navy Dept. Specification 30R5; 1943. Rings; Toilet-Set (Crockery, Stateroom).

U. S. Gov., Treasury Dept., Procurement Div., No.348; 1939. Stands; Smoking. Covers two types—(I) full-rocking and (II) semi-rocking; and are constructed of metal. Gives requirements for tray, bowl, base, stem, snuffer-dips, finish, weight and size; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-22A; 1941. Dresser; Steel.

U. S. Gov., U. S. Maritime Commission. Specification 30-MC-1a; 1941. Holders; Berth Cup. Type I—corrosion-resisting steel; type II—tin plate; type III—aluminum; type IV—enamelware; and grade shall be as specified herein. Gives requirements for materials, workmanship, general construction, metal, tolerances, color, dimensions, sampling, inspection, methods of test, and drawings.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-2; 1940. Cabinet; Wall Type, Steel, for Print Shop. Type I—single-tier (24-case); type II—double-tier (48-case); and the grade shall be as specified. Gives requirements for materials, workmanship, finish, color, base construction, movable parts, top, back, overhead lighting fixture, body, working top, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-4; 1940. Cabinet; Letter-board (for Standing Forms), for Print Shop. The cabinet shall be all steel and the grade shall be as herein specified. Gives requirements for materials, workmanship, finish, color, base construction, dimensions, openings, letter-boards, inspection, and methods of test.

U. S. Gov., Veterans Administration. Specification VA-G-95; 1933. Steel Library Shelving.

U. S. Gov., Veterans Administration. Specification VA-G-104c; 1936. Waste Receptacles.

U. S. Gov., Veterans Administration. Specification VA-G-247; 1936. Pots; Stock, Deep, Aluminum, Capacity 140 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-311c; 1942. Porch Glider.

U. S. Gov., Veterans Administration. Specification VA-G-342; 1941. Chrome Plated Furniture (General Service).

U. S. Gov., Veterans Administration. Specification VA-GC-359; 1942. Drawer Type Proofers.

References.—Iron and steel sheets, *see* 604.0, 604.22, 604.23; metal waste baskets, *see* 932.3.

614. STOVES AND FURNACES, EXCEPT ELECTRIC

614.0 GENERAL ITEMS

American Gas Assn. Requirements and Recommended Practice for House Piping and Appliance Installation, 1940. These requirements should be construed as basic standards governing the installation of house piping and gas appliances and they have been prepared to specify results rather than outline in detail how such results shall be obtained. Covers general requirements for house piping, recommended practice for house piping, recommended practice for gas meters, general requirements for appliance installation, recommended practice for appliance installation, recommended practice for flue connections, and appendix.

American Gas Assn. American Standards Assn., Z21.12-1937. Listing Requirements for Draft Hoods. Includes—part I, construction requirements; part II, performance requirements for use with gas converted central heating equipment; part III, performance requirements for use with gas water heaters and with gas converted water heating equipment; and appendix; definitions, dimensions for vertical draft and horizontal draft hoods.

American Gas Assn. American Standards Assn., Z 21.13-1943. Approval Requirements for Central Heating Gas Appliances. Includes—part 1, construction requirements for use with all gases; part II, performance requirements, gas boilers for use with natural and manufactured gases; part III, performance requirements, gas boilers for use with liquefied petroleum gases; part IV, performance requirements, gas boilers for use with butane-air gas; part V, construction requirements, gas warm air furnaces for use with all gases; part VI, gas warm air furnaces for use with natural and manufactured gases; part VII, gas warm air furnaces for use with liquefied petroleum gases; part VIII, gas warm air furnaces for use with butane-air gas; part IX, construction requirements, gas floor furnaces for use with all gases; part X, gas floor furnaces for use with natural and manufactured gas; part XI, gas floor furnaces for use with liquefied petroleum gases; and part XII, gas floor furnaces for use with butane-air gas; and appendix; definitions, arrangement of apparatus for testing, and types of lock seams considered acceptable.

American Gas Assn. American Standards Assn., Z 21.15-1942. Listing Requirements for Gas Valves. Represents basic standards for safe operation, substantial and durable construction, and acceptable performance for gas valves. Addenda to American Standard Listing Requirements for Gas Valves, effective Jan. 1, 1944.

American Gas Assn. American Standards Assn., Z21.24-1941. Listing Requirements for Semi-Rigid Gas Appliance Tubing and Fittings. Construction and performance requirements including dimensions for tubing; compression and flared type connectors, unions, elbows, tees, and nuts; and compression type ball sleeves and nuts.

American Gas Assn. American Standards Assn., Z21.29-1941. Listing Requirements for Furnace Temperature Limit Controls and Fan Controls. Requirements represent minimum standards for the performance, safe operation, and substantial and durable construction of gas appliance accessories.

American Society of Heating and Ventilating Engineers. Heating, Ventilating, Air Conditioning Guide, 1944. Contains a technical data section of reference material on the design and specification of heating, ventilating, and air conditioning systems based on—the transactions, the investigations of the research laboratory and cooperating institutions, and professional practice. Includes principles of thermodynamics of air and water mixtures, physiological principles, heating and load calculations, combustion, steam and hot water heating, air conditioning, automatic controls, instruments, and motors. Also special applications such as drying systems, industrial and transportation air conditioning, etc.

American Society of Heating and Ventilating Engineers. Performance Test Code for Steam Heating Solid Fuel Boilers—Code 3; 1929. Specifies the tests to be conducted and provides a standard method for conducting and reporting tests to determine the efficiencies and performance of the boiler. Intended for use with A.S.H.V.E. Code for Rating Steam Heating Solid Fuel Hand Fired Boilers, referred to herein. Includes arrangement of apparatus, table of fuels, tests to be conducted, boiler room log sheets, starting and stopping of test, heating boiler test report forms, and explanation of use of log sheets and test report forms.

American Society of Heating and Ventilating Engineers. Standard and Short Form Heat Balance Codes for Testing Low-Pressure Steam Heating Solid Fuel Boilers—Codes 1 and 2; 1929. A standard method for conducting and reporting tests to determine the heat efficiency and performance characteristics. The code recognizes that tests of boilers may be made under different conditions, for different purposes, and with complete or limited facilities for conducting the test. It is designed to cover the determination of a complete heat balance; if a less complete test is required to satisfy the objectives of the test, observations not required can be omitted. Includes definitions, set up of boiler to be tested, instruments and measuring apparatus, fuel sampling, duration of tests, starting and stopping tests, methods of conducting tests, tables of data and results of tests, and computations for tests.

American Society of Heating and Ventilating Engineers, and Industrial Unit Heater Assn. Standard Code for Testing and Rating Steam Unit Heaters, 1930. Prepared jointly by both organizations. Covers definitions, basis of rating, test procedure, equipment necessary, computations of results, and diagrams of test set-ups.

Anthracite Industries, Inc. Approval Code for Domestic Surface Fired Boilers, 2075A. Requirements for shipments to be complete in one lot, boilers designed for erection with standard plumber's tools, for gas-tight joints, jacket design, maximum size of parts, for removable grates, damper arrangement, adaptability to thermostatic control, area of grate openings, ash pit design, adaptability to automatic fuel burners, insulation, design and furnace and heat absorbing surfaces, and for access doors.

Anthracite Industries, Inc. Laboratory Approval Requirements for Anthracite Tank Heaters, 2075-C. For approval of tank heaters only when used in conjunction with an approved temperature regulator and pressure relief valve. Requirements for grate type and design, fuel and fuel capacity, rating, and determination of performance ability.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 14.45; 1938. Testing Procedure for Oven Safety Devices. Frequent tests help assure safety of equipment and operation. Covers explosions, show need of inspections, test inspections, arranging for the inspection, types of oven safety devices, testing the devices, common trouble, and reporting the inspection.

Institute of Cooking and Heating Appliance Manufacturers. Flue-Connected Oil-Burning Space Heaters. Tentative Standards, 1940. Includes methods for selecting proper size heater using calculated heat loss; and rapid method using construction, design, temperature, volume, and constant obtained from zone map.

Institute of Cooking and Heating Appliance Manufacturers. Flue-Connected Oil-Burning Space Heaters. Tentative Standards, 1940. Includes oil heater rating tests, standard Underwriters' booth, requirements for instruments, heating values of fuels, test procedures, and computations, with plates illustrating equipment.

National Board of Fire Underwriters. Oil Burning Equipments, No. 31; 1941. Standards for installation in furnaces and boilers for heating dwellings, and various commercial and industrial applications. Covers application and scope, approval of plans, approved burners, fuel oil, gravity feed to burners, pressure tank feed, installation of underground tanks, installation of tanks inside buildings, installation of outside aboveground tanks, setting of tanks, construction of tanks, tank vents, tank fill and overflow pipes, oil gaging, oil pumps, piping, valves, preheating of oil, tests of tanks and piping, oil burner controls, electric wiring and equipment, installation of burner, and appendix.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Oil Burner Ordinance, Detailed Form (for Power and Heating Installations). Suggested ordinance regulating installation and operation of oil burning equipments and oil storage in connection therewith. Gives definitions, requirements for approved equipment, installation of tanks, vents, gaging, piping, valves, pumps, preheaters, controls, wiring, and installation of burner.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Oil Burner Ordinance, Short Form. Suggested ordinance for municipalities regulating oil burning equipments and oil storage in connection therewith.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Oil Burning Equipment. Apply to oil-burning equipments for installation in furnaces and boilers used for heating dwellings and for various commercial and industrial applications. Covers the installation of the oil burners and all equipment connected thereto, including tanks, piping, pumps, control devices, and all accessories.

Stoker Manufacturers Assn. Code for Determination of Rated Capacities of Anthracite Underfeed Stokers, 1944

To establish a uniform method of rating anthracite underfeed stokers having a nominal capacity of 1,200 lb./hr. coal feed or less. Gives scope, usage, identification, advertising, qualifications, guarantee, revisions, violations, and chart showing overfire draft inches of water.

Stoker Manufacturers Assn. Code For Determination of Rated Capacities of Bituminous Underfeed Stokers, 1944. To establish a uniform method of rating bituminous single retort underfeed stokers having a nominal capacity of 1,200 lb./hr. coal feed or less. Gives scope, usage, identification, advertising, qualifications, guarantee, revisions, violations, and chart showing overfire draft inches of water.

Underwriters' Laboratories, Inc. Bulletin of Research, 27; 1943. Clearances and Insulation of Heating Appliances. This bulletin describes tests conducted to provide definite technical information as a basis for promoting uniformity in the various ordinances, regulations, and standards bearing on the subject. Covers mechanism of heat transfer, test equipment, tests of protective assemblies, temperature measurements, test procedure, test results, and comments.

614.1 COAL STOVES AND RANGE BOILERS

Anthracite Industries, Inc. Requirements for Approval of Cooking Ranges, 2075B. Covers hand-fired, stoker-fired, or magazine fed cooking ranges; specifies oven temperature, banking condition, construction, safety, convenience, fuel intervals, controls, area of cooking top, and efficiencies.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R8-42; 1942. Range Boilers and Expansion Tanks. This establishes a schedule of sizes and capacities of black iron and galvanized range boilers and expansion tanks, diameters and lengths, gallon capacity, construction, working pressure, and tappings. This publication issued in accordance with War Production Board's Limitation Order L-199.

U. S. Gov., Navy Dept. Specification 45I2c; 1937. Indicating-Systems; Tank-Level (Static-Head Type).

U. S. Gov., Navy Dept. Specification 64R5a; 1934. Ranges; Navy Standard, Coal-Burning.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-9; 1938. Boiler; Range, Army Field, With Cover.

References.—Installation rules, *see* 614.0; unfired pressure tanks, *see* 605.23; other tanks, *see* 956.2; house heating boilers, coal burning, *see* 614.4; coal burning tank heaters, *see* 614.9.

614.2 GAS STOVES, RANGES, AND WATER HEATERS

American Gas Assn. American Standards Assn., Z21.1-1942. Approval Requirements for Domestic Gas Ranges. Includes—part I, construction requirements, domestic ranges for use with all types of gases; part II, performance requirements, domestic ranges for use with natural and manufactured gases; part III, performance requirements, domestic gas ranges for use with liquefied petroleum gases; part IV, performance requirements, domestic ranges, for use with butane-air gas; and appendices on definitions, classifications, arrangement of apparatus for determining strength of gas range bodies and stability of pilot and bypass flames.

American Gas Assn. American Standards Assn., Z 21.1 ES-1942. Approval Requirements for Domestic Gas Ranges (American Emergency Standard). Includes—part I, construction requirements, domestic ranges for use with all gases; part II, performance requirements, domestic ranges for use with natural and manufactured gases; and appendix.

American Gas Assn. American Standards Assn., Z21.3-1940. Approval Requirements for Hotel and Restaurant Ranges and Unit Broilers, effective Jan. 1, 1941. Construction requirements for use with all gases. Performance requirements for use with natural and manufactured gases, liquefied petroleum gases, and butane-air gas.

American Gas Assn. American Standards Assn., Z21.4-1932. A.G.A. Approval Requirements for Private Garage Heaters. Construction and performance requirements with appendix on minimum acceptable dimensions for plug type gas cocks.

American Gas Assn. American Standards Assn., Z21.5-1940. Approval Requirements for Clothes Dryers. For gas heated dryers of cabinet type and rack type, requirements on thicknesses of metal parts, dimensions of cocks, sizes of clothes rods, structural features of dryer, test requirements for burner operation, temperature limiting devices, pilot, heating capacity, drying efficiency, fire hazard, draft hoods, etc.

American Gas Assn. American Standards Assn., Z21.6-1932. A.G.A. Approval Requirements for Incinerators. Requirements on thickness of metal parts, materials and construction of parts, strength of incinerator, gas burner construction, test requirements for burner and pilot operation, incinerating efficiency, leakage, and fire hazard.

American Gas Assn. American Standards Assn., Z21.7-1932. A.G.A. Approval Requirements for Gas Heated Ironers. Construction requirements for burners, cocks, combustion chamber, thickness of metal, stability requirements, test requirements for burner operation, heat distribution, pressure distribution, explosion and fire hazards, ironer operation, and efficiency.

American Gas Assn. American Standards Assn., Z21.8-1940. Requirements for Installation of Conversion Burners in House Heating and Water Heating Appliances. Includes requirements on ventilation, flues, heating surfaces, doors, burners and controls, piping and meters, and inspections and tests; and includes definitions, general dimensions for vertical and horizontal draft hoods, and minimum flue sizes.

American Gas Assn. American Standards Assn., Z21.9-1940. Approval Requirements for Hot Plates and Laundry Stoves. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; and appendix, definitions and hose end nozzle.

American Gas Assn. American Standards Assn., Z21.10-1944. Approval Requirements for Gas Water Heaters. Includes—part I, construction requirements for all types of water heaters; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; and appendix, definitions, dimensions for plug type burner valves, arrangement of apparatus for testing.

American Gas Assn. American Standards Assn., Z21.11-1942. Approval Requirements for Gas Space Heaters. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases, part IV, performance requirements for use with butane-air gas; and appendix, definitions and hose end nozzle.

American Gas Assn. American Standards Assn., Z21.14-1934. Approval Requirements for Industrial Gas Boilers. Represents minimum standards for performance, safe operation, and substantial and durable construction.

American Gas Assn. American Standards Assn., Z21.15-1942. Listing Requirements for Gas Valves. Represents basic standards for safe operation, substantial and durable construction, and acceptable performance for gas valves. Addenda to American Standard Listing Requirements for Gas Valves, effective Jan. 1, 1944.

American Gas Assn. American Standards Assn., Z21.16-1940. Approval Requirements for Gas Unit Heaters. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; and appendix, definitions.

American Gas Assn. American Standards Assn., Z21.17-1940. Listing Requirements for Gas Conversion Burners. Includes—part I, construction requirements atmospheric and power conversion burners for use with all gases; part II. performance requirements atmospheric and power conversion burners for use with natural and manufactured gases; part III, performance requirements (added) conversion burners for use with liquefied petroleum gases; part IV, performance requirements (added) conversion burners for use with butane-air gas; and appendix, definitions.

American Gas Assn. American Standards Assn., Z21.18-1934. Listing Requirements for Domestic Gas Appliance Pressure Regulators. Represents minimum standards for the performance, safe operation, and substantial and durable construction of gas appliance accessories. Revisions to this standard have been issued by the American Gas Assn., effective June 15, 1935, and July 8, 1938.

American Gas Assn. American Standards Assn., Z21.20-1940. Listing Requirements for Automatic Pilots. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; and appendix, definitions.

American Gas Assn. American Standards Assn., Z21.21-1935. Listing Requirements for Automatic Main Gas-Control Valves. Represents minimum standards for the performance, safe operation, and substantial and durable construction of gas appliance accessories.

American Gas Assn. American Standards Assn., Z21.22-1935. Listing Requirements for Relief and Automatic Gas Shut-Off Valves for Use on Water Heating Systems. Includes construction requirements; performance requirements on pressure relief valves, pressure relief elements of combination valves, temperature relief valves, temperature relief elements of combination valves, vacuum relief valves, and vacuum relief elements of combination valves; definitions; and arrangement of apparatus for testing temperature relief valves.

American Gas Assn. American Standards Assn., Z21.23-1940. Listing Requirements for Gas Appliance Thermostats. Includes construction requirements; performance requirements for liquid immersion, gaseous immersion, and surface contact thermostats; and definitions.

American Gas Assn. American Standards Assn., Z21.25-1937. Approval Requirements for Gas Hair Dryers. Represents minimum standards for performance, safe operation, and substantial and durable construction for gas hair dryers for use with natural, manufactured, propane, and butane-air gases.

American Gas Assn. American Standards Assn., Z21.26-1941. Listing Requirements for Attachable Gas Water Heating Units. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; and appendix, definitions, dimensions for plug type gas burner valves, and arrangements of apparatus for determining thermal efficiency and heat losses from storage vessels.

American Gas Assn. American Standards Assn., Z21.27-1940. Approval Requirements for Hotel and Restaurant Deep Fat Fryers; effective Jan. 1, 1941. Construction and installation requirements for use with all gases. Performance requirements for use with natural and manufactured gases; liquefied petroleum gases and butane-air gas.

American Gas Assn. American Standards Assn., Z21.31-1941. Approval requirements for Gas Counter Appliances. Represents basic standards for safe operation, substantial and durable construction, and acceptable performance for gas counter appliances. Includes—part I, construction requirements for use with all gases; part II, performance requirements, coffee brewers and coffee urns for use with natural and manufactured gases; part III, performance requirements, coffee brewers and urns for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; part V, performance requirements, food and dish warmers for use with natural and manufactured gases; part VI, performance requirements, food and dish warmers for use with liquefied petroleum gases; part VII, performance requirements, food and dish warmers for use with butane-air gas; part VIII, performance requirements, gas waffle bakers for use with natural and manufactured gases; part IX, performance requirements, gas waffle bakers for use with liquefied petroleum gases;

part X, performance requirements, gas waffle bakers for use with butane-air gas; part XI, performance requirements, hot water immersion sterilizers, for use with natural or manufactured gases; part XII, performance requirements, hot water immersion sterilizers for use with liquefied petroleum gases; part XIII, performance requirements, hot water immersion sterilizers for use with butane-air gas; part XIV, performance requirements, commercial hot plates and griddles for use with natural and manufactured gases; part XV, performance requirements, commercial hot plates and griddles for use with liquefied petroleum gases; part XVI, performance requirements, commercial hot plates and griddles for use with butane-air gas; and appendix, definitions.

Non-Ferrous Hot Water Tank Manufacturers Assn. Non-Ferrous Range Boilers and Hot Water Storage Tanks Used for Heating Water or Storing Water Under Street Pressure, 1940. Definitions and general requirements for rating, pressure, dating, tolerance, workmanship, solder, and pressure, vacuum, rupture, and pulsating tests.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation, R8-42; 1942. Range Boilers and Expansion Tanks. This establishes a schedule of sizes and capacities of black iron and galvanized range boilers and expansion tanks, diameters and lengths, gallon capacity, construction, working pressure, and tappings. This publication issued in accordance with War Production Board's Limitation Order L-199.

U. S. Gov., Veterans Administration. Specification VA-GC-40c; 1942. Pastry Stove.

U. S. Gov., Veterans Administration. Specification VA-MC-220h; 1942. Heavy Duty Gas Ranges.

U. S. Gov., Veterans Administration. Specification VA-MC-305a; 1942. Gas Fired, Reel Type, (Revolving Tray) Bake Ovens.

U. S. Gov., Veterans Administration. Specification VA-MC-306a; 1942. Gas Ranges; Household and Diet Kitchen Type.

References.—Installation rules, *see* 614.0; other heating and ventilating equipment, *see* 792; unfired pressure tanks, *see* 605.23; other tanks, *see* 956.2; gas house heating equipment, *see* 614.4; gas and gas appliances, *see* 997.2; acetylene equipment and lamps, *see* 997.5; gas garage heater, *see* 614.9.

614.3 OIL AND GASOLINE STOVES, RANGES, AND WATER HEATERS

Institute of Cooking and Heating Appliance Manufacturers. Flue-Connected Oil-Burning Space Heaters. Tentative Standards, 1940. Includes publication of oil heater ratings in manufacturers' and jobbers' catalogs, for B.T.U. per hour, net heat output at specified draft; fuel consumption at specified draft in gallons per hour, at sea level conditions.

National Board of Fire Underwriters. Installation of Oil Burners in Stoves and Ranges Originally Designed for Solid Fuels and for the Storage and Use of Oil Fuels in Connection Therewith, No. 39; 1932. Conversion burners for fuel having a flash point over 100° F., using a gravity tank with a capacity of less than 6 gal. Permits separate storage tanks of 275 gal. capacity each of two, without enclosure within buildings. Piping, valves, burners, stoves and ranges, ignition device, and installation.

National Board of Fire Underwriters. Small Heating and Cooking Appliances, No. 310; 1937. Regulations covering kerosene and fuel oil stoves, cook stoves, and portable heaters. Minimum flash point, location of tanks, drums, and cans; construction of tank, supports and venting of tanks, oil gaging, piping, wiring, and flue connections.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Gasoline Stoves. Standards for the installation of gasoline stoves for cooking and heating. Classifies stoves and gives location of stoves, location of outside tanks, fuel piping, and care and attendance.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Kerosene or Oil Stoves. Standards for installation, maintenance, and use of small heating and cooking appliances (kerosene or fuel oil). Covers equipment, definitions, grade of fuel, location of and sizes of tanks and construction, vents, gages, piping, wiring, installation of appliances, flue connections, and general precautions.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Range Oil Burner Ordinance. Suggested ordinance regulating installation and operation of stove or range oil burners and oil storage in connection therewith. Definitions, requirements for approved equipment, installation, grade of oil, fuel tanks, and location of various sizes of tanks.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Gasoline Stoves for Cooking and Heating, 1928. Wickless type stoves for use in accordance with rules of the National Board of Fire Underwriters. Includes gravity and pressure systems, antiflooding devices, portable heaters, design and construction, fuel tanks of lift-out and outside mounting, generators and burners, valves, piping and fittings, etc.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Kerosene Stoves for Cooking and Heating, 1927. Nonportable type not requiring other fuel for generation. Gives general design requirements for frame and legs, sheet metal supporting parts, fuel supply by gravity or pressure, size of tank, lift-out tank and fount, pressure tanks, generator, burner, valves, piping, antiflooding device, and marking.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Oil Burners for Installation in Stoves and Ranges, 1932. Covers equipment for conversion of solid fuel stoves and ranges, except warm-air furnaces, steam and hot water boilers. To burn topped or distilled oil having a flash point of not less than 100° F., operating characteristics, workmanship, assembly, regulation, burner, ignition, safety control, antiflooding devices, tanks, electric equipment and wiring, and marking.

Underwriters' Laboratories, Inc. Standard for Oil-Burning Stoves, 1936. For stationary installation with flue connection and for heating and cooking. Requirements as to suitable construction and performance, framework, constant level valve, antiflooding device, draft regulators electrical equipment, vaporizing units, baffles, ignition, piping, radiating drum, sumps, gravity and vacuum tank sizes and construction, stuffing box details, controls, installation, and operation.

Underwriters' Laboratories, Inc. Standard for Portable Kerosene Heaters, 1924. Wick fuel burning mechanism, sheet metal drum radiator, center section, lower drum and legs, requirements for carrying handle, reservoir, stability, heat output, and leakage test.

U. S. Gov., Army Air Forces. Specification 40317-C (3); 1944. Heater; Utility, Type F-1, Gasoline, Portable.

U. S. Gov., Army Air Forces. Specification No. 40853; 1944. Heater; Lubricating Oil, Type K-1, Servicing.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 289. Range; Field, Liquid Gas.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 331. Stove; Camp, Kimmel.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R8-42; 1942. Range Boilers and Expansion Tanks. This establishes a schedule of sizes and capacities of black iron and galvanized range boilers and expansion tanks, diameters and lengths, gallon capacity, construction, working pressure, and tappings. This publication issued in accordance with War Production Board's Limitation Order L-199.

U. S. Gov., Navy Dept. Specification 65R3; 1939. Ranges; Navy-Standard, Oil-Burning, Light-Weight (for Cruisers, Destroyers, and Other High-Speed Craft).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-427; 1944. Heater; Photographic, Water, Type G-1.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 28-2A; 1929. Stove; Cooking, Kerosene, Domestic.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 28-3A; 1929. Heater; Water, Kerosene.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-84; 1939. Stove; Gasoline, 1-Burner.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-105; 1939. Stove; Gasoline, 2-Burner.

References.—Installation rules, *see* 614.0; unfired pressure tanks, *see* 605.23; other tanks, *see* 956.2; other heating and ventilating equipment, *see* 792; gasoline, fuel oil, kerosene, *see* 503.3, 503.4, 503.5; oil burners and heaters, *see* 614.9.

614.4 HOUSE HEATING BOILERS, RADIATORS, AND HOT-WATER TANKS

American Gas Assn. American Standards Assn., Z21.13-1943. Approval Requirements for Central Heating Gas Appliances. Includes—part I, construction requirements for use with all gases; part II, performance requirements, gas boilers for use with natural and manufactured gases; part III, performance requirements, gas boilers for use with liquefied petroleum gases; part IV, performance requirements, gas boilers for use with butane-air gas; part V, construction requirements, gas warm air furnaces for use with all gases; part VI, gas warm air furnaces for use with natural and manufactured gases; part VII, gas warm air furnaces for use with liquefied petroleum gases; part VIII, gas warm air furnaces for use with butane-air gas; part IX, construction requirements, gas floor furnaces for use with all gases; part X, gas floor furnaces for use with natural and manufactured gas; part XI, gas floor furnaces for use with liquefied petroleum gases; part XII, gas floor furnaces for use with butane-air gas; and appendix, definitions, arrangement of apparatus for testing, and types of lock seams considered acceptable.

American Gas Assn. American Standards Assn., Z21.34-1942. Approval Requirements for Gas-Fired Duct Furnaces. Represents basic standards for safe operation, substantial and durable construction, and acceptable performance for duct furnaces using gas fuel. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gases; and appendix, definitions and exhibit showing types of lock seams considered acceptable.

American Society of Heating and Ventilating Engineers. Code for Testing Radiators, 1927. Covers test room, air temperatures, steam supply, condensate, air venting, surface of radiator, duration of test, sources of error in radiator testing, results of tests, and example.

American Society of Heating and Ventilating Engineers. Code for Testing and Rating Concealed Gravity Type Radiation (Hot Water Code), 1933. Method for testing and rating convectors, for use in designing of the heating system. This code describes a boiler load method of rating, gives definitions, arrangements of apparatus for steam method and electrical method, test procedure, and formulas for computation of result.

American Society of Heating and Ventilating Engineers. Standard Code for Rating Steam Heating Solid Fuel Hand-Fired Boilers, 1930. To standardize the method to be employed and followed by any person, partnership, firm, corporation or association, who may desire to make use of or employ for any purpose whatsoever the statement: "The rating of the boilers herein listed are in accordance with the provisions of the A.S.H.V.E. Code (year) for Rating Steam Solid Fuel Hand-Fired Boilers." Includes rating designation, range of outputs for each boiler listed, list of conditions, statements of limiting conditions, manufacturers' guarantee, and definitions.

American Society of Mechanical Engineers. A.S.M.E. Boiler Construction Code. Low-Pressure Heating Boiler Code, 1940. These rules apply to steel and cast iron boilers used exclusively for low-pressure steam heating, hot water heating, and hot water supply. Recommendations cover ultimate strength of materials, minimum thickness of plates and tubes, joint efficiency, braced and stayed surfaces, boiler openings, supports, setting and installation, fittings and appliances, stamping, hydrostatic tests, and welding.

Anthracite Industries, Inc. Requirements for Approval of Space Heaters, No. 2075. Requirements for construction and operating characteristics.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, 1939. Net square radiation loads in 70° F., recommended for low pressure heating boilers. Gives assumptions, rules for computing net boiler loads, for various types of radiation, boiler sizes for hot water systems, recommendations for oil and stoker fired boilers, for round and square cast iron boilers, and for chimneys.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, 1939. Pipe sizes for steam and hot water heating systems. Requirements and tables covering one-pipe and two-pipe steam, two-pipe vapor, large one-pipe and two-pipe steam, large two-pipe vapor, vacuum pump system, hot water systems, and hot water circulating systems.

Heating, Piping, and Air Conditioning Contractors National Assn. Net Load Recommendations for Heating Boilers, 1943. Published semi-annually. The term net load as used in this book means the total amount of free standing radiation, or its equivalent, that is to be supplied with heat by the boiler. Gives valuable data of a general nature and gives tables showing the latest data from the leading manufacturers of boilers.

Heating, Piping, and Air Conditioning Contractors National Assn. Net Square Feed Radiation Loads in 70° F. Recommended for Low Pressure Heating Boilers, Part II; 1943. Covers net load recommendations for boilers and radiators, hot water heating systems, inside temperatures lower than 70° F., hot blast coils, unit heaters, water for domestic use, chimneys, boilers designed for coal but fired by oil or gas, oil burner capacities, stoker fired boilers, S.M.A. uniform stoker rating, tables showing maximum capacities for oil burners, and tables showing recommendations for round boilers and square boilers.

Institute of Boiler and Radiator Manufacturers. Testing and Rating Code (for Low Pressure Heating Boilers), 1940. Includes methods of rating hand-fired boilers burning bituminous and anthracite coal, automatically-fired oil, and fuel gas; and stoker-fired anthracite and bituminous coal. Gives piping and pick-up table for various sizes of boilers, time limit table, stack height and area charts, methods of testing boilers, instruments required, test data, typical set-up, and definitions.

Non-Ferrous Hot Water Tank Manufacturers Assn. Non-Ferrous Range Boilers and Hot Water Storage Tanks Used for Heating Water or Storing Water Under Street Pressure, 1940. Definitions and general requirements for capacity ratings, pressure, dating, tolerance, workmanship, solder; and pressure, vacuum, rupture, and pulsating tests.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R25-24; 1924. Hot Water Storage Tanks. This recommendation establishes simplified dimensions and capacities of hot water storage tanks. Detail requirements are given for working pressures, factors of safety, placing of tappings, and dimensions of manholes, handholes, and heating coils.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R157-37; 1937. Steel Horizontal Firebox Heating Boilers. This recommendation sets forth ratings of hand and mechanically fired boilers and for pipe-connection openings. Sponsored by the Steel Heating Boiler Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R174-43; 1943. Cast Iron Radiators. This recommendation establishes standard sizes of cast iron radiators giving number of tubes per section, catalog rating per section (sq. ft.), height, width, spacing, and leg height. It includes general provisions covering hydrostatic test pressure, nipples, tappings, pipe fittings, painting, and identification in trade literature. Sponsored by the Institute of Boiler and Radiator Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R181-41; 1941. Nonferrous Range Boilers. This recommendation covers stock sizes of ranges and is for the purpose of simplifying varieties thus achieving economies inherent in the production, distribution, and use of a simplified line. Sponsored by the Non-Ferrous Hot Water Tank Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS99-42; 1942. Gas Floor Furnaces—Gravity Circulating Type. The purpose of this standard is—(1) to establish minimum specifications for the guidance of manufacturers, distributors, and users of gravity circulating type, natural draft gas floor furnaces; (2) to avoid delays and misunderstandings; and (3) to provide a uniform basis for guaranteeing compliance through the use of labels or certification.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS101-43. Flue-Connected Oil-Burning Space Heaters Equipped With Vaporizing Pot-Type Burners. Provided as a basis for certification of the quality and performance of oil-fired heaters of the types covered, and for the guidance of manufacturers, distributors, installers, contractors, and purchasers. Covers general requirements, heater design and construction, performance, laboratory test code, standard oil-heater rating test, publication of heater ratings, information labeling, and guarantees. Sponsored by the Institute of Cooking and Heating Appliance Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard (Emergency) CS (E) 104-43; 1943. Warm-Air Furnaces Equipped With Vaporizing Pot-Type Oil Burners. This standard is provided as a basis for certification of the quality and performance of warm-air furnaces equipped with vaporizing pot-type oil burners as covered herein, and applies to furnaces arranged with either gravity or forced-air circulation. It does not include floor furnaces. Definitions, general requirements, furnace design and construction, performance, test codes, publication of furnace ratings, informative labeling, and guarantees.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 109-44; 1944. Solid-Fuel-Burning Forced-Air Furnaces. Provides a basis for guaranteeing the construction and performance of solid-fuel-burning forced-air furnaces and covers surface-fired and magazine-fed, solid-fuel-burning warm air furnaces with forced-air circulation in sizes up to 80,000 B.t.u. output. Gives definitions, general requirements, construction requirements, performance requirements under test, test code, data and report sheet, informative labeling, and appendix showing method of interpolating test results, graphic method of determining flue gas loss, and suggested form of log data sheets.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 115-44; 1944. Porcelain-Enameled Tanks. For porcelain-enameled tanks for domestic water service in sizes 15 to 80 gal., inclusive. Covers base metal, thickness of base material, enameling, operating conditions, standard types, sizes, test pressures, storage-capacity rating, working-pressure rating, rated hydrostatic test pressure, pulsation pressure, enamel coverage, enamel thickness, solubility of enamel, fittings; production, inspection, and sampling; methods of test; and marking and labeling.

U. S. Gov., Veterans Administration. Specification VA-MC-330a; 1944. Steam Heated Water Stills and Storage Tank.

References.—Installation rules, *see* 614.0; boiler plates, *see* 604.11; gray cast iron, *see* 611.11; fire brick, *see* 534.12; other heating and ventilating equipment, *see* 792; unfired pressure vessels, *see* 605.23; gas and gas appliances, *see* 997.2.

614.9 MISCELLANEOUS HEATING AND COOKING EQUIPMENT

American Gas Assn. American Standards Assn., Z21.28-1941. Approval Requirements for Portable Gas Baking and Roasting Ovens. Part I, for use with all gases—construction requirements; part II, for use with natural and manufactured gases—performance requirements; part III, for use with liquefied petroleum gases—performance requirements; part IV, for use with butane-air gas—performance requirements.

American Oil Chemists' Society. Methods of Analysis, Standard Ovens. Gives requirements for fuming oven, forced draft circulatory oven, F.A.C. standard vacuum oven, and oven jacketed with glycerine and water.

American Society of Heating and Ventilating Engineers. Standard Code for Testing Steam Heating Boilers Burning Oil Fuel, 1932. Provides a standard method for conducting and reporting tests to determine heat efficiency and performance characteristics. The code recognizes that tests of oil burners and boilers may be made under different conditions for different purposes, and with complete or limited facilities for conducting the tests. It is designed to cover the determination of a complete heat balance; if a less complete test is required to satisfy the objectives of the test, observations not required may be omitted. Includes definitions, set up of boiler and oil burner to be tested, instruments and measuring apparatus, fuel sampling, duration of test, starting and stopping continuous and intermittent tests, method of conducting test, performance charts, tables for data and results of tests, and calculations for tables.

American Society of Heating and Ventilating Engineers. Standard Code for Testing Stoker-Fired Steam-Heating Boilers. Adopted by the Stoker Manufacturers' Assn. Provides a standard method for conducting and reporting tests to determine heat efficiency and performance characteristics; this code does not fix the conditions that must be fulfilled for the acceptance or approval of the combination of boiler and stoker. The code recognizes that tests of stokers and boilers may be made under different conditions for different purposes, and with complete or limited facilities for conducting the tests. Includes definitions, set-up of stoker and boiler to be tested, instruments and measuring devices, fuel sampling, duration of tests, starting and stopping of tests, method of conducting tests, performance charts, tables for data and results of tests, and calculations for tables.

Anthracite Industries, Inc. Gravity Ash-Removal Methods. Descriptions and Dimensions, Bulletin MA-1; and Estimates and Construction Details, Bulletin M-2; 1938. Covers dimensional drawings for two types of ash-storage pits, ash-can receivers, and chute to ash-bin in basement, and estimates of average materials and labor required for construction.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume 2; 1940. Piping, Fittings, and Heating Systems. Includes specifications for tank heating equipments (with method of determining necessary heater capacities) covering requirements for multiple heaters, heating with hot water, steam coils inside tank, methods in southern localities, standpipes, operation, and choice of circulating heaters.

National Board of Fire Underwriters. Acetylene Equipment for Lighting, Heating, and Cooking, No. 50; 1930. Covers six classes of equipment such as stationary, portable, dissolved acetylene, etc., for use in or about dwellings; requirements on location of generator, details for outside generator house, capacity of piping, gas cylinders, flood lights, installation, operation, and storage of calcium carbide.

National Board of Fire Underwriters. Ovens for Japan, Enamel, and Other Flammable Finishes, No. 86; 1931. Regulations cover box and conveyor ovens, location, arrangement, and construction of ovens; ventilation, heating, power and lighting equipment, fire protection, operation, and maintenance.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Acetylene for Lighting, Heating, and Cooking. Covers general precautions, stationary apparatus for outside and for inside installation, semiportable apparatus, dissolved acetylene under pressure, portable apparatus for lighting, and storage of calcium carbide.

Stoker Manufacturers Assn. Minimum Setting Heights, 1940. Recommended headroom from grate to water cooled surface for use under normal conditions as applied to steel heating boilers. Applies also to cast iron boilers with use of correction factor. For fuel burning rates up to 100 lbs. per hour, with coal as fuel, and for 100 to 1,200 lbs. per hour by use of formula.

Stoker Manufacturers Assn. Uniform Stoker Rating, 1937. Includes rating requirements for small domestic coal burning stokers, and for heating loads up to 50,000 sq.ft. of direct steam radiation. Gives definitions, stoker size selection charts, and table of fuel required of various heat contents for boilers of 3 to 358 boiler horse power.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Oil Heated Incubator (Class B), 1927. Covers construction of wood case, noncombustible lining near heater, type and mounting of heater, metal gage, galvanizing, joint structure requirements for lamps, and drip pan.

Underwriters' Laboratories, Inc. Standard for Domestic Oil Burners, 1934. Requirements for operation in hot-water, hot-air, and steam heating systems without constant attendance. 'Does not include burners for stoves or oil burning stoves. Covers simplification of assembly, rigidity from shock, shielding, safety devices, and ignition systems. Also standards of performance, marking, workmanship, design detail, antiflooding devices, gravity systems, electrical and control equipment, pumps, strainers, combustion chambers, gages, etc.

Underwriters' Laboratories, Inc. Standard for Gas Garage Heaters, 1917. Covers requirements as to design, construction, and installation of heat radiating drums, materials, dimensions and perforation of inlet screens, outside casing, rain caps, flue and air inlet pipes, safety devices, piping, supports, and marking.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-41-S. Spoon; Basting, or Stirring, 10- or 12-Inch.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-46-S. Lifter; Pot.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-47-S. Masher; Potato, Wire.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 47-48-S. Turner; Cake, Heavy Hotel, Steel.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-51-S. Egg Whip; Heavy Wire.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-53-S. Saw; Meat, Detachable Blade.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-56-S. Pan; Dish, Retinned.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-21-S. Pans; Bake and Drip.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-25-S. Pans; Fry, Folding Handle.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-25-S. Pan; Pudding, 3-Quart, Granite.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-26-S. Pan; Pudding, Retinned, 4-Quart.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-27-S. Pan; Pudding, Retinned, 3-Quart.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-28-S. Pan; Pudding, Retinned, 2-Quart.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-29-S. Pan; Pudding, Retinned, 1-Quart.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-52-S. Chain; Kettle, With Hooks.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS48-40; 1940. Domestic Burners for Pennsylvania Anthracite (Underfeed Type). This standard covers underfeed-type burners, using Pennsylvania anthracite as a fuel and having a normal capacity between 10 and 100 lb. of coal per hour. Sponsored by Anthracite Industries, Inc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS75-42; 1942. Automatic Mechanical Draft Oil Burners Designed for Domestic Installations. The purpose of this commercial standard is to establish minimum standard specifications and methods of test for automatic mechanical draft oil burners for the guidance of manufacturers, distributors, installing contractors, and users. This standard covers general requirements, manufacturing and production tests, laboratory requirements and test procedure, installation requirements and performance tests, and oil burner certificate placed with each burner installation. Sponsored by Oil Burner Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS113-44; 1944. Oil-Burning Floor Furnaces Equipped With Vaporizing Pot-Type Burners. For oil-fired, flue-connected floor furnaces equipped with vaporizing pot-type burners with or without mechanical draft or forced circulation, either manually or automatically controlled. Gives general requirements, design and construction, performance, laboratory test code, publication of furnace ratings, informative labeling, guarantees, general installation requirements, sizing, placement, and venting.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 14. Kettles; Steam Jacketed, Aluminum.

U. S. Gov., Federal Specification RR-C-561; 1939. Amendment 1; 1940. Cookers; Steam-Pressure. Covers the metal-to-metal seal type (four sizes) either cast or wrought aluminum alloy. Gives requirements for material, construction, equipment, body, cover, locking device, safety valve, petcock, thermometers, rack, pans, bails, and lifters; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 30H1d; 1944. Heaters; Water (Shipboard Use).

U. S. Gov., Navy Dept. Specification 41P19c; 1932. Pots; Fire, Gasoline.

U. S. Gov., Veterans Administration. Specification VA-G-140a; 1942. Bread Storage Cabinets.

U. S. Gov., Veterans Administration. Specification VA-G-147a; 1937. Insets; Steam Table, Corrosion-Resisting Steel.

U. S. Gov., Veterans Administration. Specification VA-G-229a; 1937. Steam Table Pots.

U. S. Gov., Veterams Administration. Specification VA-G-240a; 1937. Baskets; Steamer, Perforated, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-255; 1937. Boiler; Double, Aluminum, Capacity Inside Pot 11 Qts.

U. S. Gov., Veterans Administration. Specification VA-G-271; 1937. Boilers; Double, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-G-355; 1941. Boiler; Pudding, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-M-41; 1935. Portable Gas Bake Ovens.

U. S. Gov., Veterans Administration. Specification VA-GC-98f; 1942. Coffee Filtering Devices.

U. S. Gov., Veterans Administration. Specification VA-GC-102s; 1944. Jacketed Kettles.

U. S. Gov., Veterans Administration. Specification VA-GC-105L; 1942. Pressure Type Vegetable Steamers.

U. S. Gov., Veterans Administration. Specification VA-GC-112a; 1939. Egg Boilers and Timers.

U. S. Gov., Veterans Administration. Specification VA-GC-117n; 1942. Institutional Type Coffee and Tea Urns.

U. S. Gov., Veterans Administration. Specification VA-GC-122g; 1942. Institutional Type Coffee and Tea Units—Siphoning and Agitating Type With Bags and Rings for Tea.

U. S. Gov., Veterans Administration. Specification VA-GC-123f; 1942. Vertical Type Plate Warmers.

U. S. Gov., Veterans Administration. Specification VA-GC-126b; 1942. Portable Pan Racks.

U. S. Gov., Veterans Administration. Specification VA-GC-133c; 1942. Coffee Urn Stands and Cup Warmers.

U. S. Gov., Veterans Administration. Specification VA-GC-134d; 1942. Platewarmers; Bain Marie Pans and Sauce Pan Racks With Cook Tables.

U. S. Gov., Veterans Administration. Specification VA-GC-136e; 1942. Bread Racks.

U. S. Gov., Veterans Administration. Specification VA-GC-358; 1942. Horizontal Type Plate Warmer.

U. S. Gov., Veterans Administration. Specification VA-MC-45e; 1942. Gas Fired Deep Fat Fryers.

U. S. Gov., Veterans Administration. Specification VA-MC-79e; 1940. Sectional Gas Roasters.

U. S. Gov., Veterans Administration. Specification VA-MC-85c; 1942. Gas Toasters.

U. S. Gov., Veterans Administration. Specification VA-MC-202d; 1938. Gas Fired Bread Ovens.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-80A; 1940. Steamer; Vegetable.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-85; 1939. Stove, Alcohol; and Tank.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-93A; 1940. Table; Steam.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-17; 1934. Range; Army Field, No. 1.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-111; 1941. Unit; Fire for Range, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-113; 1941. Grate; Wood-Burning, for Range, Field, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-114; 1941. Case; Water-Heater, for Range, Field, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-115; 1941. Shield; Water-Heater Case, for Range, Field, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-116; 1941. Cabinet and Cradle; Cookpot for Range, Field, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-121; 1941. Grate; Outfit, Cooking, Cavalry, Pack and Mountain Artillery.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-122; 1942. Boiler; Outfit, Cooking, Mountain Artillery, With Cover.

References.—Installation rules, *see* 614.0; other heating and ventilating equipment, *see* 792; other acetylene equipment, *see* 997.5; gas and gas appliances, *see* 997.2; electric heating and cooking equipment, *see* 717.1; starch cookers for laundry, *see* 787; heating equipment for power boilers, *see* 703.9; oil burner ignition transformers, *see* 713.5.

615. HAND TOOLS, METAL-WORKING

615.1 CHISELS, DRILLS, PUNCHES, REAMERS, TAPS, AND DIES

615.11 Chisels

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Navy Dept. Specification 41C23c; 1939. Chisels; Chisel-Blanks; Tools, Calking; for Metal.

References.—Heat treatment of chisels, *see* 600.5; chisels for pneumatic tools, *see* 615.9; wood working chisels, *see* 616.13; railway track chisels, *see* 616.8.

615.12 Drills, Bits, and Countersinks

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Drills; Twist. Covers definition, classification by material, classification by shape of shank, classification by standard diameter systems, classification of material to be drilled, special types of drills, and specifications.

Society of Automotive Engineers. 1944 Handbook, Section 8—Tools and Production Equipment. S.A.E. Standard Twist Drills—Sizes 1/64 to 1/2 Inch, Inclusive. Revised, 1938. Manufactured list and size designations, and classification of drills with diagrams and tables.

U. S. Gov., Federal Specification GGG-D-651; 1933. Amendment 1; 1944. Drills; Breast. Covers two types—(A) plain, and (B) ratchet. Gives requirements for material, workmanship, design, frame, breast plate, spindle, crank, gears, handles, chuck, finish, overall length, and ratchet mechanism; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 40C3; 1943. Countersinks; Steel (Carbon and High-Speed).

U. S. Gov., Navy Dept. Specification 41D6d; 1944. Drills; Ratchet.

U. S. Gov., Navy Dept. Specification 41D11a; 1935. Drills; Twist.

U. S. Gov., Treasury Dept., Procurement Div., 496a; 1942. Countersinks; Rose. Shall be of good quality high carbon steel. Gives requirements for dimensions, length overall, diameter of round, flutes, shank, finish, and trade mark; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.592; 1942. Drills, Drill Bits, and Drill Bit Holders; Stone, Hand. Covers the following types and classes: Type I—drills, one-piece; class A, four point; class B, three point; and type II—drill bits; class A, four point; class B, three point, straight flute; class C, three point, twist drill; and class D, two point, twist drill. Gives requirements for manufacture, bow, longitudinal relief, finish, construction, hardness, and sizes and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 29-81; 1938. Drill; Twist, High-Speed.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-2-7; 1921. Drill; Cordeau, Handled.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-114A; 1940. Drill; Twist, Carbon Steel.

U. S. Gov., Veterans Administration. Specification VA-M-262a; 1941. Countersinks.

U. S. Gov., Veterans Administration. Specification VA-MC-248a; 1941. Drill Points.

References.—Tool steel, alloy tool steel, *see* 603.32, 621.35; heat treatment of tool steels, *see* 600.5; electric drills, *see* 711.24.

615.13 Punches

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Federal Specifications GGG-D-641; 1945. Drifts; Drill. Shall be of one type, good quality carbon steel, Gives detail requirements as to design, size, finish, marking; methods of sampling, inspection, and tests; and shipping containers and packing.

U. S. Gov., Federal Specification GGG-P-831; 1933. Amendment 3; 1945. Punches; Bag, Center, Coopers', Coppering, Cutting, Tinners', and Drive-Pin. Covers eight types. Gives requirements for materials, workmanship, marking, hardening and tempering, tolerances, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-S-246; 1934. Sets-and-Headers; Rivet, Hand. Covers 3 types—(I) blacksmiths'; (II) coppersmiths', tinsmiths', and saddlers'; and (III) blacksmiths', handled. Gives requirements for marking, construction, hardening, finish, tolerances, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

615.14 Reamers

U. S. Gov., Navy Dept. Specification 41R7c; 1941. Reamers, Carbon-Steel, and High-Speed-Steel; and Arbors, Shell-Reamer.

U. S. Gov., Treasury Dept. Procurement Div., No.294; 1938. Reamers, Carbon-Steel, and High-Speed-Steel; and Arbors, Shell-Reamer. Covers 22 types of reamers and arbors. Gives requirements for material, workmanship, cutting edges, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Electric reamers, *see* 711.24.

615.15 Taps and Dies

Metal Cutting Tool Institute, Tap and Die Div. Commercial Standards for Taps and Dies, 1939. Gives standard symbols for marking, general dimensions and tolerances for hand taps, machine screw taps, nut, pipe, pulley, staybolt, and stove bolt taps, and various tapper taps. Also thread limits and tolerances, basic thread dimensions and tap drill sizes, for American, National Acme, British, French, and Whitworth standards, and standard chamfer for dies.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Taps. Covers definition, types and kinds, and specification of taps.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Threading Dies. Covers definition, types of threading dies, accuracy, standard thread forms, marking, and ordering information.

Society of Automotive Engineers. Joint sponsor with American Society of Mechanical Engineers and the National Machine Tool Builders' Assn. Taps, Cut and Ground Threads. American Standards Assn., B5.4-1939. General dimensions and working tolerances for various types of taps, definitions of the various types, tables of sizes and pitches including the American standard coarse and fine thread series. The S.A.E. standards for straight pipe taps and spark plug taps included are not listed as American standard.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R51-29; 1929. Die Head Chasers (for Self-Opening and Adjustable Die Heads). This recommendation establishes a list of standard stock sizes and threads per inch for national coarse thread and fine thread series, for S.A.E. spark plug and bushing thread, for lighting fixture and fitting thread, for railway sizes, and for pipe thread.

U. S. Gov., Federal Specification GGG-T-581; 1934. Amendment 1; 1935. Tools; Pipe-Threading, Hand. Covers ten types of pipe taps, pipe dies, and diestocks. Gives requirements for thread form, tolerance on lead of threads, imperfections, diestock handles, marking, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 41T15g; 1936. Taps; Dies; Diestocks; and Wrenches; Tap.

U. S. Gov., Navy Dept. Specification 41 T 19b; 1943. Taps; Ground, Hand.

U. S. Gov., Treasury Dept., Procurement Div., No.308; 1938. Taps, Dies, Tap Wrenches, and Diestocks.

Covers two types and all taps and dies shall have the American National form of thread, made from best quality tool steel. Gives requirements for cutting edges, squares on shanks, taps, dies, tolerances, and details of each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 41-MC-6; 1942. Taps; Dies; Diestocks; and Accessories; Hand. Covers nine types, two classes, and shall be but one grade. Gives requirements for materials, workmanship, threads, marking, heat treatment, squares, clearance, lead error tolerance, form and fit, sampling, inspection, tests, and drawings.

U. S. Gov., U. S. Maritime Commission. Specification 41-MC-7; 1942. Tools; Pipe Threading and Cutting, Hand. Covers twelve types, together with sizes, classes, and shall be but one grade. Gives requirements for materials, workmanship, threads, heat treatment, handles, carrying cases, marking, sampling, inspection, tests, and drawings.

References.—Tool steel, alloy tool steel, *see* 603.32, 621.35; heat treatment of taps, *see* 600.5; machine tool elements, *see* 765.

615.16 Nail Sets

U. S. Gov., Federal Specification GGG-N-71; 1932. Nail-Sets. Covers one type. Gives requirements for marking, shape, hardening, sizes, tolerances, and sets; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

615.2 HAMMERS AND SLEDGES

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

615.20 General Items

615.21 Hammers

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R159-42; 1942. Forged Hammers. This recommendation establishes a simplified schedule of grade, style, and weight of different kinds of hammers. Conforms with the requirements of Schedule II of Limitation Order L-157, Hand Tools Simplification (War Production Board).

U. S. Gov., Federal Specification GGG-H-86; 1942. Amendment 2; 1943. Hammers, Mauls, and Sledges. Covers 24 types of hammers, 3 types of mauls, and 2 types of sledges. Gives requirements for materials, workmanship, weight, forged heads, shape of head, striking faces, peens, eyes, handles, wedges, steel heads, hardness, finishes, corrosion protective coating, marking, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Post Office Dept. Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Hammers; Fender.

References.—Standard sizes, *see* 615.20; carbon tool steel, *see* 603.22, 603.32; alloy tool steel, *see* 621.35; forged steel, *see* 611.51, 622.6; wooden handles, *see* 428.20, 428.29; heat treatment, *see* 600.5.

615.22 Sledge Hammers

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-169. Hammers; Sledge, 4- and 8-Pound.

U. S. Gov., Federal Specification GGG-H-86; 1942. Amendment 2; 1943. Hammers, Mauls, and Sledges. Covers 24 types of hammers, 3 types of mauls, and 2 types of sledges. Gives requirements for materials, workmanship, weight, forged heads, shape of head, striking faces, peens, eyes, handles, wedges, steel heads, hardness, finishes, corrosion protective coating, marking, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Railway spike maul, *see* 616.8; *see* references under 615.21.

615.3 PINCHERS, PLIERS, PLIER CUTTERS, AND SHEARS

615.31 Pincers

U. S. Gov., Army Air Forces. Specification No. 50459; 1945. Tweezers; Instrument Repair.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-59; 1920. Pincers; Carpenters'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-104; 1921. Pincers; Shoeing, Blacksmiths'.

U. S. Gov., U. S. Army, Signal Corps. Specification 17-148; 1924. Grip; Straight Jaws, Wire Pulling for Size 0.

U. S. Gov., U. S. Army, Signal Corps. Specification 17-149A; 1935. Grip; Type LC-28, Eccentric Type for Bare Wire 1/2-Inch Diameter and Smaller.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-77A; 1927. Crimper; Type LC-8, for Cable Hangers.

615.32 Pliers and Plier Cutters

U. S. Gov., Army Air Forces. Specification No. 50458; 1945. Pliers and Cutters; Instrument Repair.

U. S. Gov., Federal Specification GGG-P-471; 1942. Amendment 2; 1944. Pliers and Nippers. Covers 3 types of nippers and 17 types of pliers. Gives requirements for material, workmanship, design, handles, joints, jaw openings, scoring, finish, tests, marking, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1942. Cutter; Wire, Intrenching, M-1938.

U. S. Gov., Marine Corps Specification, 1943. Pliers; Long Flat Nose, Side-Cutting.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Pliers; Side-Cutting.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2589; 1939. Pliers, Laboratory; and Wire Nippers.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-40; 1920. Plier; Pincer, Saddlers'.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-477A; 1933. Pliers; Types TL-13, TL-103, TL-107, and TL-126, Communication Electricians'.

U. S. Gov., Veterans Administration. Specification VA-M-233c; 1941. Nippers and Pliers; Jewelers'.

615.33 Shears

U. S. Gov., Federal Specification GGG-S-286; 1937. Shears; Roaching. Covers one type. Gives requirements for marking, design, blades, length of cut, screw, handles, finish, weight, length, and shape; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-S-291; 1933. Shears; Tinners', Bench, and Hand (Snips). Covers six types—(A) hand, straight cut; (B) hand, circular cut; (C) hand, combination; (D) hand, straight cut, extra heavy; (E) bench, single lever; and (F) bench, compound lever. Gives requirements for marking, blades, length of cut, bearing, bolts and nuts, handles, tolerances, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Shears; Metal.

References.—Office scissors, *see* 612.13; carbon and alloy tool steels, *see* 603.22, 621.35; forged steel, *see* 611.51, 622.6; heat treatments, *see* 600.5.

615.39 Miscellaneous Cutting Tools

U. S. Gov., Federal Specification OO-G-661; 1934. Grinders; Bench, Hand-Power. Covers two types—heavy duty, and medium; composed primarily of a grinding wheel, gear case or frame, wheel and gear shafts, bearings, crank handle, adjustable tool rest, and screw clamp for securing the grinder to a bench. Gives detail requirements; methods of sampling, inspection, tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-C-441; 1939. Clippers; Bolt. Covers three types—(I) compact, (II) rigid-head, and (III) swivel-head. Gives requirements for design of jaws, handles, connecting bolts, straps and jaw bolts, interchangeability, marking, and component parts; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-C-771; 1933. Cutters; Pipe. Covers one type. Gives requirements for marking, design, frame, cutter wheels, rollers, movable jaw, feed rod, handle, and pins; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 41C6d; 1934. Cutters; Washer.

U. S. Gov., Navy Dept. Specification 41C25b; 1944. Cutters; Cable, Hand-Power, for Electric Cable (Shipboard Use).

U. S. Gov., U. S. Army, Corps of Engineers. Specification 17-199; 1941. Cutter; Wire, 3/8-Inch Capacity.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-166; 1936. Cutter; Wire, Light, M-1916.

U. S. Gov., U. S. Maritime Commission. Specification 41-MC-7; 1942. Tools; Pipe Threading and Cutting, Hand. Covers 12 types, together with sizes, classes, and shall be but one grade. Gives requirements for materials, workmanship, threads, heat treatment, handles, carrying cases, marking, sampling, inspection, tests, and drawings.

References.—Carbon and alloy tool steels, *see* 603.22, 621.35; malleable cast iron, *see* 611.21; heat treatments, *see* 600.5.

615.4 VISES, WRENCHES, AND VISE CLAMPS

615.41 Vises

U. S. Gov., Federal Specification GGG-V-436a; 1942. Amendment 1; 1944. Vises. Covers 13 types—(I) bench, (II) blacksmiths', (III) bodymakers', (IV) combination, (V) hand, (VI) jewelers', (VII) machinists', (VIII) pattern-makers', (IX) pin, (X) pipe, (XI) riggers, (XII) saw, and (XIII) woodworkers'. Gives requirements for material, workmanship, finish, marking of vises, interchangeability, and details of each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

615.42 Wrenches

American Institute of Bolt, Nut and Rivet Manufacturers. American Standards Assn., B18.2-1941. Bolt, Nut, and Rivet Standards. Includes table of open end wrench openings for bolts and nuts.

American Society of Mechanical Engineers, Society of Automotive Engineers, sponsors. American Standards Assn., B 18.2-1941. American Standard Wrench-Head Bolts and Nuts and Wrench Openings. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H 28, Screw-Thread Standards for Federal Services, listed below. This 1941 standard is a comprehensive revision of the 1933 report, with many of the dimensions changed, footnotes amplified, much new material added, and some 65 illustrations included. Dimensions are for—regular series; heavy series; cap screw heads; set screw heads; regular nuts, jam nuts, and slotted nuts; machine screw and stove bolt nuts; heavy nuts and jam nuts; heavy slotted nuts; light nuts and light jam nuts; light thick nuts; light slotted nuts; light thick slotted nuts; light castle nuts; and open end wrench openings for regular, heavy, and light series bolts and nuts. An appendix gives the formulas upon which dimension and tolerance are based, and the thread lengths.

U. S. Gov., Army Air Forces. Specification 50030-D (2); 1944. Wrench; Open-End, Double-Head (Electricians' Type).

U. S. Gov., Army-Navy Aeronautical Specification AN-W-19; 1944. Wrenches; Spark Plug Elbow, Square Drive.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); and table of open-end wrench openings for regular, heavy, and light series bolts and nuts and for hexagon socket wrenches and fluted socket wrenches.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Federal Specification GGG-W-631; 1943. Wrenches; Bolt and Nut, Adjustable. Covers five types—(I) open end 22-1/2° angle, (II) auto, (III) monkey, (IV) open end s-handle, and (V) screw (key-Model). Gives requirements for material, workmanship, design, test loads, marking, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-W-636; 1942. Wrenches; Bolt and Nut, Nonadjustable (Open-End and Box). Covers 11 types. Gives requirements for design, finish, marking, hardness; methods of inspection, sampling, and tests; and requirements for packaging, packing, shipping containers, and marking for shipment.

U. S. Gov., Federal Specification GGG-W-641; 1943. Wrenches; Bolt and Nut, Socket. Covers one type consisting of detachable sockets and drive tools. Gives requirements for drives, sets, material, workmanship, sockets, drive tangs of tools, test loads, boxes for sets, finish, and marking; details for sockets, adapters, extensions, ratchets, screw-driver bits, slide rods, sliding T handles, speeders, and universal joints; methods of sampling, inspection, and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-W-651a; 1938. Amendment 3; 1942. Wrenches; Pipe. Covers six types—(I) adjustable, normal duty; (II) adjustable, heavy duty; (III) chain; (IV) girth; (V) strap; and (VI) angle style, adjustable. Gives requirements for design, handle, frame, movable jaws, adjusting nut, springs, frame, operation, marking, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-GGG-W-651a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changes requirements for type II.

U. S. Gov., Navy Dept. Specification 41T15g; 1936. Wrenches, Tap; Dies; Diestocks; and Taps.

U. S. Gov., Navy Dept. Specification 41W8d; 1934. Wrenches.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-3486; 1940. Wrench; Socket, Special, Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-3488; 1940 Wrench; Special, for Compound Plug, Submarine Mine.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-68; 1920. Wrench; Screw, Monkey.

615.43 Vise Clamps

U. S. Gov., Federal Specification GGG-C-406; 1934. Amendment 3; 1944. Clamps, and Hand Screws. Covers four types—(I) clamp "C", light service, medium service, and heavy service; (II) clamp, parallel, machinists' and toolmakers'; (III) clamp, screw, quick-adjusting, fixed head, and sliding head; and (IV) screws, hand, adjustable. Gives requirements for suitability, finish, marking, proof test, design and component parts, body, jaws, screws, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

615.5 ANVILS, BELLOWS, HARDIES, AND FORGES

615.51 Anvils

U. S. Gov., Federal Specification GGG-A-576; 1943. Amendment 1; 1945. Anvils; Blacksmiths'. Covers three classes—(I) all steel, single piece; (II) cast iron body with steel face and horn, and (III) cast steel body with steel face and horn. Gives requirements for weights, material, workmanship, marking, faces, horn, hardness, holes, and shapes and sizes; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

615.52 Bellows

U. S. Gov., Federal Specification LLL-B-211; 1942. Bellows; Hand, Foundry. Covers two sizes in one type. Gives requirements for materials, workmanship, marking, construction, sizes, packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 41B6b; 1934. Bellows; Hand, Foundry.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2303A; 1941. Bellows; Foot Power.

615.53 Hardies

References.—Standard sizes, *see* 615.55.

615.54 Forges

U. S. Gov., Federal Specification S-F-571; 1934. Forges; Portable, Coal-Burning. Covers two types—(I) round hearth, riveting and agriculture; in two classes—(A) 18-in. (agriculture) and (B) 18-in. compressed air (riveting and ship building); and (II) rectangular or square hearth; in four classes—(A) blacksmith, knockdown, or folding case model, (B) light or medium repair work, (C) general work, and (D) blacksmith, cast-iron, or steel hearth. Gives requirements for blower construction, designs, hearth size, tolerance, fan size, hearth thickness, height, and weight tolerance; methods of sampling and inspection; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 41F9a; 1942. Forges; Oil-Burning (Shipboard Use).

615.55 Miscellaneous Blacksmith Tools

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Navy Dept. Specification 41T17a; 1945. Tongs; Blacksmiths'.

U. S. Gov., Federal Specification GGG-T-561; 1934. Tools; Blacksmiths' and Horseshoers'. Covers 12 types—(I) chisels, (II) creasers, (III) cutters, (IV) flatters, (V) fullers, (VI) hammers, (VII) hardies, (VIII) heading-tools, (IX) irons, horseshoers', clinching, (X) pritchels, (XI) punches, and (XII) swages. Gives requirement for material, durability, forgings, eyes, finish, handles, hardness, cutting edges, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Carbon and alloy tool steels, *see* 603.22, 621.35; forged carbon and alloy steel, *see* 611.51, 622.6; heat treatments, *see* 600.5.

615.6 FILES, RASPS, HACK SAWS, AND SCRIBERS

615.61 Files

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Files and Rasps. Covers definition, material, classification, characteristics, uses, and ordering instructions.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-128. Files.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R6-44; 1944. Files and Rasps (American Pattern, and Straight- and Curved-Tooth Milled Files). Covers warding files, other files up to and including 6 in. in length, other files over 6 in. in length, horse rasps and shoe rasps, and straight- and curved-tooth milled files. Gives tables showing dimensions and cuts (teeth per inch) for standard types and sizes of files and rasps. Describes various types of files, rasps, and milled-tooth files.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 206-44; 1944. Swiss Pattern Files. Establishes a recommended simplified list of 38 types for stock production. The sizes and cuts in each type have also been simplified. The width, thickness, or diameter dimensions are given for some of the types, and dimensional tolerances are established. Gives general information, tables showing dimensions and cuts for various types, and description of types.

U. S. Gov., Navy Dept. Specification 41F3e; 1944. Files and Rasps; Hand.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2764; 1939. File; Vulcanite.

U. S. Gov., Veterans Administration. Specification VA-M-231e; 1941. Files; General Purpose.

References.—Dental files, *see* 915.10.

615.62 Hack Saws

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R90-36; 1936. Hacksaw Blades. This recommendation establishes a list of standard sizes of tungsten alloy and special alloy hacksaw blades. Sponsored by Hack Saw Manufacturers Assn.

U. S. Gov., Federal Specification GGG-B-451; 1944. Blades; Hack Saw, Hand. Covers three classes—(A) general service alloy, all-hard; (B) general service alloy, flexible; and (C) high speed steel, all-hard. Gives requirements for material, workmanship, teeth, straightness, holes, annealing of blade ends, marking, sizes, and details for each class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-F-671; 1931. Amendment 2; 1944. Frames; Hack-Saw. Covers three types—(A) straight handle, adjustable; (B) pistol-grip handle, adjustable; and (C) heavy, deep throat, solid. Gives requirements for material and workmanship, marking of frames, handles, finish, threaded parts, saw grips, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 41B11c; 1944. Blades; Hacksaw.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-18a; 1943. Saw; Meat, Butchers'. There shall be but one type and grade. Gives requirements for material, workmanship, construction, sizes, finish of metal parts, and marking; sampling, inspection, and methods of test; packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-M-52a; 1927. Hack Saw; Power.

References.—Carbon and alloy tool steels, *see* 603.22, 603.32, 621.35; heat treatment, *see* 600.5; wood saws, *see* 616.17.

615.63 Rasps

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Files and Rasps. Covers definition, material, classification, characteristics, uses, and ordering instructions.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R6-44; 1944. Files and Rasps (American Pattern, and Straight- and Curved-Tooth Milled Files). Covers warding files, other files up to and including 6 in. in length, other files over 6 in. in length, horse rasps and shoe rasps, and straight- and curved-tooth milled files. Gives tables showing dimensions and cuts (teeth per inch) for standard types and sizes of files and rasps. Describes various types of files, rasps, and milled-tooth files.

U. S. Gov., Marine Corps Specification, 1926. Rasp; Horse.

U. S. Gov., Navy Dept. Specification 41F3e; 1944. Files and Rasps; Hand.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2647; 1939. File and Rasp; Straight, Incisor, 12-Inch, Veterinary.

615.64 Scribers

U. S. Gov., Federal Specification GGG-S-131a; 1938. Scribers; Machinists'. Covers one type. Gives requirements for material, workmanship, marking, design, points, finish, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Carbon tool steel, *see* 603.32; heat treatment, *see* 600.5.

615.7 TINNERS' AND COPPERSMITHS' TOOLS

615.71 Soldering Coppers

U. S. Gov., Federal Specification W-I-681a; 1943. Amendment 1; 1944. Irons; Soldering, Electric. Covers four types—(I) radio, (II) light, (III) medium, and (IV) heavy. Gives requirements for material, workmanship, general design, tip, tip surface treatment, heating unit, handle, cord and plug cap, terminal connections, finish, marking, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-C-571a; 1943. Coppers (Irons); Soldering. Covers two classes—(A) solid copper, and (B) composite copper and steel; and two types—(I) regular tinner's point (pyramid), and (II) flat point (wedge). Gives requirements for material, size, marking, handles, and details including design, handle rod, points, and dimensions and weights; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 41-I-1e; 1944. Irons; Soldering, Electric.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-276A; 1941. Soldering Equipment; Type TE-26.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-535B; 1931. Iron; Soldering, Types TL-117, TL-120, and TL-121.

U. S. Gov., Veterans Administration. Specification VA-M-266; 1936. Irons; Soldering, Electric.

References.—Copper rods, *see* 642.11.

615.72 Blow Torches and Soldering Pots

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Gasoline Blow Torches. Recommended practice for construction, maintenance, and use of blow torches and plumbers' furnaces. Covers requirements for materials, joints, liquid capacity, stability, handles, closures, fount assemblies, needle valves, and tests.

U. S. Gov., Federal Specification RR-P-586; 1938. Pots; Solder. Covers one type—cast-iron, 5-in. or 7-in. diameter. Gives requirements for material, workmanship, dimensions, weights, and capacities; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-L-51; 1932. Ladles; Plumbers' Gives requirements for material, workmanship, marking, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-P-596; 1942. Pots; Fire, Gasoline and Kerosene. Covers two types—(I) gasoline; class A, standard, for heating solder pots; and class B, combination, for heating solder pots and soldering coppers; and (II) kerosene, standard, for heating solder pots. Gives requirements for material, workmanship, finish, marking, and construction; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-T-576; 1944. Torches; Blow, Hand. Covers three types—(I) alcohol (in three classes), (II) gasoline (in two classes and three sizes), and (III) kerosene (in two classes and three sizes). Gives requirements for material, workmanship, marking, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 41P30b; 1944. Pots; Solder, Electrically-Heated, Portable.

U. S. Gov., Navy Dept. Specification 41T4h; 1944. Torches; Blow, Alcohol and Gasoline.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 17-110A; 1943. Torches; Blow, Gasoline.

U. S. Gov., U. S. Army, Signal Corps. Specification 17-168; 1937. Torch; Type TL-130, Gasoline-Burning Blow Torch.

615.73 Bench Plates and Stakes

615.74 Scrapers

U. S. Gov., Treasury Dept., Procurement Div., No. 498; 1941. Scrapers; Tinners', Roofing. Shall be one type of high grade steel furnished in 8, 9, 10, and 12 in. sizes. Gives requirements for design, manufacture, hardness, finish, and trade mark; methods of inspection, sampling, and tests; and packaging, packing, and marking.

615.8 MEASURING TOOLS

615.80 General Items

References.—Levels, plumbs, rules, squares, tapes, *see* 616.3; hydrometers, thermometers, and scientific measuring instruments, *see* 919.

615.81 Calipers and Dividers

U. S. Gov., Federal Specification GGG-D-351a; 1944. Dividers. Covers three types—(A) spring, (B) firm-joint, and (C) wing. Gives requirements for material, workmanship, marking, points, smoothness of operation, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 41C22a; 1936. Calipers.

U. S. Gov., Treasury Dept., Procurement Div., No. 454; 1941. Calipers. Covers six types—(I) firm-joint hermaphrodite calipers; (II) lock-joint calipers; (III) micrometer calipers; (IV) spring calipers; (V) thread calipers, and (VI) transfer calipers, lock-joint. Gives requirements for sizes, measuring ends, outside and inside calipers, finish, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 488a; 1942. Divider; Spacing. Shall be of the firm joint spacing type and shall be only six inch size. Dividers except pins shall be made of steel, treated to resist corrosion, and pins shall be of nonferrous material. Gives requirements for workmanship, stamped numbers, points, arms, and joints; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2578; 1939. Caliper; Laboratory, Registering.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-21; 1920. Caliper; Machinists'.

615.82 Gages, Dimension

American Petroleum Institute, Div. of Production. Standard No.3; 1941. Dimensional Standards for Cable Drilling Tools (Taper Joints, Jars, Rope Socket Necks, Etc.). Contains complete dimensional standards only and does not cover chemical or physical properties. Gives requirements for certification of reference master gages, workmanship and finish, marking, basic thread form, method of gaging boxes and pins, size of wrench squares, for drilling and fishing jars, for drilling bits, and for fishing tools, etc.

American Petroleum Institute, Div. of Production. Standard 5-A; 1944. Specification for Casing, Drill Pipe, and Tubing. This specification covers chemical and physical properties and processes of manufacture of casing, drill pipe, and tubing, with dimensions on diameters, thicknesses, lengths, threads, etc., and master gages. Covers material, manufacture, chemical properties and tests, physical properties and tests, dimensions, weights, and lengths, threads, couplings, marking, inspection and rejection, tables, gaging practice, gages, and appendices.

American Petroleum Institute, Div. of Production. Standard 5-L; 1944. Specification for Line Pipe. This specification covers chemical and physical properties and processes of manufacture of line pipe, with dimensions on diameters, thicknesses, lengths, threads, etc., and master gages. Covers material, manufacture, chemical properties and tests, physical properties and tests, dimensions, weights, and lengths, threads, couplings, marking, inspection and rejection, tables, gaging practice, gages, and appendices.

American Petroleum Institute, Div. of Production. Standard 7-B; 1944. Specification for Rotary Drilling Equipment. Gives final dimensional standards, including gages, for regular and full-hole rotary drilling tool joints, tentative standards for internal-flush rotary drilling tool joints, and standards on auxiliary equipment. Covers material, workmanship and finish, marking, rotary drilling tool joints, drill collars, grief stems, couplings, and subs, bits, gaging practice, swivel gooseneck connections and rotary hose, rotary table, brake blocks, slush pumps, recommended practice on measurement, inspection, and rejection, gages, and appendices.

American Petroleum Institute, Div. of Production. Standard 11-B; 1942. Sucker Rod Specifications. Covers dimensional standards, gages and gaging practice, on five sizes of sucker rods. Gives sufficient dimensional standards to insure interchangeability for five sizes of rods (nominal 5/8 in., 3/4 in., 7/8 in., 1 in., and 1 1/8 in.), these including the dimensions of the threaded pin, of the threaded box, of the coupling for use with "double pin" rods, and of the wrench squares.

American Society of Mechanical Engineers, sponsor. American Standards Assn., B4a-1925. Tolerances, Allowances, and Gages for Metal Fits. Definitions, classifications of fits, tables of diameter tolerances for various fits for shaft and hole members, tables of negative tolerances for force fits and the force required for pressing in shaft. Also defines and illustrates ring, plug, receiving, indicating, snap, and caliper gages, formulas, and classification of fits.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Bolster, Truck Side Bearing Gage. Detailed dimensional drawing with important dimensions emphasized.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1940. Center Plate Gages, Body and Truck, 40, 50, and 70 Tons Nominal Capacity. Covers detailed dimensional drawings and marking of gages.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Decimal Gage. For general shop use, not for laboratory and tool room work, solid notch gage, marked in decimals of 1-in. from .002 to .250; size of ellipse and drawing indicating markings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Gages for Checking the Limit of Wear and Condemning From Service the Operating Parts of "UC" Passenger Brake Control Valves. Instructions for the use of gages and dimensional drawings for thirty special gages.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Instructions for Use of Condemning Gages for Type "K" Triple Valves. Covers use of wear limit gages, including feed groove location device, and device for checking capacity of new graduating spring.

Society of Automotive Engineers and American Society of Mechanical Engineers, sponsors. American Standards Assn., B1.2-1941. Screw Thread Gages and Gaging. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, Screw-Thread Standards for Federal Services.

Tire and Rim Assn., Inc. 1942 Year Book. Gauge for Checking Valve Holes. Gives sketch of gage.

Tire and Rim Assn., Inc. 1942 Year Book. Gauge for 3-Inch CC Clincher Motorcycle Rims. Gives sketch of "correct contour" gage.

Tire and Rim Assn., Inc. 1942 Year Book. Gauges for Drop Center Passenger Car Rims for Balloon Tires. Gives outline sketches of "correct contour" and "tolerance" gages.

Tire and Rim Assn., Inc. 1942 Year Book. Gauges for Flat Base Passenger Car Rims. Gives sketches of "correct contour" and "tolerance" gages; also statement of tolerances governing flat base straight side passenger car rims.

Tire and Rim Assn., Inc. 1942 Year Book. Gauges for Low Pressure Passenger Car Tire and Agricultural Tire Rims. Gives outline sketches of "correct contour" and "tolerance" gages.

Tire and Rim Assn., Inc. 1941 Year Book. Gauges for Straight Side Truck Rims. Gives sketches of "correct contour" and "tolerance" gages; also instructions for inspection of side rings of the endless and split types.

Tire and Rim Assn., Inc. 1942 Year Book. Gauge for 2.15B Motorcycle Rims. Gives outline sketch. Known as the "correct contour" gage.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 147. Gage; Surface, for Crosscut Saws, Madison Laboratory.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 148. Gage; Raker Length and Set, for Crosscut Saws.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); gages for American National form of thread; American National pipe threads; American National hose-coupling screw threads; and fire-hose coupling threads; miscellaneous standardized product threads; American National rolled threads; and Acme screw threads; and appendixes containing supplementary information of both a general and a technical nature including such specifications as are not intended to be mandatory.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS8-41; 1941. Gage Blanks. American Standards Assn., B47.1-1941. This standard covers standard designs for plain and thread plug gage blanks to 12.010 in. maximum gaging diameter; plain and thread ring gage blanks to 12.260 in. maximum gaging diameter; adjustable snap gages to 12 in.; adjustable length gages to any desired length; twin ring gages or combination ring and snap gages for work up to 1.135 in. diameter; dial indicators up to 3 3/4 in. nominal bezel diameter; and master disks up to 8.010 in. in diameter. Recommended general designs covering spline plug and ring gages, taper plug and ring gages, flush-pin gages, and flat plug gages are also included. Initiated by the industry, represented by the American Gage Design Committee.

U. S. Gov., Federal Specification GG-G-86; 1935. Gages; Sheet-Metal, Twist-Drill and Wire. Covers two types: (A) Circular; five classes—(1) U. S. standard for sheet and plate iron and steel, (2) steel wire, (3) American wire, (4) Birmingham wire, and (5) music wire; and (B) rectangular; two classes—(1) U. S. standard for sheet and plate iron and steel, and (2) twist drill and drill-rod. Gives requirements for material and workmanship, appearance and durability, hardness, marking, tolerances, and gaging sections; detail requirements for each type and class; methods of inspection; requirements for packaging, packing, and marking; and table of thicknesses or diameters corresponding to gage numbers.

U. S. Gov., Federal Specification GGG-G-61; 1932. Gages; Plug and Ring, Plain and Thread. Covers two types—(A) plain (cylindrical plug and ring), and (B) screw-thread (plug and ring). Gives requirements for marking, construction, gaging dimensions, and tolerances; methods of inspection; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 41G4c; 1942. Gages; Carpenters' and Machinists'.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2747; 1939. Gage; Millimeter, Boley.

References.—Gages for railway car wheels, *see* 611.53, 611.18; gages for railway car gears, *see* 611.55; gages for railway brake shoes, *see* 611.43; gages for car journal bearings. *see* 692.3; rules and measuring tapes, *see* 616.33, 616.35; gages for railway car truck bolsters, center plates, and truck sides, *see* 605.13; pressure and vacuum gages, *see* 793.2; carbon and alloy tool steels, *see* 603.22, 603.32, 621.35; heat treatment, *see* 600.5; gages for cable drilling tool joints, *see* 754.

615.9 MISCELLANEOUS METAL-WORKING TOOLS

American Hospital Assn., 40-4. Mechanical Can Opener. Covers two sizes in table type openers.

American Public Works Assn. Sewers, J1-38; 1938. Includes vibration tools for use in depositing concrete in form work, requirements as to frequencies of vibration, weight and diameter related to volume of concrete being placed, handles to be insulated from operator and arranged for control by operator.

Compressed Air Institute. Trade Standards, 1938. This standard includes pneumatic tools and accessories, rock drills, portable compressors, receivers, aftercoolers, filters, piping, and valves. Portable pneumatic grinders, pneumatic drills, riveting hammers, hoists, sand rammers, and gives requirements as to operating speeds, sizes or types, capacities, safety precautions, hose sizes, operation, and maintenance.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-42. Air Hammer; Compressed, Portable With Compressor, Gasoline.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Federal Specification GGG-E-926; 1933. Extractors; Cotter-Pin. Covers one type. Gives requirements for handle, design, hardness, finish, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 40R2c; 1944. Rivet-Sets; Pneumatic-Tool.

U. S. Gov., Navy Dept. Specification 41E1d; 1927. Expanders; Tube.

U. S. Gov., Navy Dept. Specification 41E2; 1924. Expanders; Hose.

U. S. Gov., Navy Dept. Specification 41S3h; 1944. Scrapers; Ship, for Removing Paint and Scale.

U. S. Gov., Navy Dept. Specification 41S4b; 1925. Scrapers; Machinists'.

U. S. Gov., Navy Dept. Specification 41S34B; 1938. Stakes; Coppersmiths', Tinsmiths', and Sheet Metal Workers'.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 17-160; 1932. Block; Dolly.

References.—Electric tools, drills, reamers, buffers, and grinders, *see* 711.24.

616. HAND TOOLS OTHER THAN METAL-WORKING TOOLS

616.0 GENERAL ITEMS

U. S. Gov., U. S. Army, Signal Corps. Specification 17-164A; 1942. Tool Sets; Types TE-6 and TE-11, Mechanics'.

616.1 EDGE TOOLS

616.11 Adzes, Axes, and Hatchets

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-9-1. Ax; Double-Bit, Western Pattern.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-9-2. Ax; Double-Bit, Young's Pattern.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-9-3. Ax; Double-Bit, 2 1/2-Pound Cruiser.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-9-4. Ax; Single-Bit, 2 1/4-Pound Boys' Pattern.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-9-5. Ax; 1 1/4-Pound Belt.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-329. Stone; Ax, Hand.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R158-42; 1942. Forged Axes. This recommendation establishes a schedule of sizes, grades, and patterns covering single-bit, double-bit, and miscellaneous axes, and conforms with the requirements of Schedule II of Limitation Order L-157, Hand Tool Simplification (U. S. Gov., War Production Board).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R160-42; 1942. Forged Hatchets. This recommendation establishes a simplified schedule of grade and size of standard and special patterns of hatchets, broad axes, and adzes; to conform with the requirements of Schedule II of Limitation Order L-157, Hand Tools Simplification (U. S. Gov., War Production Board).

U. S. Gov., Federal Specification GGG-A-151a; 1940. Adzes. Covers three types—(I) carpenters' (full head, half head), (II) railroad (full head), and (III) ship carpenters' (spur head, lipped bit; spur head, plain bit). Gives requirements for hardness, finish, handles, marking, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-A-926a; 1943. Axes. Covers two types—(I) chopping, 4 lb., and (II) fire, with pick head, 6 lb. Gives requirements for material, workmanship, construction, eye, handles, pattern, hardness, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-H-131; 1932. Hatchets. Covers five types—(A) axe pattern or hunter's, (B) claw, (C) half, (D) lathing, and (E) shingling. Gives requirements for method of manufacture, bits, eye, head, handles, marking, labeling, finish, tolerances, and dimensions; methods of sampling, inspection, and tests; and requirements for packing, packaging, and marking. Emergency Alternate Federal Specification E-GGG-H-131; 1943, changed requirements for handles.

U. S. Gov., Federal Specification GGG-H-601; 1944. Hooks; Bush (Brush). Covers two types—(I) ax eye; class A, double edge, 12 in. blade; and class B, single edge, 10, 11, or 12 in. blade; and (II) strap eye, 10, 11 1/2, or 12 1/2 in. blade. Gives requirements for material, workmanship, hardness, toughness, handles, finish of blades, marking, and details for each type, class, and size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-44A; 1922. Broadax; Handled.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-167; 1936. Ax; Intrenching, With Handle, M-1910.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-196; 1940. Machete M-1939.

References.—Carbon tool steel, *see* 603.32; forged steel, *see* 611.51; wooden tool handles, *see* 428.20, 428.29.

616.12 Augers and Carpenters' Braces

U. S. Gov., Federal Specification GGG-B-383; 1941. Amendment 2; 1943. Bits, Wood-Boring; and Chisels, Mortising, Hollow. Covers type I, fifteen classes of bits—(A) auger; (B) bellhangers'; (C) car; (D) expansive, plain; (E) expansive, screw or gear adjusting; (F) forstner, hand; (G) forstner, machine; (H) gimlet, double cut; (I) machine, with machine shank, with flat; (J) machine, with machine shank, without flat; (K) plug, hand; (L) plug, machine; (M) ship auger, with machine shank, with flat; (N) ship auger, with straight square shank; and (O) ship auger, with ring; type II, chisels, mortising hollow; and type III, two classes of auger bit sets—(A) in canvas rolls, and (B) in wood boxes. Gives requirements for longitudinal relief, bow, cutting edges, size accuracy, polish finish, marking, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-B-671a; 1940. Amendment 1; 1944. Braces; Ratchet. Covers one type. Gives requirements for design, chuck and jaws, spindle, ratchet mechanism, sweep, head, center grip, marking, finish, sizes, shapes, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-191; 1939. Gimlet.

616.13 Chisels

U. S. Gov., Federal Specification GGG-C-311; 1932. Chisels, Gouges, and Slicks; Woodworkers'. Covers six types—(A) chisels, socket firmer; (B) chisels, socket framing; (C) chisels, tanged turning; (D) gouges, socket firmer, outside or inside bevel; (E) gouges, tanged turning; and (F) slicks. Gives requirements for marking, blades, handles, finish, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.464; 1941. Openers; Box (Box-Chisels). Shall be of the bent tapered-claw pattern, consisting of a straight body and a chisel-edge tapering claw bent at an angle of approximately 15 degrees with the body. Gives requirements as to dimensions, claw hardness, strength, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-87A; 1943. Chisel; Hand, Cold.

References.—Heat treatment of chisels, *see* 600.5; chisels for pneumatic tools, *see* 615.9; track chisels, *see* 615.11.

616.14 Drills, Bits, and Countersinks

U. S. Gov., Federal Specification GGG-B-383; 1941. Amendment 2; 1943. Bits, Wood-Boring; and Chisels, Mortising, Hollow. Covers type I, fifteen classes of bits—(A) auger; (B) bell-hangers'; (C) car; (D) expansive, plain; (E) expansive, screw or gear adjusting; (F) forstner, hand; (G) forstner, machine: (H) gimlet, double cut; (I) machine, with machine shank, with flat; (J) machine, with machine shank, without flat; (K) plug, hand; (L) plug, machine; (M) ship auger, with machine shank, with flat; (N) ship auger, with straight square shank; and (O) ship auger, with ring; type II, chisels, mortising hollow; and type III, two classes of auger bit sets—(A) in canvas rolls, and (B) in wood boxes. Gives requirements for longitudinal relief, bow, cutting edges, size accuracy, polish finish, marking, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-D-671; 1934. Amendment 1; 1944. Drills; Hand. Covers two types—(A) plain, hollow handle, 0 to 3/8 in. capacity; and (B) ratchet, solid handle, 0 to 1/4 in. capacity. Gives requirements for component parts, frame, spindle, chuck, gears, handles, lubrication, marking, finish, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 232A; 1939. Drills; Pneumatic, Rock, Hand-Held. Covers one type, in two sizes—approximately 45 lb. and 58 lb. Gives requirements as to construction, valves, chuck, rotation, blowing means, handle, lubrication, weight, and bore and stroke; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.238. Drills; Rock. Shall be of two types—(I) detachable-bit, and (II) one-piece. Gives detail requirements as to chemical composition, hardness, finish, design, sizes and shape, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 496a; 1942. Countersinks; Rose. Shall be of good quality high carbon steel. Gives requirements for dimensions, length overall, diameter of round, flutes, shank, finish, and trade mark; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 507a; 1942. Drills; Hand, Automatic. Covers one type and size of automatic hand push drill. Gives requirements for design and operation, components, spiral and drive nut, return spring, chuck, handle, magazine, drill points, overall length, and finish; methods of inspection, sampling, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 17-143B; 1940. Drill; Mining, 2 1/2-Inch, Sectional Handles.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-97; 1921. Drill; Star.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-144B; 1940. Drill; Stone, Hand, Single-Bit.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-159; 1932. Borer; Bung or Tap.

616.15 Knives

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.218. Knife; Brush.

U. S. Gov., Federal Specification GGG-K-471; 1932. Knives; Drawing. Covers two types—(A) fixed handle, and (B) folding handle. Gives requirements for sizes, shanks, handles, ferrules, and blades; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-K-481; 1934. Amendment 4; 1943. Knives; Linoleum, Plumbers' Chipping, Putty, Scraping, and Shoe. Covers five types—(I) linoleum, (II) shoe, (III) plumbers' chipping, (IV) putty, (V) scraping. Gives requirements for material, marking, imperfections, hardness, blade, handles, dimensions, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, 1944. Knife; Fighting and Utility, 7-Inch Blade, Complete With Sheath.

U. S. Gov., Marine Corps Specification, 1943. Knife; Hospital Corps.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-103; 1921. Knives; Shoeing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-569C; 1938. Knife; Type TL-29, Pocket, Electricians'.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-591B; 1941. Knife; Type LC-14-B, Brush Cutting.

U. S. Gov., Veterans Administration. Specification VA-G-119; 1934. Knives; Paring, Corrosion-Resisting Steel.

References.—Pocket knives, *see* 612.11; carbon-tool steel, *see* 603.32; heat treatment, *see* 600.5.

616.16 Planes and Scrapers

U. S. Gov., Federal Specification GGG-P-436; 1940. Amendment 1; 1944. Planes. Covers ten types—(I) block; (II) bullnose rabbet; (III) circular; (IV) combination; (V) core box; (VI) jack; (VII) jointer; (VIII) match, tongue, and groove; (IX) rabbet; and (X) smooth. Gives requirements for machined surfaces, clamping device, marking, cutter, throat, material, finish, shape, sizes, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-S-271; 1932. Shaves; Spoke. Covers one type. Gives requirements for component parts, frame, handles, cutters, marking, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, 1918. Scraper; Box.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-188; 1939. Plane; Wood Frame.

References.—Carbon-tool steel, *see* 603.32; heat treatment of steel, *see* 600.5.

616.17 Saws

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Saw; Portable Power.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 246. Outfit; Saw-Filing.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 310. Saws; Swedish Buck.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-309. Saws; Crosscut.

U. S. Gov., Federal Specification GGG-H-101a; 1938. Hand-Saw Sets. Gives requirements for design, anvil, plunger, adjustment, capacity, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-S-61a; 1942. Saws. Covers 21 types. Includes back, band (metal-cutting and wood-cutting), buck, butcher, circular, compass, cross-cut, hand cross-cut, hack, rip, hole, keyhole, miter-box, web (felloe), and nest of saws. Gives requirements for material, workmanship, handles, length of cutting edge, set, thickness, screws, nuts, rivets, and details for each type; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Saws; Band.

U. S. Gov., Treasury Dept., Procurement Div., 422B; 1942. Saws; Woodworking, Motor-Driven, Circular, Overhead Arm. Covers two types and various sizes. Gives requirements for material, construction, safety, gears, column and arm, carriage or ram, motors, motor protection, controllers, cord, grounding tools, instructions, finish, and details of each type; methods of inspection and tests; and packing and marking.

U. S. Gov., Veterans Administration. Specification VA-M-252b; 1941. Saw Blades; Jig or Scroll.

References.—Carbon-tool steel, *see* 603.32; heat treatment of steel, *see* 600.5; saw sets for saws, *see* 615.9; hack saws, *see* 615.62.

616.18 Glass Cutters

U. S. Gov., Federal Specification GGG-C-751a; 1944. Cutters; Glass, Wheel-Type (for Sheet-Glass and Round-Gage Glass). Covers two types—(I) sheet glass cutters; class A, single, fixed wheel; B, single, renewable wheel, and C, turret head; and (II) gage glass cutters; class A, bar grip handle; and B, plier handle. Gives requirements for material, workmanship, marking, cutting wheels, axles, test requirements, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 41C5e; 1944. Cutters; Gage-Glass.

616.2 AWLS, PUNCHES, AND SCREW DRIVERS

616.21 Awls

U. S. Gov., Federal Specification GGG-A-891; 1939. Awls. Covers five types—(I) belt, (II) bent-point, (III) brad, (IV) saddlers', and (V) scratch; and six classes for type IV—(A) collar, (B) harness, (C) pad-or-seat, (D) pegging, (E) sewing-and-stitching, automatic, and (F) sewing-and-stitching, common. Gives requirements for material, blades, tolerances, marking, handle, shape, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-M-264a; 1941. Awls; Scratch.

616.22 Punches

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-55; 1920. Punch; Revolving, Saddlers'.

U. S. Gov., Veterans Administration. Specification VA-G-351; 1940. Pans; Cake, Aluminum.

U. S. Gov., Veterans Administration. Specification VA-M-236b; 1941. Punch, Belt Revolving Spring; and Extra Tubes.

References.—Railway track punches, *see* 616.8; blacksmith punches, *see* 615.13.

616.23 Screw Drivers

U. S. Gov., Army-Navy Aeronautical Specification AN-S-30; 1943. Screw Drivers; Cross Pointed.

U. S. Gov., Federal Specification GGG-B-376; 1936. Bits; Screw-Driver. Covers one type. Gives requirements for method of manufacture, shank, hardness, finish, marking, sizes, shape, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-S-121a; 1936. Amendment 2; 1939. Screw-Drivers. Covers eight types—(I) cabinet; (II) close quarter; (III) common; (IV) jewelers'; (V) machinists', extra heavy duty; (VI) offset; (VII) pocket; and (VIII) ratchet. Gives requirements for handles, blades, ferrules, sizes, shape, tolerances, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-GGG-S-121A; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) deleted all reference to nickel plating and gave requirements for finish.

616.3 LEVELING AND MEASURING TOOLS

616.30 General Items

References.—Calipers, dividers, dimension gages for metal working, *see* 615.81, 615.82.

616.31 Bevels and Miter Boxes

U. S. Gov., Navy Dept. Specification 41B7d; 1943. Bevels.

U. S. Gov., Treasury Dept., Procurement Div., No. 291; 1938. Boxes; Miter. Shall be of the adjustable type, made of high-grade materials. Gives requirements for bed and back, swinging lever, saw guides and posts, length gage, and angle attachment; method of sampling, inspection, and tests; and packaging, packing, and marking.

616.32 Levels and Plumbs

U. S. Gov., Federal Specification GGG-L-211; 1936. Amendment 3; 1944. Levels and Plumbs. Covers four types—(I) carpenters', (II) machinists', (III) masons', and (IV) pocket. Gives requirements for frame, vial holders, vials, vial protectors, sizes, shapes, tolerances, and stock; methods of sampling, inspection, and tests; and packaging, packing, and marking. Emergency Alternate Federal Specification E-GGG-L-211; 1942, changed requirements for materials for the various parts.

U. S. Gov., Federal Specification GGG-P-501; 1937. Amendment 1; 1939. Plumb-Bobs. Covers four types—(I) brass (builders' and surveyors'), (II) cast iron, (III) mercury-filled steel, and (IV) solid steel. Gives requirements for marking, size, point, defects, design, finish, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-GGG-P-501; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) eliminated all reference to mercury-filled plumb-bobs, brass and nickel plating, and changed requirements for sizes of types I and II.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-31; 1921. Plumb Bob; Brass, 10-Ounce.

616.33 Rules

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Linear Measures. Gives detail requirements for measures of length made of metal, wood, and folding types; also allowable tolerances for measures of certain lengths from 6 ft. to 1/2 ft. or less for measures other than tapes of steel, and from 100 to 3 ft. for steel tapes.

U. S. Gov., Federal Specification GGG-R-791; 1933. Amendment 1; 1941. Rules. Covers five types—(A) caliper, (B) carpenters' folding, (C) multiple folding, (D) steel, and (E) tape. Gives requirements for markings, tolerances in widths, and graduations; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-GGG-R-791; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) deleted all reference to brass, brass plating, nickel plating, and chromium plating and changed requirements for materials for several parts.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-54; 1943. Rule; Steel, Beveled, English and Metric, 50-Inch, Inch and Centimeter Graduations.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2560; 1939. Rule; Ivory.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2714; 1939. Ruler; Wood, Metric.

616.34 Squares

U. S. Gov., Federal Specification GGG-S-656; 1941. Squares; Carpenters', Diemakers', and Machinists'. Covers nine types. Gives requirements for sizes, marking, design, graduations, construction, accuracy, interchangeability, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-GGG-S-656; 1943, substituted steel and suitable material for brass.

616.35 Tapes

American Transit Assn. Recommended Design for Wheel Circumference Measuring Tape for Contours A, B, C, and D, E115-32; 1932. Gives dimensional drawing of wheel circumference measuring tape for contours. Emergency Revision E115 (Em); 1942, changed requirements to meet demands of the present national emergency.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Dimensions of Ball Tapes for Measuring Agricultural Rims Having 5° tapered bead seats, 1944. Gives drawing and table showing nominal rim diameter, specified rim diameter, tape mandrel diameter and tape mandrel circumference for 5/16 in. diameter balls and 5/8 in. diameter balls.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Dimensions of Ball Tapes for Measuring Divided Type Rims or Wheels for Combat Tires. Gives diagram and tables showing dimensions.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Dimensions of Ball Tapes for Measuring Rims Shown in This Handbook Having 5° Tapered Bead Seats.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Dimensions of Ball Tapes for Measuring Rims Shown in This Handbook Having 5° Tapered Bead Seats. Gives drawing with table showing nominal rim diameter, specified rim diameter, tape mandrel diameter, and tape mandrel circumference for 5/16 in, and 5/8 in. diameter balls.

U. S. Gov., Federal Specification GGG-T-106; 1943. Tapes; Measuring, General-Use. Tapes shall be Type I—linen; type II—steel; and type III—woven, metallic; and of classes and sizes as listed. Covers material, workmanship, marking, graduations and figures, finish, ribbon, reel, handle, case, accuracy; methods of sampling, inspection, tests; packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 41T26; 1940. Tapes; Measuring, Cloth.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 17-173; 1938. Rule; Tape, 6-Foot.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-66B; 1927. Measure; Tape.

References.—Calibration of engineer and other steel tapes, *see* 916.21; tolerances on standard tapes, *see* 919.1.

616.4 HOOKS AND PULLERS

616.41 Hooks, for Manual Handling of Commodities

References.—Vehicle and harness hooks, *see* 603.57; slip hooks, grab hooks, hoist or sling hooks, bale hooks and box hooks, barrel hooks and stone hoist hooks, hogshead hooks, and can hooks, *see* 603.57.

616.42 Nail Pullers

U. S. Gov., Federal Specification GGG-P-791; 1932. Pullers; Nail. Covers one type. Gives requirements for jaws, shanks, rammer, finish, marking, weight, and length; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Pullers for railway track spikes, *see* 616.8.

616.5 TOOLS FOR LINE CONSTRUCTION MEN

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-2; 1924. Tools and Equipment Necessary for a General Construction or Repair Gang. Gives general list of requirements for a gang of about 16 men, including tools for a wire stringing gang. Includes hand tools, anvil, belts, auger bits, blocks, boxes, chain, rope, motor and hand car equipment, and materials.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-68; 1937. Linemen's Climbers, Pads, and Straps. Includes leg iron or shank, gaff or spur, climber pads, and climber straps. Gives dimensional requirements and quality of materials.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 17-129; 1921. Hook; Cant.

U. S. Gov., U. S. Army, Signal Corps. Specification 29-7A; 1940. Climber; Lineman's, Types LC5, LC6, and LC7.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-86A; 1941. Clamp; Type LC-24, Combination Wire and Sleeve.

References.—Linemen's safety belts, *see* 069.3, 311.8; rubber lineman's gloves, *see* 203.2; timber tongs, *see* 616.8.

616.6 SOIL WORKING TOOLS

616.60 General Items

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-385. Wedges; Steel, Falling and Sawing.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.386. Wedge; Hardwood Falling.

616.61 Bars, Digging and Tamping

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Treasury Dept., Procurement Div., 529a; 1942. Tampers; Asphalt, Concrete, Earth, Etc. Covers one type. Gives requirements for finish, wooden handles, steel pipe handles, head, size, and weight; methods of sampling and inspection; and packaging, packing, and marking.

References.—Standard sizes, *see* 616.60; tool steel, *see* 603.32; chisel bars, crow bars, pinch bars, *see* 616.91.

616.62 Hoes, Rakes, and Forks

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Rake; Fire, Lawncomb Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.283. Rake; Fire, Asphalt Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 284. Tool; Rake and Cutting (Council or Rich Type).

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-175. Hoe; Saw-Steel.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-179. Hoe; Hazel.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-353. Tool; McLead (Solid-Head Type).

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-355. Tool; Pulaski (Hoe and Ax).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Federal Specification GGG-F-601; 1933. Forks; Hay and Manure. Covers four types—(I) three-tine hay (bent handle and straight handle), (II) four-tine manure (long handle and D-handle), and (III) five-tine manure (long handle and D-handle), and (IV) six-tine manure (long handle and D-handle); and one grade. Gives requirements for marking, pattern, construction, shape of tines, shape of handles, appearance, finish, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-H-496; 1941. Hoes; Garden and Mortar. Covers three types—(I) garden, (II) mortar, and (III) mortar mixing. Gives requirements for material, design, construction, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-H-506a; 1942. Hoes; Mattocks, and Picks. Covers three classes of hoes, six classes of mattocks, and eleven classes of picks. Gives requirements for material, workmanship, design, sizes, hardness, eyes, handles, marking, finish, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-R-96; 1941. Rakes; Hand. Covers one grade and four types—(I) asphalt (tar), (II) garden, (III) lawn, and (IV) road. Gives requirements for material, workmanship, and measurements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 462B; 1943. Forks; Mill, Heavy. Shall be heavy type, with bent handle, D-handle grip, and tines that are oval shape in cross-section. Gives requirements for fork head, handles, ferrule, cap, fastening of handle, strength, finish, and trade mark; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Treasury Dept., Procurement Div., 492b; 1943. Forks; Spading. Covers two types of four tine forks—(I) heavy and (II) light. Gives requirements for fork head, handles, ferrule, cap, fastening of handle, rivets, strength, finish, and manufacturers' name or trade mark; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Standard sizes, *see* 616.60; wooden handles, *see* 428.1; tool steel, forged steel, *see* 603.22, 611.51.

616.63 Scoops, Shovels, and Spades

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-88; 1942. Long Handle Shovels. For use in the communication plant. Gives general requirements, material and workmanship, dimensions, identification, inspection and tests, packing, marking, and warranty. Emergency Alternate 1-A-88EA; 1943, changed 1-A-88, in order to conserve critical and scarce materials during the war period.

Assn. of American Railroads, Telegraph and Telephone Section 1-A-89; 1942. Digging Spoons. For use in the communication plant. Gives general requirements, material and workmanship, dimensions, identification, inspection and tests, packing, marking, and warranty. Emergency Alternate 1-A-89EA; 1943, changed 1-A-89, in order to conserve critical and scarce materials during the war period.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R48-42; 1942. Shovels, Spades, Scoops, and Telegraph Spoons. This recommendation establishes a list of standard types and sizes of shovels, spades, scoops, and telegraph spoons, with dimensions of blade, type of handle, type of back, and kind of finish designated; to conform with the requirements of Schedule I to Limitation Order L-157, Hand Tools Simplification (U. S. Gov., War Production Board).

U. S. Gov., Federal Specification GGG-S-326; 1940. Amendment 3; 1944. Shovels (Scoops, Spades, and Spoons). Covers twelve types. Gives requirements for material, workmanship, construction, blade, finish, handles, shapes, and details for each type; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-172; 1938. Shovel; Intrenching, M-1910.

References.—Wooden handles, *see* 428.1.

616.64 Picks and Mattocks

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Federal Specification GGG-H-506a; 1942. Hoes, Mattocks, and Picks. Covers three classes of hoes, six classes of mattocks, and eleven classes of picks. Gives requirements for material, workmanship, design, sizes, hardness, eyes, handles, marking, finish, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-171; 1937. Pick Mattock; Intrenching, M-1910, With Handle.

References.—Standard sizes, *see* 616.60; tool steel, forged steel, *see* 603.22, 611.51; wooden handles, *see* 428.1, 428.20.

616.7 HARVESTING, PRUNING, AND TRIMMING TOOLS

616.71 Sickles and Scythes

U. S. Gov., Federal Specification GGG-H-608; 1944. Hooks; Grass (Sickles). Covers two types—(I) scythe and (II) sickle; and two classes—(A) heavy and (B) medium. Gives requirements for sizes, long handle grass hooks, material, workmanship, hardness, toughness, hand grips and handles, hand grip clearance, cutting edge and point, finish, marking, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-S-186; 1944. Scythes and Snaths. Covers scythes in two types—(I) one-piece blade construction and (II) three-piece welded blade construction; three classes—(A) bush, (B) grass, and (C) weed; and various sizes. Snaths are—class A, bush; and class B, grass and weed. Gives requirements for material, workmanship, hardness, toughness, finish, marking, and details for each type, class, and size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-177; 1941. Hook; Grass.

616.72 Shears, Grass and Hedge Cutting

616.73 Lawn Mowers

U. S. Gov., Federal Specification OO-M-671a; 1939. Mowers; Lawn, Hand. Covers lawn mowers of one type, commercially designated as double-drive, direct geared; class A, high wheel (10-in. diameter); and class B, low-wheel (8-in. diameter), 14-, 16-, 18-, or 20-in. sizes. Furnished in "regular" and "unbreakable" grades. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification OO-M-681; 1937. Amendment 2; 1944. Mowers; Lawn, Power. Covers four types—(I) rotating-reel, (II) rotary flat-knife, (III) sickle-bar, and (IV) combination. Gives requirements for classes, grades, sizes, material and workmanship, condition, construction, service requirements, balance, engine, clutches, controls, handle frame, lubrication, sulky, finish, tools, and details for each type, class, grade, and size; methods of sampling, inspection, and tests; and packaging, packing, and marking.

616.74 Tree Trimming Tools

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-134A; 1942. Trimmer; Tree.

616.8 TRACK TOOLS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications and Plans for Track Tools. Gives requirements for workmanship and finish, marking, inspection and tests, acceptance, shipment or delivery, and manufacturer's guarantee; and drawings. Includes clay pick, tamping pick, spike mauls, track wrenches, lining bar, rail tongs, tie tongs, timber tongs, spike puller, rail fork, claw bar, track adze, carpenters adze, sledge, tamping bar, chisel, tie plug punch, track gage, track shovel, ballast fork, and track tool handles.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R17-43; 1943. Heavy Forged Hand Tools. This recommendation covers the sizes, types, grades, and finishes of heavy forged hand tools that may be manufactured under the provisions of Schedule IV, Limitation Order L-157, as amended. Gives requirements for various kinds of bars, blacksmiths' anvil tools, hammers, mauls, sledges, hoes, mattocks, picks, railway track tools not elsewhere classified, tongs, miscellaneous forged hand tools, mine blasting hand tools, and mine breast drills.

U. S. Gov., Federal Specification GGG-H-86; 1942. Amendment 2; 1943. Hammers, Mauls, and Sledges. Covers 24 types of hammers, three types of mauls, and two types of sledges. Gives requirements for materials, workmanship, weight, forged heads, shape of head, striking faces, peens, eyes, handles, wedges, steel heads, hardness, finishes, corrosion protective coating, marking, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Clay pick and tamping pick, *see* 616.64; track wrenches, *see* 615.42; lining bar, claw bar, *see* 616.91; track adz, *see* 616.11; double faced sledge, *see* 615.22; tamping bars, *see* 616.61; track gage, *see* 615.82; tool handles, *see* 428.20, 428.29.

616.9 MISCELLANEOUS HAND TOOLS OTHER THAN METAL-WORKING

616.91 Jacks, Levers, and Leverage Bars

American Society of Mechanical Engineers. Sponsored by Bureau of Yards and Docks, U. S. Navy Dept. American Standards Assn., B 30.1-1943. Safety Code for Jacks. Applies to the construction and use of all portable manually operated jacks except those which are supplied with automobiles as part of their standard tool equipment. Covers purpose, definitions, rating, design and construction, and operating rules.

U. S. Gov., Army Air Forces. Specification 40281-D (5); 1945. Jack; Axle and Folding Tripod, General Specification for.

U. S. Gov., Army Air Forces. Specification 40411 (1); 1942. Jack; 5-Ton Axle.

U. S. Gov., Army Air Forces. Specification 40412 (2); 1943. Jack; 10-Ton Axle.

U. S. Gov., Army Air Forces. Specification 40413 (1); 1942. Jack; 17-Ton Axle.

U. S. Gov., Army Air Forces. Specification 40415-B; 1944. Jack; Tripod, 6 Ton.

U. S. Gov., Army Air Forces. Specification 40417-C; 1945. Jack; Tripod, 20 Ton.

U. S. Gov., Army Air Forces. Specification 40606-A; 1943. Jack; Ball Gun Turret Dolly.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R97-42; 1942. Bell-Bottom Screw Jacks. Establishes a list of 27 standard sizes—stand heights from 6 to 24 in., inclusive, and screw sizes from 1 to 3 in., inclusive.

U. S. Gov., Federal Specification GGG-B-101; 1932. Amendment 3; 1944. Bars; Chisel, Crow, Pinch, and Wrecking. Covers five types—(A) chisel; (B) crow, pinch point; (C) pinch, offset; (D) wrecking, gooseneck, claw and pinch point; and (E) wrecking, offset, claw and pinch point. Gives requirements for material, workmanship, marking, tolerances, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-J-51a; 1942. Amendment 1; 1944. Jacks. Covers ten types, including level-geared screw jacks, ratchet-lever jacks, planer or leveling jacks, screw jacks, automobile and motor truck jacks, and hydraulic jacks. Gives requirements for material, workmanship, design, warning device, capacities, finish and marking, top surface, bushings, levers, tolerances, hydraulic fluid, illustrations, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, marking for shipment.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Jacks; Garage, Hydraulic.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-195; 1940. Jack; Wagon.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-89-B; 1931. Jack, Type LC-13; and Axle, Type LC-31; for Supporting Cable Reels.

References.—Methods of testing, and general requirements for metals, *see* 600.1; tool steel, forged steel, *see* 603.32, 611.51; standard sizes, *see* 616.60.

616.92 Mallets

U. S. Gov., Marine Corps Specification, 1944. Mallet; Long Handle.

616.93 Trowels

U. S. Gov., Federal Specification GGG-T-671; 1932. Trowels; Plastering, Cement, Brick, and Pointing. Covers four types—(A) plastering, (B) cement, (C) brick, and (D) pointing. Gives requirements for marking, handles, tolerances, blade, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

616.99 Hand Tools Not Elsewhere Classified

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specifications for Packing Tools for Journal Boxes. Dimensional drawings of packing iron or horn, and packing hook made of spring steel.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-42-2; 1944. Tools; Special Airframe and Airframe Accessories, Hand.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Cache; Fire-Tool, 100-Man, Portable.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 262. Peavy.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 334. Swatter; Fire.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 352. Tool; Brown.

U. S. Gov., Federal Specification W-P-796; 1943. Pullers; Fuse. For use as tools for gripping cartridge fuses while they are being removed or installed and to serve as safeguards against shock by obviating the necessity for placing the hands near live parts. Covers one type; two classes—(A) for shipboard use or for use in damp places, and (B) for land use in dry places; and four sizes. Gives requirements for material, workmanship, design, insulating material, mechanical strength, identification, and details for each class and size; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Federal Specification GG-B-591; 1944. Borers; Cork. Covers two types—(I) without handles, and (II) with handles; two grades—(A) brass, and (B) stainless steel. Gives requirements for brass, steel, workmanship, tube, cleaning rod, handle, sizes, sets, finish, corrosion, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-W-348; 1939. Wire; Fish (for Electricians' and Plumbers' Use). Covers flat, oil-tempered, steel spring wire, in coils of 25, 50, 75, 100, 150, or 200 ft. Gives chemical composition, sizes, physical properties, and permissible variations; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-I-671; 1942. Irons; Calking, Wood. Covers eleven types and classes. Gives requirements for material, workmanship, sets, creases, shanks, hardness, finish, marking, shapes, and sizes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1943. Hook; Box.

U. S. Gov., Marine Corps Specification, 1928. Iron; Branding, "U.S.M.C.".

U. S. Gov., Marine Corps Specification, 1938. Sword and Scabbards (Noncommissioned Officers).

U. S. Gov., Marine Corps Specification, 1933. Whistle; Complete With Chain (Noncommissioned Officer's).

U. S. Gov., Navy Dept. Specification 41C23c; 1939. Tools, Calking; Chisels; Chisel Blanks; for Metal.

U. S. Gov., Navy Dept. Specification 40T2d; 1936. Tools; Pneumatic, Portable.

U. S. Gov., Navy Dept. Specification 41C24; 1935. Combs; Graining.

U. S. Gov., Navy Dept. Specification 41F7a; 1944. Fids; Hand, Sailmakers'.

U. S. Gov., Navy Dept. Specification 41L2a; 1924. Ladles; Deck-Paying.

U. S. Gov., Navy Dept. Specification 41N2b; 1938. Needles; Sailmakers'.

U. S. Gov., Navy Dept. Specification 41P25a; 1941. Prickers; Sailmakers'.

U. S. Gov., Navy Dept. Specification 41S28a; 1938. Shears; Sailmakers' or Tailors'

U. S. Gov., Navy Dept. Specification 41S39a; 1944. Syringes; Oil.

U. S. Gov., Navy Dept. Specification 41T21a; 1939. Tools; Extracting, Stuffing-Box-Packing.

U. S. Gov., Navy Dept. Specification 41T27; 1942. Tools; Nonsparking.

U. S. Gov., Navy Dept. Specification 57C58; 1944. Corkscrews; Automatic, With Crown-Puller.

U. S. Gov., Navy Dept. Specification 64T5b; 1943. Tongs; Ice.

U. S. Gov., Navy Dept. Specification 74W1; 1944. Whistles; Signaling.

U. S. Gov., Treasury Dept., Procurement Div., 232A; 1939. Drills; Pneumatic, Rock, Hand-Held. Covers one type, in two sizes—approximately 45 lb. and 58 lb. Gives requirements as to construction, valves, chuck, rotation, blowing means, handle, lubrication, weight, and bore and stroke; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept. Procurement Div., 545A; 1942. Cleaners; Flexible, With Auger Heads. Covers two types—(I) multi-coiled wire construction, and (II) single coiled wire construction, for water closets and drain pipes. Gives requirements for wire member, handle, auger head, and tabular guide for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 17-146; 1924. Iron; Calking, Set of 3, Nos. 1, 2, and 3 Crease.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 39-6; 1943. Wringer; Roller Type, Rubber, 42-Inch.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-13; 1941. Crimper; Cap, With Fuze-Cutter Combination.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-184; 1939. Presser; Cork.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-185; 1939. Corkscrew.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-186; 1939. Borer; Cork.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-187; 1939. Extractor; Cork.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-189; 1939. Opener; Box.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-190; 1939. Screw; Bench, Iron.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-37; 1939. Corkscrew; Folding.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-83; 1939. Tongs; Ice.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-74; 1921. Whistle; Company and Battalion Commander, Thunderer, and Boatswain.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-163A; 1938. Iron; Branding.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-174; 1938. Stencil-Outfit; Complete, With Figures and Letters, 1/2-Inch and 1 Inch.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-175; 1939. Set for Snap Fasteners and Eyelets.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-183; 1941. Holder; Tool, Hollow Handle, With Tools.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-198; 1942. Clamp; Saddlers', Stitching.

U. S. Gov., Veterans Administration. Specification VA-M-154a; 1938. Faucet Refacing Tool.

References —Spring steel, *see* 603.33.

617. FURNITURE HARDWARE, BUILDERS HARDWARE, AND PLUMBING

617.0 GENERAL ITEMS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS22-40; 1940. Builders' Hardware. This standard records standard nomenclature, definitions, finishes, handing rules, mortises, and general practices for builders' hardware (nontemplate) as regards domestic use. Initiated by manufacturers, represented by Manufacturers Advisory Committee on Standardization of Builders' Hardware.

617.1 HANGERS, HINGES, HASPS, AND STAPLES

617.11 Sash-Pole Hangers, Hooks, and Sash-Pole Plates

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf, and Miscellaneous. Includes plates. Covers kick, letter box, and sash pull plates. Gives requirements for material, finish, design, and dimensions for each type. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes pole hangers. Gives dimensional requirements for two types of hangers made of bronze and case iron. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes poles, sash. Gives requirements for oak sash pole chucked to fit sash pole hook and for bronze hook on handle of japanned or enameled steel tubing. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to save steel for handles and bronze for hooks.

References.—Gray cast iron, *see* 611.11; cast bronze, *see* 646.41.

617.12 Hinges

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS9-33; 1933. Builders' Template Hardware. This standard covers dimensions, clearances, tolerances, screw sizes, and varieties of template hinges and cylinder-lock parts for application to hollow metal doors. Includes dimensional diagrams for cylinder locks and various sizes of template butt hinges.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS22-40; 1940. Builders' Hardware (Nontemplate). Includes hands of casement-sash trim, plates for double-acting floor hinges, and loose-joint butt hinges. Recommends sizes for nontemplate butt hinges, number of hinges, paint clearances, weights and thicknesses, definitions, architectural details and lists standard finishes.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes blind hardware. Gives requirements for material, finish, design, and sizes of hinges, fasteners, and turnbuckles for blinds. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal.

U. S. Gov., Federal Specification FF-H-116b; 1940. Amendment 1; 1945. Hardware; Builders', Hinges (Nontemplate). Covers various types and grades of hinges and spring hinges, including full mortise, full surface, half surface, garage, scuttle, spring, strap, and tee. Gives dimensional and detail requirements, including illustrations; requirements for material and workmanship; tables of expected frequency of operation of doors; standard hardware finishes; type numbers of regular weight and extra heavy butt hinges; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-FF-H-116B, July 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

U. S. Gov , Federal Specification FF-H-136; 1936. Hardware and Fittings; (for) Lavatory Partitions and Inclosures. Covers hardware and fittings for lavatory stall and shower partitions and inclosures of marble, slate, or glass. Types for marine use are not included. Includes bolts, latches, screw fastenings, partition fittings, gravity and spring hinges, hooks, top and bottom partition standards, strikes, top rail and shower curtain rods and fittings. Gives requirements covering dimensions, illustrations, composition of material used, workmanship, fastenings, finish, and details; methods of inspection and tests; and packing and marking. Emergency Alternate Federal Specification E-FF-H-136, July 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

U. S. Gov., Navy Dept. Specification 42H34f; 1944. Hinges; Butt.

U. S. Gov., Navy Dept. Specification 42H35b; 1944. Hinges (Butts); Fast-Pin, Ball-Tipped, for Airtight Metal Joiner Doors.

References.—Cast iron, malleable iron, *see* 611.11, 611.21; wrought-iron plates, *see* 604.14; cast brass, *see* 645.21; cast and wrought bronze, *see* 646.41, 646.21; nickel plating, zinc coatings, *see* 600.3.

617.13 Hasps and Staples

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes hasps, hinge. Gives sizes of hasps, sizes of screws, and minimum thickness of metal for open and safety patterns. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal.

References.—Zinc coatings, *see* 600.3.

617.2 LOCKS, LATCHES, AND LOCK PARTS

617.21 Locks

Underwriters' Laboratories, Inc. Standards for Elevator Electric Contacts and Elevator Hoistway Door Interlocks, 1942. Covers elevator electric contacts for hoistway and car doors or gates and embodies the requirements of the Safety Code for Elevators, Dumbwaiters and Escalators, ASA17.1-1937. Includes requirements for design, construction, and performance tests.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS9-33; 1933. Builders' Template Hardware. This standard covers dimensions, clearances, tolerances, screw sizes, and varieties of template hinges and cylinder lock parts for application to hollow metal doors. Includes dimensional diagrams for standard fronts and strikes, and for various sizes of template butt hinges.

U. S: Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS22-40; 1940. Builders' Hardware (Nontemplate). Includes rules for hand of locks; dimensions for regular and special backsets for mortise door locks and latches; recommendations for master keying standard size and larger cylinders, lock fronts, flush bolts, definitions, architectural details, and lists standard finishes.

U. S. Gov., Federal Specification FF-H-106; 1933. Hardware; Builders', Locks and Lock Trim. Includes bit key and cylinder locks, latches, bolts, cylinder collars, escutcheons, handles, knobs, plates, pulls, roses, and dummy trim. Hardware for marine use is not included. Covers general requirements relating to dimensions, illustrations, construction, fastenings, finish, chromium and nickel plating, zinc and cadmium coatings, japan coating, lacquer, and material and workmanship; method of inspection and test; and packaging, packing, and marking. Emergency Alternate Federal Specification E-FF-H-106, June 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-P-101b; 1944. Padlocks. Covers eight types of padlocks. Gives requirements for types and sizes, material, workmanship, illustrations, tolerance on size and weight, finish, keys, marking, duplicate keys and change numbers, solid cases, lock mechanism, chain, tests, and details; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 42L6a; 1923. Locks; Desk (Roll-Top).

U. S. Gov., Navy Dept. Specification 42L13f; 1944. Locks; Door and Drawer, Metal and Wood (Shipboard Use).

U. S. Gov., Navy Dept. Specification 42 L 28c; 1944. Locks; Combination, Safe-Locker.

U. S. Gov., Navy Dept. Specification 42L29b; 1944. Locks; Latch, Upright.

U. S Gov., Navy Dept. Specification 42P12g; 1944. Padlocks.

References.—Locks for safes, *see* 613.5; desk locks, *see* 613.4; padlock eyes, *see* 617.23; bolt locks, *see* 617.61; methods of testing, general requirements for metals, *see* 600.1; cast iron, *see* 611.11, 611.21; cast bronze, *see* 646.41.

617.22 Latches

U. S. Gov., Federal Specification FF-H-106; 1933. Hardware; Builders', Locks and Lock Trim. Includes bit key and cylinder locks, latches, bolts, cylinder collars, escutcheons, handles, knobs, plates, pulls, roses, and dummy trim. Hardware for marine use is not included. Covers general requirements relating to dimensions, illustrations, construction, fastenings, finish, chromium and nickel plating, zinc and cadmium coatings, japan coating, lacquer, and material and workmanship; method of inspection and test; and packaging, packing, and marking. Emergency Alternate Federal Specification E-FF-H-106, June 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes latches. Covers one type of secret gate latch made of cast bronze, single-acting; and three types of thumb latches made of wrought steel, zinc-coated. Gives requirements for size, design, and finish. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Navy Dept. Specification 42L20c; 1944. Latches; Door (Metal), Rim.

References.—Methods of testing, general requirements for metals, *see* 600.1; cast iron, *see* 611.11, 611.21; cast bronze, *see* 646.41; zinc coatings and tests, *see* 600.3.

617.23 Lock Parts

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS9-33; 1933. Builders' Template Hardware. This standard covers dimensions, clearances, tolerances, screw sizes, and varieties of template hinges and cylinder lock parts for application to hollow metal doors. Includes dimensional diagrams for standard fronts and strikes, and for various sizes of template butt hinges.

U. S. Gov., Federal Specification FF-H-106; 1933. Hardware; Builders', Locks and Lock Trim. Includes bit key and cylinder locks, latches, bolts, cylinder collars, escutcheons, handles, knobs, plates, pulls, roses, and dummy trim. Hardware for marine use is not included. Covers general requirements relating to dimensions, illustrations, construction, fastenings, finish, chromium and nickel plating, zinc and cadmium coatings, japan coating, lacquer, and material and workmanship; method of inspection and test; and packaging, packing, and marking. Emergency Alternate Federal Specification E-FF-H-106, June 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

References.—Knobs and handles, *see* 617.31, 617.32; methods of testing, general requirements for metals, *see* 600.1; zinc coatings and tests, *see* 600.3; cast bronze, *see* 646.41.

617.3 KNOBS, HANDLES, AND PULLS

617.31 Door Knobs

U. S. Gov., Federal Specification FF-H-106; 1933. Hardware; Builders', Locks and Lock Trim. Includes bit key and cylinder locks, latches, bolts, cylinder collars, escutcheons, handles, knobs, plates, pulls, roses, and dummy trim. Hardware for marine use is not included. Covers general requirements relating to dimensions, illustrations, construction, fastenings, finish, chromium and nickel plating, zinc and cadmium coatings, japan coating, lacquer, and material and workmanship; method of inspection and test; and packaging, packing, and marking. Emergency Alternate Federal Specification E-FF-H-106, June 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

617.32 Door and Drawer Handles

References.—Door locks and handles for automobiles, *see* 722.33; methods of testing, general requirements for metals, *see* 600.1; cast bronze, *see* 646.41; door and drawer pulls, *see* 617.33.

617.33 Door and Drawer Pulls

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes pulls. Covers various types of door, drawer, and knob pulls made of cast bronze and steel. Gives dimensions and drawings for the several types. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements admitting use of plastic, in order to conserve metal, especially bronze.

References.—Cast bronze, *see* 646.41; cast iron, *see* 611.11, 611.21; door and drawer handles, *see* 617.32.

617.34 Push and Kick Plates and Bars

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf, and Miscellaneous. Includes bars. Gives requirements for material, finish, design, and dimensions for seven types of push and grab bars for single- and double-acting doors. Similar requirements are also given for door or window-guard bars and clothes-hanger bars. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes plates. Covers kick, letter box, and sash pull plates. Gives requirements for material, finish, design, and dimensions for each type. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

References.—Cast bronze, *see* 646.41; bronze plates and sheets, *see* 646.21; bronze bars and rods, *see* 646.12, 646.31.

617.35 Sash Lifts

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes lifts. Gives requirements for material, design, finish, and dimensions for various types of lifts including hook sash, flush sash, bar sash, and screen. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve material, especially bronze.

References.—Methods of testing, general requirements for metals, *see* 600.1; cast bronze, *see* 646.41.

617.4 CHECKS, CATCHES, AND FASTENERS

617.41 Door Closers and Checks

American Hospital Assn., 4-22. Door Closers; Builders' Hardware. Covers mechanical devices for automatically closing and controlling the action of swinging doors by means of a suitable combination of springs and liquid- or air-controlled checks. Based on U. S. Gov., Federal Specification FF-H-121a for Hardware, Builders'; Door-Closers, referred to below.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS22-40; 1940. Builders' Hardware (Nontemplate). Recommended applications for six sizes of overhead door closers, checking floor hinge marking, applicable to Federal Specification FF-H-121.

U. S. Gov., Federal Specification FF-H-121a; 1937. Hardware, Builders'; Door Closers. Covers mechanical devices for automatically closing and controlling the action of swinging doors by means of a suitable combination of springs and liquid- or air-controlled checks. Gives requirements for types and sizes, material and workmanship, illustrations, fastenings, checking fluid, marking of door closers, and details; methods of inspection and test; and packaging, packing, and marking. Emergency Alternate Federal Specification E-FF-H-121a, July 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

References.—Cast bronze, *see* 646.41; cast iron, *see* 611.11; cast brass, *see* 645.21; checking floor hinges, *see* 617.12.

617.42 Catches

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes catches. Gives requirements for material, finish, design, and various sizes of elbow, friction, cupboard, screen door, and transom catches. Emergency Alternate Federal Specification E-FF-H-111, July

1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Navy Dept. Specification 42C11c; 1943. Catches; Cupboard or French-Window.

References.—See references under 617.41.

617.43 Door, Casement, and Sash Fasteners

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS22-40; 1940. Builders' Hardware (Nontemplate). Includes casement sash trim, exit bolts, push buttons; gives standard nomenclature, definitions, finishes, handing rules, mortises, and general practices for builders' hardware (nontemplate) as regards domestic use.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes adjusters. Gives requirements for material, finish, design, lengths, and sizes of rods and bases and other features of casement and window stop adjusters. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes blind hardware. Gives requirements for material, finish, design, and sizes of hinges, fasteners, and turnbuckles for blinds. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes fasteners. Gives requirements for material, finish, design, and dimensions for fasteners used for casement, cellar window, door, sash, scuttle, and storm sash. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Navy Dept. Specification 42L25e; 1944. Locks; Sash and Blind.

References.—Chain for fasteners, *see* 603.56; *see* references under 617.41.

617.44 Door Holders and Stops

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes door holders and stops. Gives requirements for material, finish, design, and sizes of several types of door holders and stops including garage doors. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

References.– See references under 617.41.

617.5 TRANSOM AND SASH DEVICES

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes adjusters, casement and window stop; transom lifters, 16 types; operators, sash, scuttle, skylight, and transom types; pivots, sash or transom; sash pulleys; sash cord irons; and sash weights. Gives requirements for material, workmanship, finish, design, dimensions, other details, and drawings of each item. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve critical metals.

References.—Sash pull plates, *see* 617.11; sash lifts, *see* 617.35; sash chains, *see* 603.56; window spring bolts, *see* 617.61; sash fasteners, *see* 617.43; transom catches, *see* 617.42; sash pulleys, *see* 617.9; transom eyes, *see* 617.11.

617.6 BOLT LOCKS, BRACKETS, AND HOOKS

617.61 Bolt Locks

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes bolts. Covers barrel, cane, chain, cremone, espagnolette, flush, foot, garage door, lavatory door, mortise, neck, square, surface, and window spring bolts. Gives requirements for iron, steel, brass, or bronze; and gives dimensional requirements, design, and finish for the various sizes. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

References.—Cast brass, *see* 645.21; cast bronze, *see* 646.41; cast iron, *see* 611.11, 611.21; nickel plating and zinc coatings, *see* 600.3; nickel bronze, *see* 655.3.

617.62 Brackets, Handrail and Shelf

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 65. Brackets; Ax and Shovel.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes brackets. Gives requirements for material, finish, design, and sizes of hand rails and shelf brackets and shelf rests. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes requirements for corrosion-resisting steel or nickel-copper alloy metal shelf with two metal brackets. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

References.—See references under 617.61.

617.63 Hooks

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 180. Hook; Brush.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes hooks and hooks and eyes. Gives requirements for material, finish, design, and sizes of hooks including ceiling, coat, door, hat, and sash pole, and hooks and eyes. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures; (for) Land Use. Includes requirements for three types of coat hooks made of metal, including long and short arm, single arm, and two equal arms. Covers wall flanges of various designs. Emergency Alternate Federal Specification E-WW-P-541a;

1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Navy Dept. Specification 27H3b; 1944. Hooks, Belt; and Hooks-and-Eyes.

U. S. Gov., Navy Dept. Specification 42H2d; 1943. Hooks; Cup.

U. S. Gov., Navy Dept. Specification 42H5c; 1943. 1943. Hooks; Door.

U. S. Gov., Navy Dept. Specification 42H28c; 1942. Hooks; Snap-Bolt, Swivel-Eye, With Rings.

U. S. Gov., Navy Dept. Specification 64H1a; 1943. Hooks; Meat.

References.—See references under 617.61.

617.7 PLUMBING FIXTURES

617.70 General Items

617.71 Vitreous and Porcelain Ware

References.—Plumbing practice and symbols, *see* 600.6; porcelain and vitreous ware tubs, sinks, lavatories, and water closets, *see* 532.23; metal and cast iron bath tubs, lavatories, and sinks, *see* 612.21, 612.23.

617.72 Slate, Soapstone, Marble, and Glass Plumbing

References.—Plumbing practice and symbols, *see* 600.6; slate laundry trays, sinks, water-closet and bath inclosures, slop hoppers, urinals, *see* 511,52; marble water-closet and bath inclosures, *see* 511.3; soapstone inclosures, *see* 511.6; glass inclosures, *see* 521.8.

617.73 Plumbing Trimmings and Fittings

References.—Plumbing practice and symbols, *see* 600.6; pipe fittings, *see* 607.14, 607.2, 607.3, 607.4; valves and cocks, *see* 607.6; iron floor drains and traps, *see* 611.14; iron roof drains, *see* 611.19; brass drains and traps, *see* 645.4; brass water-closet floor flanges, *see* 645.4; trimmings for water-closet inclosures and bath rooms, *see* 645.4; floor, wall, and ceiling plates, *see* 645.4; seats and seat hinges for water-closet bowls, *see* 532.23.

617.74 Plumbing Stop Cocks and Valves

References.—Plumbing practice and symbols, *see* 600.6; valves and cocks, *see* 607.6, 645.4.

617.75 Pipe and Pipe Covering, Plumbing

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS95-41; 1941. Lead Pipe. This standard covers chemical composition, inside and outside diameters, weight classification, weight per foot, defects, certification and labeling of one grade of lead pipe. Maximum working pressures are included to assist in the selection of the proper classification of lead pipe for various purposes. Sponsored by Lead Industries Assn.

References.—Plumbing practice and symbols, *see* 600.6; cast-iron pipe, *see* 607.11, 607.12; malleable iron, wrought iron, and steel pipe, *see* 607.2, 607.3, 607.4; eaves troughs, *see* 607.5, 642.9; copper pipe, brass pipe, *see* 642.23, 645.23; concrete pipe, vitrified clay pipe, *see* 518.67, 531.5; heating and ventilating equipment, *see* 792; house heating boilers and radiators, *see* 614.4; pipe coverings, *see* 707.4.

617.76 Bathtubs and Sinks (Enameled Iron or Steel)

References.—Hollow ware, *see* 612.2.

617.79 Miscellaneous Plumbing Fixtures

American Hospital Assn., 58-7. Metal Partitions for Toilets and Showers. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards Simplified Practice Recommendation R101-29.

American Society of Mechanical Engineers. Sponsored by American Public Health Assn. American Standards Assn., A 40.4-1942. Air Gaps in Plumbing Systems. For plumbing fixtures and all water-connected devices. Gives definitions, minimum required air gap dimensions, tanks or vats with water inlets below the floor-level rim, water closet tanks, drinking fountain nozzles, minimum air gaps for generally used plumbing fixtures, and illustrations.

American Society of Mechanical Engineers. Sponsored by American Public Health Assn. American Standards Assn., A 40.6-1943. Backflow Preventers in Plumbing Systems. For plumbing fixtures and all water-connected devices. Gives definitions, requirements, tests, and illustrations.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R101-40; 1940. Metal Partitions for Toilets and Showers. This recommendation establishes a simplified schedule of standard stock sizes of partitions, fronts, doors, and posts for metal toilet and dressing-room and shower enclosures, together with recommended dimensions of enclosures. Sponsored by manufacturers now represented by National Metal Compartment Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS96-41; 1941. Lead Traps and Bends. This standard covers chemical composition, markings, weights, and dimensions, and provisions for allowable deviations, for one grade in various sizes of full S-traps, 1/2 S- or P-traps, drum traps, and bends. Sponsored by the Lead Industries Assn.

U. S. Gov., Federal Specification FF-D-396b; 1941. Dispensers; Soap. Covers one grade; five types—(I) liquid, rigid; (II) liquid, tilting; (III) powder, rigid; (IV) powder, tilting; and (V) cake, rigid; and three classes—(A) glass, (B) metal, and (C) plastic composition. Covers material and workmanship, general requirements, detail requirements for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification FF-H-136; 1936. Hardware and Fittings; (for) Lavatory Partitions and Inclosures. Covers hardware and fittings for lavatory stall and shower partitions and inclosures of marble, slate, or glass. Types for marine use are not included. Includes bolts, latches, screw fastenings, partition fittings, gravity and spring hinges, hooks, top and bottom partition standards, strikes, top rail and shower curtain rods and fittings. Gives requirements covering dimensions, illustrations, composition of material used, workmanship, fastenings, finish, and details; methods of inspection and tests; and packing and marking. Emergency Alternate Federal Specification E-FF-H-136, July 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures; (for) Land Use. Includes requirements for shower baths. Gives detail requirements of outfits made of brass and dimensional diagrams of concealed and exposed showers with hand and mixing valves of several types; also requirements for shower heads, piping and stops, hand and thermostatic mixing valves, thermostats, curtains, and curtain rails; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Federal Specification WW-P-542; 1940. Plumbing-Fixtures, for Land Use; Formed-Metal Plumbing-Fixtures. For bathtubs, lavatories, sink and laundry-tray combinations, kitchen sinks, and cabinet sink tops. Covers plumbing fixtures of enameled formed metal. Gives requirements for material of base, enamel, dimensions and variations, rigidity, marking, and details for each item; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-542; 1942, changed certain requirements in order to conserve certain strategic and critical materials.

U. S. Gov., Navy Dept. Specification 30A1; 1944. Accessories; Lavatory and Shower-Stall, Plastic.

U. S. Gov., Navy Dept. Specification 30D3a; 1944. Dishes; Soap, Metal (Pressed).

U. S. Gov., Navy Dept. Specification 30H3a; 1944. Holders; Toilet-Paper (Roll).

U. S. Gov., Navy Dept. Specification 30P2; 1944. Plugs; Drain, Plastic.

U. S. Gov., Navy Dept. Specification 30R4; 1941. Rings; Toilet-Set (Metal, Stateroom).

U. S. Gov., Navy Dept. Specification 30R5; 1943. Rings; Toilet-Set (Crockery, Stateroom).

U. S. Gov., Treasury Dept., Procurement Div., 545A; 1942. Cleaners; Flexible, With Auger Heads. Covers two types—(I) multi-coiled wire construction, and (II) single coiled wire construction, for water closets and drain pipes. Gives requirements for wire member, handle, auger head, and tabular guide for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Plumbing practice and symbols, *see* 600.6; nickel plating, *see* 600.3; iron and steel sheets and plates, *see* 604.2, 604.1.

617.9 MISCELLANEOUS BUILDERS AND FURNITURE HARDWARE

American Hospital Assn., 73-1. Cushion Glides. Covers one type and one grade but with five types of attachments—(1) nail, (2) grip neck item, (3) machine screw and nut, (4) spring socket, and (5) rubber expansion socket; material and workmanship; detail requirements; marking and packing; and general considerations.

American Hospital Assn., 73-4. Light Duty Swivel Casters With 2-Inch Diameter Wheels. Covers ball bearing swivel casters with 2 in. cushion tread, composition wheels, and of two types—(I) for wood furniture and (II) for metal furniture; materials and workmanship; general requirements; detail requirements; testing marking and packaging; and special considerations.

American Hospital Assn., 73-7. Light Duty Casters With 3-Inch Diameter Wheels, With or Without Brakes. Covers swivel and rigid types; material and workmanship; general requirements; detail requirements; tests; marking and packaging; and special considerations.

American Hospital Assn., 73-10. Swivel Type Plate Casters With 3-Inch or 3 1/2 Inch Diameter, Ball Bearing, Cushion Tread Wheels. Covers one grade, one class, and one type; material and workmanship; general and detail requirements; and marking and packaging.

American Hospital Assn., 73-13. Light Duty Swivel and/or Rigid Casters With 5-Inch Diameter Wheels With and Without Brakes. Covers one grade, one class, and two types—(I) swivel and (II) rigid; material and workmanship; general and detail requirements; tests; marking and packaging; and special considerations.

American Hospital Assn., 73-16. Medium Duty Plate Type Casters, Swivel and Rigid, With 5-Inch Diameter, Ball Bearing, Rubber Tired Wheels. Covers two types—(I) swivel and (II) rigid; materials and workmanship; general and detail requirements; marking and packaging; and special considerations.

American Hospital Assn., 73-19. Ball Bearing Rubber Tired Wheels, 26-Inch Diameter; and Casters Having 10-Inch Diameter, Ball Bearing, Rubber Tired Wheels; for Wheel Chairs. Covers material and workmanship; detail requirements; marking and packaging; and special considerations.

American Hospital Assn., 73-22. Stem Type Casters, Swivel and Rigid, With 8-Inch Diameter, Ball Bearing, and Rubber Tired Wheels. Covers one grade, one class, and two types—(I) swivel and (II) rigid; material and workmanship; general and detail requirements; marking and packaging; and special considerations.

American Hospital Assn., 73-25. Plate Type Caster, Swivel and Rigid, With 8-Inch Diameter, Ball Bearing, Rubber Tired Wheels. Covers material and workmanship; general and detail requirements; marking and packaging; and special consideration.

American Hospital Assn., 73-28. Stem Type Casters, Swivel and Rigid, With 10-Inch Diameter, Ball Bearing, Rubber Tired Wheels. Covers material and workmanship; general and detail requirements; marking and packaging; and special consideration.

American Hospital Assn., 73-31. Ball Bearing, Rubber Tired Wheels, 5-Inch Diameter. Covers material and workmanship; general and detail requirements; marking and packaging; and special consideration.

American Hospital Assn., 73-34. Ball Bearing, Rubber Tired Wheels, 8-Inch Diameter. Covers two types; material and workmanship; general and detail requirements; marking and packaging; and special consideration.

American Hospital Assn., 73-37. Ball Bearing, Rubber Tired Wheels, 10-Inch Diameter. Covers material and workmanship; general and detail requirements; marking and packaging; and special considerations.

American Hospital Assn., 73-40. Ball Bearing, Rubber Tired Wheels, 24-Inch and 26-Inch Diameter. Covers material and workmanship; general and detail requirements; marking and packaging; and special consideration.

Underwriters' Laboratories, Inc. Standard for Sliding Hardware for Standard, Horizontally Mounted Tin-Clad Fire Doors, Subject 14(b); 1943. Covers flat track hardware for single-slide two- and three-ply standard tin-clad doors horizontally mounted for use in the protection of openings in walls. Gives general requirements, construction and materials, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Swinging Hardware for Standard Tin-Clad Fire Doors, Mounted Singly and in Pairs. Covers hardware for swinging two-ply and three-ply standard tin-clad fire doors for use in the protection of openings in walls as designated by the National Board of Fire Underwriters. Gives requirements for hinges for doors mounted singly and in pairs, locking mechanism, nonautomatic double-acting bolt mechanism, installation instructions, painting, marking, inspection of listed product, and instructions to inspectors.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes blind hardware. Gives requirements for material, finish, design, and sizes of hinges, fasteners, and turnbuckles for blinds. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes door buttons. Cast iron or wrought steel, zinc-coated, without plates, in lengths of 1 1/2 and 2 in. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve zinc.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes operators. Gives requirements for material, finish, design, operation, and dimensions for several types of operators, including sash, scuttle, skylight, and transom types. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes plates. Covers kick, letter box, and sash pull plates. Gives requirements for material, finish, design, and dimensions for each type. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification FF-P-806; 1944. Pulleys; Eye, Single-Sheave, With Attachment for Balkan Frame, for Hospitals. Covers one type, one grade and two classes—(A) with clamp attachment and (B) with U attachment. Gives requirements for material, workmanship, general description, pulley block and sheave, rivet, pulley eye, attachment, bolt and nut, finish, assembly, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 42B3c; 1943. Buttons; Turn.

U. S. Gov., Navy Dept. Specification 42H38c; 1945. Handles; Chest, Surface.

U. S. Gov., Navy Dept. Specification 42L28c; 1925. Links; Drop-Leaf, Secretary-Bureau.

U. S. Gov., Navy Dept. Specification 42P15; 1944. Plastic-Ware (Alternate for Hardware).

U. S. Gov., Treasury Dept., Procurement Div., No. 420; 1940. Casters; Hospital-Bed. Shall be of the ball-bearing swivel type in two classes—(A) soft rubber tread molded rubber composition wheel and (B) soft rubber tired metal wheel; and two sizes—3 and 5 in. diameter. Gives requirements for wheels, axles, offset of yoke or horn, finish, marking, interchangeability, sockets, brakes, stem, swivel, ball-bearings, shape, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 29-76; 1932. Bracket; Flagpole, Metal, Adjustable.

U. S. Gov., U. S. Army, Medical Dept. Specification 29-78; 1937. Caster; Bed, Hospital.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 17-48; 1920. Holder; Card, for Iron Bunks.

U. S. Gov., U. S. Maritime Commission. Specification 27-MC-32a; 1943. Curtains (With Fixtures); Port, Door, and Passageway. Covers three types of curtains and six classes of fixtures. Gives requirements for materials, workmanship, construction, dimensions, hems, thread, stitching, metal fittings, fixtures, installation, sampling, inspection, and tests.

U. S. Gov., Veterans Administration. Specification VA-M-331; 1944. Bed Casters; 3-Inch.

619. MISCELLANEOUS IRON AND STEEL MANUFACTURES

619.1 FIREARMS AND ORDNANCE

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R31-44; 1944. Loaded Paper Shot Shells. This recommendation establishes a list of standard sizes and varieties of paper shot shells for low cup (smokeless), progressive-burning powder (medium cup), and progressive-burning powder (high cup); and includes trap loads, skeet loads, short-range loads, rifled slug loads, and buck-shot loads. Covers shell gage, weight of powder, weight of shot, shot sizes, length of shell unloaded, and maximum height of brass cup. Sponsored by Sporting Arms and Ammunition Manufacturers Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R62-44; 1944. Metallic Cartridges. This recommendation establishes a list of types and varieties of metallic cartridges including smokeless powder, black powder, and Lesmok powder for rimfire cartridges (ball, shot, and blanks) and smokeless powder and black powder for center-fire cartridges (ball, blanks, and shot). Sponsored by the Sporting Arms and Ammunition Manufacturers Institute.

U. S. Gov., Marine Corps Specification, 1937. Cartridges; Caliber .22, Long Rifle, (Noncorrosive, Nonmercuric).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-82-1; 1942. Mount; Combination, Gun, M-23.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-82-2; 1942. Mount; Truck, M32.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-3510; 1934. Reel, Measuring; and Frame.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-5110; 1941. Cutter; Cable, Submarine Mine.

U. S. Gov., U. S. Maritime Commission. Specification 1-MC-1a; 1941. Guns; Line-Throwing, and Equipment. Guns shall be mounted and muzzle-loading. Gives requirements for materials, workmanship, size, weight, mount, equipment, tests, packing, and marking.

References.—Methods of testing, general requirements for metals, *see* 600.1; cast bronze, *see* 646.41; forged steel, 611.51; cartridge brass, *see* 644.21, 645.9; explosives, *see* 862, 863; flax shot line, *see* 331.21.

619.2 MANUFACTURES OF SHEET IRON AND SHEET STEEL

American Society of Mechanical Engineers. American Standards Assn., B32.1-1941. Preferred Thicknesses for Uncoated, Thin Flat Metals (Under 0.250 Inch). Provides a simplified system for designating the thickness of uncoated, thin flat metals and alloys by decimal parts of an inch. Gives table of preferred thicknesses.

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Steel referred to in this specification shall conform to the current specification A-7 for "Structural Steel for Bridges" of the American Society for Testing Materials.

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. This specification covers material used in overhead trolley construction, both direct and catenary suspension, and overhead feeder cable construction. Gives requirements as to general overhead line material, material for feeder construction, material for direct trolley suspension, and material for catenary suspension; also requirements as to workmanship and finish, and inspection and rejection.

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Wrought iron referred to in this specification shall conform to the current specification A-41 for "Refined Wrought-Iron Bars" of the American Society for Testing Materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS6; 1938. Survey of Roofing Materials in the Southeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Southeastern States is described. Detailed studies of roofing materials in Greensboro, N. C.; Columbia, S. C.; Savannah and Atlanta, Ga.; Jacksonville and Orlando, Fla.; Birmingham, Ala.; Knoxville, Tenn.; and Charleston, W. Va., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 2,500 miles of highway, is included. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS29; 1939. Survey of Roofing Materials in the Northeastern States. A survey of the weathering qualities and extent of use of the various roofing materials on dwellings in the Northeastern States is described, with numerous comparative references to a similar survey in the Southeastern States. Detailed studies of roofing materials in Wilmington, Del.; Philadelphia, Pa.; New Haven, Conn.; Boston, Mass.; Manchester, N. H.; Portland, Maine; Rutland, Vt.; and Albany and Syracuse, N. Y., are reported. A tabulation, by states, of the kinds of roofing materials used on more than 10,000 rural and small-town dwellings, along approximately 1,600 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on almost 21,000 rural and small-town dwellings along 4,000 miles of highway in 20 Eastern States. Forty-eight photographs, illustrating types of weathering of roofing materials and features of design and construction of roofs, are shown.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS84; 1942. Survey of Roofing Materials in the South Central States. A survey of the weathering qualities and of the extent of use of the various roofing materials on dwellings in the South Central States is described, with numerous references to similar surveys in the Southeastern, Northeastern, and North Central States. Detailed studies of roofing materials in Chattanooga and Memphis, Tenn.; Jackson, Miss.; New Orleans, La.; Houston, Dallas, San Antonio, and Amarillo, Tex.; Oklahoma City, Okla.; Little Rock, Ark.; and Louisville, Ky., are reported. A tabulation, by states, of the kinds of roofing materials used on 9,500 rural and small-town dwellings, along approximately 4,200 miles of highway between the cities listed above, is included; also a summary of the kinds of roofing materials used on more than 38,000 rural and small-town dwellings along approximately 11,000 miles of highway in the 37 states covered by the four surveys. Forty-eight photographs, illustrating types of weathering of roofing materials, and features of the design and construction of roofs, are shown.

U. S. Gov., Joint Army-Navy Specification JAN-M-59; 1944. Mats; Airplane Landing, Steel, Pierced Plank Type, in Bundles.

U. S. Gov., Navy Dept. Specification 23G6b; 1944. Guards; Rat.

References.— Iron and steel sheets and plates, *see* 604.2, 604.1; steel desks, lockers and cupboards, and office filing furniture, *see* 613.4, 613.5, 613.7; stoves, ranges, house heating furnaces, *see* 614; metal partitions for shower inclosures, *see* 617.79; switchboard panels of sheet steel, *see* 714.4; raceways of sheet iron or steel for electric wire, *see* 715.11; switch boxes and cabinets, *see* 715.12; electric signs, *see* 716.39; metal barrels, drums, tubs, kits, pails, *see* 951; metal cases, metal cans, *see* 954.21, 959.1; metal tanks, *see* 956.2, 726.1, 605.23; acetylene generators, *see* 997.5; illuminating torch, sheet steel, *see* 997.1; sheet metal hollow ware, *see* 612.20.

619.3 SCREW POSTS, METAL FENCE POSTS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Metal Fence Posts. Covers two classes.

Gives requirements for material; strength; ductility; workmanship; coating; special fabrication for line, end, corner, and gate posts; weight; and inspection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-40. Electric Fence.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-72. Posts; Steel Fence, Classes C and D.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-94. Fence; Wire, Classes C, D, and E, With Steel Posts.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-94. Posts; Steel (Wire Fence With Steel Posts, Classes C, D, and E).

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 81. Posts; Fence, Steel.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 19Yb; 1933. Wire Fencing; Nonclimbable. Includes requirements for metal fence posts.

U. S. Gov., Treasury Dept. Procurement Div., No. 538; 1942. Gates, Posts, Top Rails, and Reinforcing Wire (for Wire Fencing). This specification covers gates, posts, top rails, top reinforcing wire, and bottom reinforcing wire. Gates shall be single swing (one gate) or double swing (two gates). Posts shall cover following types—type I, corner; type II, end; type III, gate; and type IV, line. All structural members shall be steel and other members shall be steel, malleable iron, or wrought iron. Gives requirements for gate frame, latches, stops, keepers, hinges, and fabric for gates; details for various types of posts; top rails; top and bottom reinforcing wire; finish; details including tables concerning height, width, diameter, dimensions, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-1; 1930. Post; Screw.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-19; 1943. Post; Barbed Wire, Drive Type.

References.—Methods of testing and general requirements for metals, *see* 600.1; zinc coatings and tests, *see* 600.3; wooden fence posts, *see* 401.2.

619.4 BUOYS OF IRON OR STEEL

U. S. Gov., Army-Navy Aeronautical Specification AN-B-5-2; 1944. Buoys; Seaplane Mooring.

619.5 WATER FILTERS

619.6 GATES

U. S. Gov., Treasury Dept. Procurement Div. No. 538; 1942. Gates, Posts, Top Rails, and Reinforcing Wire (for Wire Fencing). This specification covers gates, posts, top rails, top reinforcing wire, and bottom reinforcing wire. Gates shall be single swing (one gate) or double swing (two gates). Posts shall cover following types—type I, corner; type II, end; type III, gate; and type IV, line. All structural members shall be steel and other members shall be steel, malleable iron, or wrought iron. Gives requirements for gate frame, latches, stops, keepers, hinges, and fabric for gates; details for various types of posts; top rails; top and bottom reinforcing wire; finish; details including tables concerning height, width, diameter, dimensions, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

619.9 MANUFACTURES OF IRON OR STEEL NOT COVERED IN ABOVE CLASSIFICATION

American Hospital Assn., 4-10. Wire Screen Cloth. Covers copper, commercial bronze (brass), bronze, iron or steel, galvanized (zinc coated), copper-nickel alloy, corrosion-resisting steel (chromium-nickel), aluminum alloy, iron or steel, japanned or painted, and chromium-nickel alloy.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for wrought iron fences, stairs, balconies, ladders, fire escapes, flagpoles, column guards, door guards and jambs, metal sash, metal sash operators, sidewalk doors, covers, and gratings; treads and thresholds, gratings and registers, and metal partitions.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Devices to Control the Splitting of Wood Ties. Covers only the type of antisplitting device made from a strip of steel and applied by driving it into an end of a tie. Gives material, chemical requirements, physical requirements, design, manufacture, variations, inspection and delivery.

American Society for Testing Materials, D 609-41 T; 1941. Tentative Method for Preparation of Steel Panels for Exposure Tests of Enamels for Exterior Service. Covers two procedures for the preparation of steel panels for exposure tests of enamels for exterior service. Test panels, preparation of panel surface, and application of finishing material.

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Part of this specification relating to general overhead line material covers items used in overhead line construction of all kinds, including feeder and trolley wire construction. Requirements are given for bolts and nuts, guy clamps, nub guards, guy hooks, porcelain strain insulators, guy plates, anchor rods, lag screws, pole steps, thimbles, and washers.

Open Steel Flooring Institute, Inc. Specifications for Grating. Covers steel gratings of open construction having riveted, welded, or interlocked joints, either of rectangular or reticulated design having parallel bearing bars and either straight or diagonal cross members. Includes requirements for workmanship, thickness and spacings of bars, fasteners, treads, cutting and bending, erection symbols, labeling, and finish.

Pin, Clip and Fastener Assn. Paper Fastener Physical Standards. Covers gages and diameters and widths of caps; gages, widths, and lengths of shank for available sizes of steel paper fasteners.

Pin, Clip and Fastener Assn. Physical Dimensions Brass and Steel Washers. Covers gage, diameter, and slot dimensions of steel washers for use in connection with paper fasteners.

U. S. Gov., Army Air Forces. Specification 14100; 1939. Grit; Steel, for Blast Cleaning.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-46. Louver; Automatic 18-Inch, Cable.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-310. Louver; Automatic, Motor-Operated.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R190-42; 1942. Stove Pipe and Accessories. The recommendation was initiated at the request of the War Production Board, and was developed in cooperation with representatives of the stove pipe industry. The purpose of the recommendation is to conserve metal required for the production of war materials, to simplify manufacture, and to reduce inventories of finished products. It eliminates from production a substantial number of varieties of stove pipe and accessories heretofore manufactured for general use.

U. S. Gov., Federal Specification FF-W-556; 1934. Amendment 1; 1944. Wool; Steel. Covers five Federal grades—00, 0, 1, 2, and 3. Gives requirements for material and workmanship and steel wool details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification GGG-F-311a; 1944. Figures and Letters; Stamping, Steel. Covers two types—(A) figures, heavy duty and medium duty; and (B) letters, heavy duty and medium duty. Gives requirements for material, workmanship, stock, characters, marking of stamps, sets, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 12T9a; 1942. Thimbles; Rope (Manila and Wire).

U. S. Gov., Navy Dept. Specification 41S36a; 1942. Spikes; Marline, Wire Rope.

U. S. Gov., Navy Dept. Specification 41T28; 1941. Tools; Tube-System (Shipboard Use).

U. S. Gov., Navy Dept. Specification 42I1d; 1944. Irons, Hand; and Irons, Leg.

U. S. Gov., Navy Dept. Specification 42T1e; 1943. Tags, Key; and Rings, Key.

U. S. Gov., Treasury Dept., Procurement Div., No. 548; 1942. Irons; Hand. Shall be of one grade and one type. Gives requirements for material, size (minimum opening for insertion of wrist and maximum and minimum inside circumference when locked); shape, jaw with lock, jaw without lock, weight, pins, connections, finish, and strength; sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2788; 1939. Muzzle; Horse, Steel Wire.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 29-28A; 1940. Marlinespike; Polished Steel, 12-Inch.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 29-47B; 1940. Shackle; 1-Inch, M-1915, Anchor and Mine, Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 29-48A; 1935. Sister-Hook; Mine Anchor.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-3294; 1940. Trip Hook M-4; 3-Ton, Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-3345; 1940. Iron; Grappling, Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-3440A; 1940. Plug; Compound, Submarine Mine.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-68; 1930. Currycomb M-1913.

U. S. Gov., Veterans Administration. Specification VA-G-70; 1933. Noiseless Glides for Furniture.

U. S. Gov., Veterans Administration. Specification VA-G-357; 1941. Sponges; Metal.

620-629 FERRO-ALLOYING ORES AND METALS, ALLOY STEELS AND MANUFACTURES

621. FERRO-ALLOYING ORES AND METALS

621.0 GENERAL ITEMS

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Ferrous Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers bars, rods, billets, forgings, wire and welding rod, sheet, strip, and welded and seamless tubing.

621.1 ORES, FERRO-ALLOYING

621.11 Chrome Ores

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Chromite. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

U. S. Gov., Navy Dept. Specification 50-O-1; 1924. Ore; Chrome, Ground.

References.—Iron ore, *see* 601.1; screen testing, *see* 601.0.

621.12 Manganese Ores

U. S. Gov., Federal Specification QQ-M-71; 1932. Manganese; Ore. Covers one grade. Gives requirements for material, form (lumps, crushed, or screened-to-size), and manganese content; methods of tests and inspection; and requirements for packing and marking.

References.—Iron ore, *see* 601.1; screen testing, *see* 601.0.

621.13 Silicon Ores

621.2 FERRO-ALLOYS

621.20 General Items

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No. 1; 1941. Possible

Substitutes for Nickel Steels. Deals only with constructional steels containing chromium, nickel, molybdenum, manganese, silicon, and vanadium. Covers carburizing steels, thorough-hardening steels, low-carbon alloy steels, and standard methods for sampling for check analysis and standard variations from specified chemical limits.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.2; 1941. Direct Consumption of Aluminum in the Steel Industry. A study of the proper utilization and distribution of aluminum used in the steel industry for purposes of deoxidation and alloying. Covers effect of a decrease in aluminum on steel production, steps taken to decrease aluminum consumption, grades of aluminum, and suggested method of distributing aluminum.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.3; 1941. Problems Involved in the Conservation of Manganese. A plan for evaluating conservation efforts is suggested and individual products are discussed in accordance with that plan. Covers requirements for manganese, high manganese shell steel, commercially high manganese steels, steel bars and forging billets, sheet and strip steel; wheels, axles, and heavy forgings; pipe, seamless tubing, carbon steel plates and structural shapes, steel piling, tin plate, rods and wire, standard tee rails, steel castings, and manganese-sulphur relationships.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.5; 1942. Possible Alternates for Nickel, Chromium, and Chromium-Nickel Constructional Alloy Steels. Covers possible alternates for chromium and nickel constructional alloy steels, possible alternates for the standard carburizing grades of steel, possible alternates for the semithorough hardening steels of the 0.30 percent carbon class, possible substitutes for the thorough-hardening steels of 0.35 percent carbon and higher, and standard steels; and standard methods for sampling for check analyses, and standard variations from specified chemical limits.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.6; 1942. Selection and Conservation of Alloying Elements Used in Steels. Confined to the effect of carbon, manganese, phosphorus, sulphur, silicon, chromium, nickel, molybdenum, vanadium, and copper in certain ranges. Gives various tables to indicate whether the elements have a favorable or unfavorable effect, a weak or strong action, upon the properties of steel.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.7; 1942. The National Emergency Steels, NE 8000 Series. Covers the recovery of nickel from scrap, residual molybdenum, residual nickel, residual chromium, comparative physical properties of semithorough hardening grades, comparative physical property data of carburizing grades, hardenability, relationship between hardness and tensile strength, relationship between hardness and tempering temperature, relationship between Brinell hardness and tensile strength, and the standard end-quench hardenability test.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.8; 1942. Supplementary National Emergency Steels, NE 9400, 9500, and 9600 Series. Covers supplementary national emergency steels (compositions containing different amounts of manganese, silicon, and chromium; and manganese, silicon, nickel, chromium, and molybdenum), physical property data and standard end-quench hardenability data, limitations on alloying elements, standard end-quench hardenability curves, standard end-quench hardenability test, and standard methods for sampling for check analysis and standard variations from specified chemical limits.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.9; 1942. Report on Special Alloy Addition Agents. All the information pertains to special alloy addition agents which do not contain vanadium, and a large part of the available information consists of standard end-quench hardenability tests and mechanical property data on plain carbon and carbon-manganese steels. Covers grain size, hardenability, mechanical properties, general conclusions, summary, and tables showing results of tests.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.10; 1942. Mechanical Properties, NE 9400, 9500, and 9600 Series. The high nickel content of scrap has often prevented alloy steel producers from bringing heats of NE steels within the specified compositions, resulting in last minute switches of heats already in process to steels of higher specified nickel content, necessitating the use of greater quantities of virgin nickel and sometimes of chromium or molybdenum. Covers revised list of NE steels, giving chemical compositions and mechanical properties.

American Iron and Steel Institute. Manufacturers' Standard Practice. Supplementary Information. Alloy Steel, Section 10; 1942. National Emergency Steel Compositions. Gives compositions for five carbon-manganese steels, four manganese-molybdenum steels, thirteen nickel-chromium-molybdenum steels, three silicon-manganese and silicon-manganese-chromium steels, fourteen manganese-silicon-chromium-nickel-molybdenum steels, seven manganese-silicon-chromium steels, and three carbon-chromium steels.

American Iron and Steel Institute. Steel Products Manual, Section 1a; 1940. Ferroalloys. Defines ferroalloys and gives requirements for spiegeleisen, ferromanganese, ferrosilicon, silicomanganese, ferrochromium, high-nitrogen ferrochromium, ferrovanadium, ferrotungsten, zirconium alloys, ferrocolumbium, ferromolybdenum, ferrotitanium and ferrophosphorus. Sampling and analysis in accordance with A.S.T.M. procedures.

American Petroleum Institute, Div. of Production. Code 28; 1937. Code of Metallurgical Terms for Ferrous Alloys. Covers definitions of metallurgical terms arranged in alphabetical order.

American Society for Testing Materials, E 31-42; 1942. Methods of Chemical Analysis of Ferro-Alloys. For use in referee analysis. General instructions and precautions; and analysis for—ferrosilicon (silicon by fusion with sodium peroxide and dehydration with hydrochloric acid, total carbon by the direct-combustion method, phosphorus by the alkalimetric method, and sulphur by the nitric-hydrofluric acid-gravimetric method); ferromanganese, silico-mangenese, and manganese-silicon (manganese by bismuthate method, total carbon by the direct-combustion method, phosphorus by the perchloric acid-alkalimetric method, sulfur by the oxidation method, and silicon by the nitric-sulfuric acid method); ferrochromium (chromium by the sodium peroxide fusion method, total carbon by the direct-combustion method, and silicon by the sulfuric acid method); ferrovanadium (vanadium by the ammonium persulfate method, total carbon by the direct-combustion method, phosphorus by the cupferron-alkalimetric method, sulfur by the nitric acid-oxidation method, silicon by the nitric-sulfuric acid method, and ammonium by the cupferron-phosphate method); ferrotungsten and tungsten metal (tungsten by the acid digestion-cinchonine method, total carbon by the direct-combustion method, manganese by the persulfate-arsenite method, phosphorus by the tartrate-magnesia-alkalimetric method, sulfur by the nitric-hydrofluoric acid gravimeter method, silicon by the phosphoric-perchloric acid method, arsenic, copper, antimony, and tin); and ferromolybdenum (molybdenum by the permanganate titration method, total carbon by the direct-combustion method, sulfur by the nitric acid-gravimetric method, phosphorus by the alkalimetric method, silicon by the sulfuric acid method, and copper by the thiocyanate method).

American Society for Testing Materials, E 32-42; 1942. Methods of Sampling Ferro-Alloys. Includes procedures for sampling either before or after shipment from the plants of the manufacturers; description of apparatus for preparing samples; unit quantities for sampling and analysis; and methods of sampling—spiegeleisen and 15 percent ferrosilicon; ferrosilicon, standard ferromanganese, silicomanganese, ferrophosphorus, and 12 to 15 percent zirconium alloy; high carbon ferrochromium, medium-carbon ferromanganese, low-carbon ferromanganese, silicon metal, calcium-silicon, and 35 to 40 percent zirconium alloy; and ferrovanadium, ferromolybdenum, ferrotungsten, ferrocolumbium, low-carbon ferrotitanium, and ferrozirconium.

621.21 Ferrochrome

American Society for Testing Materials, A 101-42; 1942. Ferrochromium. Includes high-carbon and low-carbon grades; gives requirements as to chemical composition, sizes of materials, sampling, and inspection.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Ferrochromium (High Carbon), Sample 64. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Specification QQ-F-151a; 1941. Ferrochromium. Covers three grades—(A), (B) low carbon, and (C) high carbon. Gives detail requirements for form (lumps, crushed, or screened), and chemical composition; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

References.—Methods of sampling and testing and general requirements for metals, *see* 600.1, 621.20; pig iron, *see* 601.2.

621.22 Ferromanganese, Spiegeleisen

American Society for Testing Materials, A 98-41; 1941. Spiegeleisen. Cover three grades, furnished in pigs or lumps; requirements as to chemical composition, sampling, and inspection.

American Society for Testing Materials, A 99-39; 1939. Ferromanganese. Covers six grades of standard, medium-carbon, and low-carbon ferromanganese. Form as specified, chemical compositions, sampling, and inspection.

American Society for Testing Materials, A 181-42; 1942. A.S.M.E. Boiler Construction Code Specification SA-181. American Standards Assn., G46.1-1942. Forged or Rolled Steel Pipe Flanges for General Service. Covers flanges to be attached to piping or pressure vessels for two classes, for general service. Gives requirements as to grain flow, chemical composition, ladle analysis, tensile properties, test specimen, workmanship, finish, and inspection.

American Society for Testing Materials, A 242-42; 1942. Low-Alloy Structural Steel. Covers open-hearth or electric-furnace low-alloy structural steel suitable for welding or riveting, intended primarily for use as main stress-carrying material of structural members. Material not under 3/16 and not over 2 in. in thickness. Chemical composition, ladle and check analyses, tensile and bending properties, test specimens, number of tests, permissible variations in weight and thickness, marking, inspection, rejection, and rehearing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Ferromanganese. Covers definition, constants, solubility, derivation, specifications, containers, uses, and ordering instructions.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Spiegeleisen. Covers definition, constants, occurence, grades, shipping methods, and uses.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Spiegeleisen, Sample 66. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Ferromanganese Metal, Sample 68a. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Specification QQ-F-161a; 1941. Ferromanganese. Covers seven grades—A, B, C, D, E, F, and G. Gives requirements for form (pigs, lumps, crushed, or screened-to-size), and chemical composition; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification QQ-S-611a; 1941. Spiegeleisen. Covers three grades—A, B, and C. (Furnished in pigs, lumps, crushed, or screened-to-size.) Gives requirements for chemical composition;

methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Manganese Metal, Sample 67. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.20; pig iron, *see* 601.2; manganese ores, *see* 621.12.

621.23 Ferromolybdenum

American Society for Testing Materials, A 132-39; 1939. Ferromolybdenum. Covers two grades; requirements as to chemical composition, basis of purchase, sampling, and inspection.

U. S. Gov., Federal Specification QQ-F-171b; 1942. Ferromolybdenum. Covers two grades—A and B. Gives requirements for form (lumps, crushed, or screened-to-size), and chemical composition; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.20; pig iron, *see* 601.2.

621.24 Ferrosilicon

American Society for Testing Materials, A 100-39; 1939. Ferrosilicon. Includes seven grades of material, form as specified, chemical composition requirements, sampling, and inspection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Ferrosilicon. Covers definition, derivation, uses, grades, forms and packing, hazards, and substitutes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Ferrosilicon (75% Silicon), Sample 58; and Ferrosilicon (50% Silicon), Sample 59. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Federal Specification QQ-F-181a; 1941. Ferrosilicon. Covers eight grades—A, B, C-Special, C, D, E, F, and G. Gives requirements for form (lump or granular) and chemical composition; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.20; pig iron, *see* 601.2.

621.25 Ferrotungsten

American Society for Testing Materials, A 144-39; 1939. Ferrotungsten. Covers standard material crushed under 1 in. size; requirements as to chemical composition, sampling, and inspection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Tungsten and Ferrotungsten. Covers definition, constants, derivation, uses, impurities, and substitutes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Ferrotungsten, Sample 75. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.20; pig iron, *see* 601.2; tungsten powder, *see* 696.

621.26 Ferrotitanium, Ferrouranium, Ferrovanadium

American Society for Testing Materials, A 102-39; 1939. Ferrovanadium. Covers three grades crushed to specified size, chemical composition requirements, sampling, and inspection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Ferrovanadium. Covers definition, constants, occurrence, derivation, specifications, forms available, containers, shipping regulations, and uses.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Ferrotitanium (Low Carbon), Sample 116a. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Ferrovanadium (High Carbon), Sample 61a. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Specification QQ-F-191b; 1941. Ferrotitanium. Covers five grades—A, B, C, D, and E. Gives requirements for form (lumps, crushed, or screened-to-size), and chemical composition; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification QQ-F-201b; 1941. Ferrovanadium. Covers three grades—A, B, and C. Gives requirements for form (lumps, crushed, or screened-to-size), and chemical composition; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.20; pig iron, *see* 601.2.

621.27 Ferrophosphorus

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Ferrophosphorus, Sample 90. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.20; pig iron, *see* 601.2.

621.3 CRUDE AND SEMIFINISHED FERRO-ALLOYS

621.30 General Items

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.1; 1941. Possible Substitutes for Nickel Steels. Deals only with constructional steels containing chromium, nickel, molybdenum, manganese, silicon, and vanadium. Covers carburizing steels, thorough-hardening steels, low-carbon alloy steels, and standard methods for sampling for check analysis and standard variations from specified chemical limits.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.2; 1941. Direct Consumption of Aluminum in the Steel Industry. A study of the proper utilization and distribution of aluminum used in the steel industry for purposes of deoxidation and alloying. Covers effect of a decrease in aluminum on steel production, steps taken to decrease aluminum consumption, grades of aluminum, and suggested method of distributing aluminum.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.3; 1941. Problems Involved in the Conservation of Manganese. A plan for evaluating conservation efforts is suggested and individual products are discussed in accordance with that plan. Covers requirements for manganese, high manganese shell steel, commercially high-manganese steels, steel bars and forging billets, sheet and strip steel; wheels, axles, and heavy forgings; pipe, seamless tubing, carbon steel plates and structural shapes, steel piling, tin plate, rods and wire, standard tee rails, steel castings, and manganese-sulphur relationships.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.5; 1942. Possible Alternates for Nickel, Chromium, and Chromium-Nickel Constructional Alloy Steels. Covers possible alternates for chromium and nickel constructional alloy steels, possible alternates for the standard carburizing grades of steel, possible alternates for the semithorough hardening steels of the 0.30 percent carbon class, possible substitutes for the thorough-hardening steels of 0.35 percent carbon and higher, and standard steels; and standard methods for sampling for check analyses, and standard variations from specified chemical limits.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.6; 1942. Selection and Conservation of Alloying Elements Used in Steels. Confined to the effect of carbon, manganese, phosphorus, sulphur, silicon, chromium, nickel, molybdenum, vanadium, and copper in certain ranges. Gives various tables to indicate whether the elements have a favorable or unfavorable effect, a weak or strong action, upon the properties of steel.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.7; 1942. The National Emergency Steels, NE 8000 Series. Covers the recovery of nickel from scrap, residual molybdenum, residual nickel, residual chromium, comparative physical properties of semithorough hardening grades, comparative physical property data of carburizing grades, hardenability, relationship between hardness and tensile strength, relationship between hardness and tempering temperature, relationship between Brinell hardness and tensile strength, and the standard end-quench hardenability test.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.8; 1942. Supplementary National Emergency Steels, NE 9400, 9500, and 9600 Series. Covers supplementary national emergency steels (compositions containing different amounts of manganese, silicon, and chromium; and manganese, silicon, nickel, chromium, and molybdenum), physical property data and standard end-quench hardenability data, limitations on alloying elements, standard end-quench hardenability curves, standard end-quench hardenability test, and standard methods for sampling for check analysis and standard variations from specified chemical limits.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.9; 1942. Report on Special Alloy Addition Agents. All the information pertains to special alloy addition agents which do not contain vanadium, and a large part of the available information consists of standard end-quench hardenability tests and mechanical property data on plain carbon and carbon-manganese steels. Covers grain size, hardenability, mechanical properties, general conclusions, summary, and tables showing results of tests.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.10; 1942. Mechanical Properties, NE 9400, 9500, and 9600 Series. The high nickel content of scrap has often prevented alloy steel producers from bringing heats of NE steels within the specified compositions, resulting in last minute switches of heats already in process to steels of higher specified nickel content, necessitating the use of greater quantities of virgin nickel and sometimes of chromium or molybdenum. Covers revised list of NE steels, giving chemical compositions and mechanical properties.

American Iron and Steel Institute. Steel Products Manual, 1943. Stainless Steel. Covers standard type numbers and composition ranges of components corresponding thereto.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1940. Alloy Steels. Covers unit stresses, thickness of material, sizes of rivets, lacing, rivets, alloy and structural steels combined, secondary stresses, holes, sheared and flame-cut edges, and welding.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Steels, National Emergency. Covers definition, characteristics, types and specifications, marketing, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944 Steel; Stainless. Covers definition, derivation, properties, constants and grades, uses, forms, marketing, and substitutes.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Steels. The steel compositions included in this standard are considered adequate for practically all parts made of ferrous materials that are necessary for the production of automotive apparatus and include grades that have been found commercially available and technically adequate for the service required of such parts. Includes general instructions, explanation of S.A.E. numbering system, chemical compositions, methods of sampling for check analysis, method of determining hardenability, grain size charts for classification of steel, magnaflux testing, determination of inclusions, general characteristics and heat treatments, tension test specimens, physical properties, hardness tests, and definition of heat-treating terms.

621.31 Ferro-Alloy Billets, Bars, and Rods (Alloy-Steel)

American Iron and Steel Institute. Steel Products Manual, Section 10; 1943. Relates only to alloy steel blooms, billets, slabs, bars, and bar strip. Covers general definitions, standard alloy steels including chemical limits and ranges for nonstandard open-hearth alloy steels and electric furnace carbon and alloy steels, and manufacturing practices.

American Society for Testing Materials, A 274-44 T. Tentative Specification for Alloy-Steel Blooms, Billets, and Slabs for Forgings. Covers scope, process, discard, reduction from ingot, chemical composition, ladle analysis, check analysis, finish and soundness, conditioning, permissible variations in weight, marking, inspection, rejection, and rehearing. A.S.T.M. Emergency Alternate Provision EA-A 274; 1944, affected section 5, Chemical Composition.

American Society for Testing Materials, A 276-44 T. Tentative Specification for Hot-Rolled and Cold-Finished Corrosion-Resisting Steel Bars. Gives scope, basis of purchase, conditions, chemical composition, chemical analysis, physical properties, test specimens, number of tests, permissible variations in dimensions, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 5022A; 1942. Steel; Free-Cutting Manganese (1.3 Manganese). Gives requirements for form (bars, billets, tubes, or forgings), composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5024A; 1942. Steel; Free-Cutting Manganese (1.5 Manganese). Gives requirements for form (bars, billets, tubing, or forgings), composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.5025; 1942. Steel, Free-Cutting Manganese (Heat Treated). Covers requirements for form (bars, billets, forgings, or as ordered), composition, condition, quality, tolerances, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5610B; 1944. Steel; Corrosion-Resistant, 13 Chromium (Free Machining) For bars, billets, forgings, or as ordered. Covers composition, condition, hardenability, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5615A; 1942. Steel; Corrosion-Resistant, 13 Chromium, 1.5 Nickel. Gives requirements for form (bars, billets, forgings, or as ordered), composition, condition, hardenability, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5630A; 1942. Steel; Corrosion-Resistant, 17 Chromium (High-Carbon). Gives requirements for form (bars, billets, forgings, or as ordered), composition, condition, hardenability, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.5632; 1942. Steel; Corrosion-Resistant, 17 Chromium, .5 Molybdenum (High-Carbon) (Free Machining). Covers requirements for form (bars, billets, forgings, or as ordered), composition, condition, hardenability, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5640A; 1942. Steel; Corrosion-Resistant, 18 Chromium, 8 Nickel (Free Machining). For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.5641; 1942. Steel; Corrosion-Resistant, 18 Chromium, 8 Nickel (Swaging or Hot-Upsetting Type). For bars, billets, forgings, or as ordered. Covers requirements for composition, condition, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5645B; 1942. Steel; Corrosion and Heat-Resistant, 18 Chromium, 8 Nickel. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, embrittlement, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.5700; 1940. Steel; Valve (Chromium-Nickel-Tungsten). For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 5705; 1942. Steel; Valve, Chromium-Nickel Silicon. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification No.5710; 1942. Steel; Valve, Chromium-Silicon Nickel. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6240B; 1942. Steel; Carburizing (5 Percent Nickel). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, reports, shipments, identification, and rejections. Similar Specification: Army 57-107-18.

Society of Automotive Engineers. Aeronautical Material Specification 6242B; 1942. Steel; Carburizing (5 Percent Nickel). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6250C; 1942. Steel; Carburizing, Nickel-Chromium (Light Section). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6252C; 1942. Steel; Carburizing, Nickel-Chromium (Heavy Section). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6253D; 1944. Steel; Carburizing, Nickel-Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6254C; 1942. Steel; Carburizing, Nickel-Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6260A; 1944. Steel; 3 Ni, 1 Cr, .1 Mo (.08-.13 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6262A; 1944. Steel; 3 Ni, 1 Cr, .1 Mo (.08-.13 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6263A; 1944. Steel; 3 Ni, 1 Cr, .1 Mo (.09-.14 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6264A; 1944. Steel; 3 Ni, 1 Cr. .1 Mo (.15-.20 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6270B; 1944. Steel; Carburizing, 5 Ni, .5 Cr, .2 Mo (.12-.17C). For bars, billets, forgings, or as ordered. Gives requirements for chemical composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6272B; 1944. Steel; Carburizing, .5 Ni, .5 Cr, .2 Mo (.15-.20C). For bars, billets, forgings, or as ordered. Gives requirements for chemical composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6274B; 1944. Steel; Carburizing, .5 Ni, .5 Cr, .2 Mo (.17-.22C). For bars, billets, forgings, or as ordered. Gives requirements for chemical composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6280A; 1943. Steel; .55 Ni, .5 Cr, .2 Mo (.27-.33 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6290C; 1944. Steel; Carburizing, 1.8 Ni, .25 Mo (.11-.17C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6292C; 1944. Steel; Carburizing, 1.8 Ni, .25 Mo (.15-.20C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6294C; 1944. Steel; Carburizing, 1.8 Ni, .25 Mo (.17-.22C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 6300; 1943. Steel; .25 Mo. (.35-.40 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specifications 6310A, 6315A, and 6317A; 1942. Steel; Nickel Molybdenum. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6312A; 1942. Steel; Nickel Molybdenum. For bars, billets, forgings, tubing, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6320A; 1943. Steel; .55 Ni, .5 Cr, .25 Mo (.33-.38 C). For bars, billets, forgings, or as ordered. Chemical composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6322A; 1943. Steel; .55 Ni, .5 Cr, .25 Mo (.38-.43 C). For bars, billets, forgings, or as ordered. Chemical composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6325A; 1943. Steel; .55 Ni, .5 Cr, .25 Mo (.38-.43 C) (105,000 TS). For bars, billets, castings, or as ordered. Chemical composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6327A; 1943. Steel; .55 Ni, .5 Cr, .25 Mo (.38-.43 C) (125,000 TS). For bars, billets, forgings, or as ordered. Chemical composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6330A; 1942. Steel; Nickel Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specifications 6332 and 6335, 1939; and 6337, 1940. Steel; Nickel Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerance, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 6342; 1944. Steel; 1 Ni, .8 Cr, .25 Mo (.38-.43 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections. Similar specification, NE 9840.

Society of Automotive Engineers. Aeronautical Material Specification 6370A; 1942. Steel; Chromium-Molybdenum (.27-.33 Carbon). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerance, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6380A; 1942. Steel; Chromium-Molybdenum (.35-.43 Carbon). For bars, billets, forgings, or as ordered. Covers requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6382A; 1942. Steel; Chromium-Molybdenum (.38-.43 Carbon). For bars, billets, forgings, or as ordered. Covers requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6412A; 1942. Steel; Nickel-Chromium-Molybdenum. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6415A; 1942. Steel; Nickel-Chromium-Molybdenum. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6440A; 1943. Steel; Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6448A; 1944. Steel; Chromium Vanadium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections. Similar specifications, Army-Navy Aeronautical AN-QQ-S-687 and SAE 6150.

Society of Automotive Engineers. Aeronautical Material Specification 6470A; 1942. Steel; Nitriding (Chromium-Molybdenum-Aluminum). Gives requirements for form (bars, billets, forgings), composition, condition, nitriding, quality, reports, shipments, identification, and rejections.

U. S. Gov., Army Air Forces. Specification 10080-A-1; 1941. Bar; Steel, Low Carbon, High Chromium.

U. S. Gov., Army Air Forces. Specification 10240; 1940. Steel; Carburizing, Bars, Rods and Billets, Nickel-Molybdenum (4615).

U. S. Gov., Army Air Forces. Specification 10243; 1942. Steel; Chromium, High Carbon (52100), Bars.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-9a; 1944. Steel; Molybdenum (4037), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-13a; 1943. Steel; Chrome-Nickel-Molybdenum (8620), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-14a; 1943. Steel; Chrome-Nickel-Molybdenum (8630), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-15a; 1943. Steel; Chrome-Nickel-Molybdenum (8735), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-16a; 1943. Steel; Chrome-Nickel-Molybdenum (8740), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-19a; 1944. Steel; Chrome-Molybdenum-Aluminum, Bar and Rod (for Nitriding).

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-684a; 1943. Steel; Chrome-Molybdenum (41301), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-687-2; 1942. Steel; Chrome-Vanadium (6150), Bar and Billet.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-688a; 1944. Steel; Chrome-Vanadium (6195), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-689a; 1944. Steel; Nickel (2330), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-690-1; 1942. Steel; Nickel-Chromium (3140), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-752a; 1943. Steel; Chrome-Molybdenum (4140), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-756a; 1943. Steel; Chrome-Nickel-Molybdenum (4340), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-770a; 1944. Steel; Corrosion-Resisting (16 Cr, 2 Ni), Bar and Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-771-4; 1943. Steel; Corrosion-Resisting (18 Cr, 8 Ni), Bars and Rods.

U. S. Gov., Federal Specification QQ-S-671; 1941. Amendment 1; 1942. Steel; Carbon and Alloy, Bars. Covers four manganese steels, five nickel steels, fifteen nickel-chromium steels, ten molybdenum steels, four chromium steels, two chromium vanadium steels, and two silicon manganese steels; in seven conditions—as rolled (hot-rolled or forged), annealed, normalized, normalized and tempered, quenched and tempered, cold-rolled or cold-drawn, and cold-rolled or cold-drawn and stress relief annealed. Gives requirements for material, manufacture, quality and condition, condition and finish, heat treatment, chemical composition, physical properties, dimensions, and tolerances; methods of inspection and tests; requirements for packing and marking for shipment; tables of chemical requirements; and tables of permissible variations in squares, rounds, hexagons, and flats.

U. S. Gov., Federal Specification QQ-S-763a; 1943. Steel; Corrosion-Resisting, Bars and Forgings (Except for Reforging). Covers ten classes and six grades and shall be made by the open-hearth or the electric furnace process unless otherwise specified. Gives chemical requirements and physical properties; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-S-43; 1944. Steel Bars for Projectile Stock.

U. S. Gov., Navy Dept. Specification 46N4b; 1943. Nickel-Chromium Alloy; Rods, for Boiler Refractory Anchor Bolts.

U. S. Gov., Navy Dept. Specification 46S25; 1931. Steel; Chrome-Vanadium, Medium Carbon, Bars and Billets (Aircraft Use).

U. S. Gov., Navy Dept. Specification 46S31; 1935. Steel; Chrome-Vanadium and Silicon-Chromium, Rod, for Helical Springs (Aircraft Use).

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for carbon and alloy-steel nuts for bolts used in high-temperature service up to 1,000° F.—process, fabrication, stress relieving, chemical composition, tests, and finish.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings. flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for three grades of rivet steel—(A) and (B) low carbon, and (C) chrome-manganese-silicon alloy-steel—and requirements for rivets; chemical composition, tensile and bending properties, test specimens, tests of finished rivets, permissible variations in diameter, workmanship, and finish.

U. S. Gov., Treasury Dept., Procurement Div., No. 296; 1938. Steel; Alloy, Bars, Billets (for Reforging, or Other Operations Before Heat Treatment). Covers nickel steel, nickel chromium steel, chromium molybdenum steel, and chromium vanadium steel. Gives requirements for chemical composition, manufacturer's analysis, bars, and billets; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-107-13; 1927. Steel Bars; Medium Carbon, High Chromium, 51235.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-107-18A; 1940. Steel; Carburized, Bar, Rod, and Billet.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-107-22A; 1940. Steel; Carburized, Bars, Rods, and Billets, Nickel-Chromium (3312).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-107-8B; 1940. Steel Rod; Tungsten-Chromium, for Armor-Piercing Bullet Cores, W.D. 74100.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-107-25A; 1944. Steel; Bars and Blanks (for Small Arms Gun Barrels).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-107-28B; 1943. Steel; Nitriding, Chrome-Molybdenum, Aluminum, Bars.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-114-1A; 1942. Steel; Plain Carbon and Low-Alloy High-Tensile, Plate, Shape, Sheet, Strip and Rectangular Bars, for Welded Structures.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-116; 1939. Chromium Alloy; Bar, Heat-Resisting.

References.—Tolerances on weight and sizes, *see* 600.7; methods of testing, general requirements for metals, *see* 600.1, 621.30; heat treatments, *see* 600.5; carbon steel billets, *see* 602.2; carbon steel bars and rods, *see* 603.2, 603.3, 605.1; alloy steel structural bars, spring stock, tool stock, *see* 621.33, 621.34, 621.35; alloy steel bolting material, *see* 622.1.

621.32 Ferro-Alloy Plates, Sheets, and Strips

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1938. Structural Nickel Steel. Gives process, discard, chemical composition, ladle analyses, check analyses, physical properties, tests of eye-bars, modification in elongation, yield point, speed of testing machine, character of fracture, bend tests, drift tests, test specimens, number of tests, retests, finish, permissible variations in weight and thickness, identification marks, inspection, and rejection. Chemical and physical requirements are identical with, and other requirements are similar to, A.S.T.M. A8.

American Society for Testing Materials, A 8-39; 1939. American Assn. of State Highway Officials, M 96-39. Structural Nickel Steel. For high-strength structural nickel steel plates, shapes, and bars up to 1 1/4 in. in thickness, and eyebars up to 2 in. in thickness; for use as main stress-carrying structural members. Requirements as to chemical composition, ladle analysis, tensile properties, elongation, bending, test specimen, permissible variations in weight and thickness, finish, and inspection.

American Society for Testing Materials, A 167-44; 1944. Corrosion-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip. Covers ten grades. Gives requirements for process, chemical composition, analysis, physical properties, bending properties, test specimens, testing, finishes, permissible variations in dimensions and weights, workmanship and finish, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 167a; 1944, affected table I, Chemical Requirements.

American Society for Testing Materials, A 176-44; 1944. Corrosion-Resisting Chromium Steel Plate, Sheet, and Strip. Covers five grades. Gives requirements for process, chemical composition, analysis, physical properties, bending properties, test specimens, testing, finishes, permissible variations in dimensions and weight, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, A 177-44; 1944. High-Strength Corrosion-Resisting Chromium-Nickel Steel Sheet and Strip. Gives requirements for process, chemical composition, analysis, temper, tensile properties, bending properties, test specimens, tests, permissible variations in thickness, camber, flatness, permissible variations in width, other permissible variations, workmanship and finish, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 177; 1944, affected section 4, Chemical Composition.

American Society for Testing Materials, A 202-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-202. American Standards Assn., G32.1-1944. Chrome-Manganese-Silicon (CMS) Alloy-Steel Plates for Boilers and Other Pressure Vessels. For two ranges of high tensile strength plates, for maximum workability, and for use without heating. Gives requirements for chemical composition, ladle analysis, check analysis, physical and bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, marking, inspection, and rejection.

American Society for Testing Materials; A 203-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-203. American Standards Assn., G33.1-1944. Low-Carbon Nickel-Steel Plates for Boilers and Other Pressure Vessels. For three tensile strength ranges of plates not over 2 in. in thickness, of flange and ordinary firebox qualities, for use in locomotive boiler shells, boilers for stationary service, and other pressure vessels. Gives chemical composition, ladle analysis, check analysis, physical properties, bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 204-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-204. American Standards Assn., G34.1-1944. Molybdenum-Steel Plates for Boilers and Other Pressure Vessels. For three high tensile strength ranges for fusion welding, for use in locomotive boiler shells, stationary boilers, and other pressure vessels. Gives maximum thickness for various grades, heat treatment, chemical composition, ladle analysis, check analysis, physical properties, bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 225-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-225. Manganese-Vanadium Steel Plates for Boilers and Other Pressure Vessels. Covers two grades of plates in high tensile strength ranges primarily for fusion welding, for use in locomotive boiler shells, boilers for stationary service, and other pressure vessels. Gives heat treatment, chemical composition, ladle analysis; check analysis, tensile and bending properties, homogeneity test, test specimens, number of tests, permissible variations in thickness and weight, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 240-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-240. Corrosion-Resisting Chromium and Chromium-Nickel Steel Plate, Sheet, and Strip for Fusion-Welded Unfired Pressure Vessels. Covers seven grades. Gives requirements for process, heat treatment, chemical composition, analysis, physical properties, bending properties, test specimens, testing, finishes, permissible variations in dimensions and weight, workmanship and finish, marking, inspection, and rejection.

American Society for Testing Materials, A 263-44T; 1944. A.S.M.E. Boiler Construction Code Specification SA-263. Tentative Specifications for Corrosion-Resisting Chromium Steel Clad Plate, Sheet, and Strip. For carbon steel or low-alloy steel base to which is integrally and continously bonded on one or both sides a layer of corrosion-resisting chromium steel. Gives requirements for process, heat treatment, thickness of cladding metal, chemical composition, check analysis, physical properties, test specimens, number of tests, permissible variations in thickness and weight, finish, repair of minor defects, marking, inspection, and rejection.

American Society for Testing Materials, A 264-44T; 1944. A.S.M.E. Boiler Construction Code Specification SA-264. Tentative Specifications for Corrosion-Resisting Chromium-Nickel Steel Clad Plate, Sheet, and Strip. For carbon steel or low-alloy steel base to which is integrally and continuously bonded on one or both sides a layer of corrosion-resisting chromium-nickel steel. Gives requirements for process, heat treatment, thickness of cladding metal, chemical composition, check analysis, physical properties, test specimens, number of tests, permissible variations in thickness and weight, finish, repair of minor defects, marking, inspection, and rejection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. High Chrome Steel Tank Plates for Nitric Acid Tank Cars, M-153-29; 1929. Gives requirements for the use of electric furnace steel, composition, analysis, physical tests, permissible variation in thickness, method of pickling plates, finish, and marking.

Society of Automotive Engineers. Aeronautical Material Specification 5510B; 1942. Steel Sheet and Strip; Corrosion-Resistant (18 Chromium, 8 Nickel). Gives requirements for composition, condition, quality, embrittlement, tolerance, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5515A; 1942. Steel Sheet and Strip; Corrosion-Resistant (Deep and Shallow Forming Quality, 18 Chromium, 8 Nickel). Covers requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5516A; 1942. Steel Sheet and Strip; Corrosion-Resistant (18 Chromium, 8 Nickel) (Cold-Rolled). Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5517A; 1942. Steel Sheet and Strip; Corrosion-Resistant (Cold-Rolled, High Ductility Type, 18 Chromium, 8 Nickel, 125,000 T.S.). Covers requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5518A; 1942. Steel Sheet and Strip; Corrosion-Resistant (Cold-Rolled, High Ductility Type, 18 Chromium, 8 Nickel, 150,000 T.S.). Covers requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5519B; 1942. Steel Sheet and Strip; Corrosion-Resistant (Cold-Rolled, High Ductility Type, 18 Chromium, 8 Nickel, 185,000 T.S.). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 6350; 1942. Steel Plate, Sheet, and Strip, Chromium-Molybdenum (.27-.33 Carbon). Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6352A; 1942. Steel Plate, Sheet, and Strip, Chromium-Molybdenum (.32-.39 Carbon). Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 6353; 1943. Steel Plate, Sheet, and Strip, Chromium Molybdenum (.35-.42 Carbon). Chemical composition, grain size, hardenability, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6355A; 1943. Steel Plate, Sheet, and Strip, .55 Ni, .5 Cr, .2 Mo, (.27-.33 C). Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6357A; 1943. Steel Plate, Sheet, and Strip, .55 Ni, .5 Cr, .25 Mo, (.33-.38 C). Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 6358; 1943. Steel Plate, Sheet, and Strip, .55 Ni, .5 Cr, .25 Mo (.38-.43 C). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 6359; 1942. Steel Plate, Sheet, and Strip, Nickel-Chromium-Molybdenum. Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6455A; 1942. Steel Sheet (Spring) (Chromium Vanadium). For cold-finished sheet or strip. Gives requirements for composition, grain size, condition, quality, tolerance, reports, identification, and rejections.

U. S. Gov., Army Air Forces. Specification 10237; 1936. Steel; Corrosion-Resistant, Corrugated Sheet.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-12-2; 1943. Steel; Chrome-Nickel-Molybdenum (8630), Sheet and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-22-1; 1943. Steel; Sheet-and-Strip (.33 to .38 Carbon) Chrome-Nickel-Molybdenum.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-685-4; 1943. Steel; Chrome-Molybdenum (4130), Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-686-1; 1942. Steel; Chrome-Molybdenum (X4135), Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-757-3; 1943. Steel; Corrosion and Heat-Resisting (18 Cr, 8 Ni), Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-772a; 1943. Steel; Corrosion-Resisting (18 Cr, 8 Ni), Plate, Sheet, and Strip.

U. S. Gov., Federal Specification QQ-S-766a; 1943. Steel; Corrosion-Resisting, Plates, Sheets, Strips, and Structural Shapes. Covers six classes; made by the open-hearth or the electric-furnace process and cast in metal molds. Gives requirements for chemical composition, physical properties, permissible variations, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 47S20a; 1937. Steel; Corrosion-Resisting, Plates, Sheets, Strips, and Structural Shapes.

U. S. Gov., Navy Dept. Specification 48S6c; 1935. Steel; Nickel, Plate.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-136-7; 1927. Steel; Alloy, Sheet or Strip, W.D. 6130.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-114-1A; 1942. Steel; Plain Carbon and Low-Alloy High-Tensile, Plate Shape, Sheet, Strip, and Rectangular Bars, for Welded Structures.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-136-8-C; 1933. Steel; Chrome-Molybdenum, Sheet or Strip, X-4130.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-136B; 1941. Steel; Sheet and Strip, Carbon and Alloy.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; heat treatments, *see* 600.5; standard thicknesses, *see* 604.0; carbon steel sheets and plates, *see* 604, 605.1; alloy steel structural plates, *see* 621.33.

621.33 Structural Shapes of Ferro-Alloys

American Institute of Steel Construction. Applications of Structural Steels and Lightweight Alloys for Bridges, Buildings, and Similar Structures, 1943. Gives requirements for physical and mechanical properties, fabrication and usability characteristics, forming and bending, riveting, welding, corrosion, aluminum, magnesium, stainless steel, low-alloy structural steel, sheet steel for structural purposes, standard structural carbon steel, and general conclusion.

American Iron and Steel Institute. National Emergency Specifications, 1943. Simplification of Structural Steel Shapes. The simplified list of structural steel shapes given herein is that referred to in paragraph (b) of schedule 4 to Limitation Order L-211 of the War Production Board. Gives nominal dimensions and weight per foot of beams, columns, channels, angles, zees, tees, and miscellaneous shapes.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Steel Railway Bridges (for Fixed Spans Not Exceeding 400 Feet in Length). Covers requirements for alloy steels. Covers unit stresses, thickness of material, sizes of rivets, lacing, alloy and structural steels combined, secondary stresses, and workmanship.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1938. Structural Nickel Steel. Gives process, discard, chemical composition, ladle analyses, check analyses, physical properties, tests of eye-bars, modification in elongation, yield point, speed of testing machine, character of fracture, bend tests, drift tests, test specimens, number of tests, retests, finish, permissible variations in weight and thickness, identification marks, inspection, and rejection. Chemical and physical requirements are identical with, and other requirements are similar to, A.S.T.M. A8.

American Society for Testing Materials, A 8-39; 1939. American Assn. of State Highway Officials, M 96-39. Structural Nickel Steel. For high-strength structural nickel steel plates, shapes, and bars up to 1 1/4 in. in thickness, and eyebars up to 2 in. in thickness; for use as main stress-carrying structural members. Requirements as to chemical composition, ladle analysis, tensile properties, elongation, bending, test specimen, permissible variations in weight and thickness, finish, and inspection.

American Society for Testing Materials, A 148-44; 1944. American Standards Assn., G52.1-1944. Alloy-Steel Castings for Structural Purposes. For use where mechanical stresses unaccompanied by high temperatures predominate, including full annealed, normalized and tempered, and liquid quenched and tempered or drawn castings. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, magnetic particle testing, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 148a; 1944, affected section 1, a fourth grade added under class C.

U. S. Gov., Federal Specification QQ-S-766a; 1943. Steel; Corrosion-Resisting, Plates, Sheets, Strips, and Structural Shapes. Covers six classes; made by the open-hearth or the electric-furnace process and cast in metal molds. Gives requirements for chemical composition, physical properties, permissible variations, and tolerances; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-114-1A; 1942. Steel; Plain Carbon and Low-Alloy, High-Tensile, Plate Shape, Sheet, Strip, and Rectangular Bars, for Welded Structures.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; standard thicknesses of plates, *see* 604.0; tolerances on weight and thickness, *see* 600.7; carbon structural steel, *see* 605.1.

621.34 Alloy Steel for Springs

American Society for Testing Materials, A 59-39; 1939. Silicon-Manganese Steel Bars for Springs. Requirements for chemical composition of hot-rolled bars, ladle analysis, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, A 60-42; 1942. Chromium-Vanadium Steel Bars for Springs. Requirements for hot-rolled bars, chemical composition, ladle analysis, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, A 231-41; 1941. Chromium-Vanadium Steel Spring Wire. Covers untempered steel wire for use in springs at moderately elevated temperatures. Requirements as to chemical composition, ladle analysis, permissible variations in dimensions, surface condition, and inspection.

American Society for Testing Materials, A 232-41; 1941. Chromium-Vanadium Steel Valve Spring Quality Wire. For highest quality chromium-vanadium valve spring wire requiring high-fatigue properties, especially at moderately elevated temperatures. Chemical composition, ladle analysis, physical requirements, permissible variations in dimensions, decarburization, surface condition, and inspection.

Society of Automotive Engineers. Aeronautical Material Specification 5688A; 1942. Steel Wire; Corrosion-Resistant, 18 Chromium, 8 Nickel (Spring). Gives requirements for composition, condition, quality, tolerances, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 6450; 1941. Spring Wire; Chromium-Vanadium. For cold-finished round wire and other shapes. Gives requirements for composition, grain size, condition, quality, tolerance, finished parts, identification, reports, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6455A; 1942. Steel Sheet (Spring) (Chromium Vanadium). For cold-finished sheet or strip. Gives requirements for composition, grain size, condition, quality, tolerance, reports, identification, and rejections.

U. S. Gov., Navy Dept. Specification 46S31; 1935. Steel; Chrome-Vanadium and Silicon-Chromium, Rod, for Helical Springs (Aircraft Use).

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; heat treatments, *see* 600.5; tolerances on weight and thickness, *see* 600.7; carbon spring steel, *see* 603.33.

621.35 Alloy Steel for Tools

U. S. Gov., Treasury Dept., Procurement Div., No. 295; 1938. Steel; Tool, High-Speed and Carbon. Covers two classes of tungsten and five classes of carbon steel. Gives requirements for material, workmanship, process, imperfections, lengths, tolerances, chemical requirements, and intended uses of each class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-108A; 1943. Steel; Tool, Carbon, Alloy, and High Speed.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; heat treatments, *see* 600.5; tolerances on weight and thickness, *see* 600.7; carbon tool steel, *see* 603.32.

621.36 Alloy Steel for Magnets

American Society for Testing Materials, A 34-44; 1944. Methods of Test for Magnetic Properties of Iron and Steel. Includes procedures for determining the normal induction and hysteresis, core loss, normal and incremental permeability and core loss, permeability of feebly magnetic materials, interlamination resistance, and lamination factor.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-120A; 1942. Alloy; Permanent Magnet.

References.—Methods of test for magnetic properties, *see* 600.1.

621.37 Alloy Steel for Tubes

621.39 Miscellaneous Ferro-Alloys

American Society for Testing Materials, ES-5a; 1942. Emergency Specifications for Carbon-Chromium, Ball and Roller-Bearing Steels. Covers three types of high-carbon-chromium steel bars, rods, wire, and tubes for ball and roller bearings. Requirements for process of manufacture, chemical analyses, usage, analysis, check analysis, workmanship, and tolerances.

U. S. Gov., Navy Dept. Specification 46S12d; 1938. Steel; Corrosion-Resisting, for Turbine Parts.

U. S. Gov., Navy Dept. Specification 46S33; 1939. Steel; Alloy, Molybdenum, Castings.

U. S. Gov., Navy Dept. Specification 46S34b; 1945. Steel; Alloy, Molybdenum Wrought.

622. MANUFACTURES OF FERRO-ALLOYS

622.1 BOLTS, FERRO-ALLOY

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 53, 54, 55, 56, 57, 58, 59, 60, 62, 64, and 66; 1944. Bolt; Close Tolerance, Alloy Steel, and Aluminum Alloy. Nos. 10-32, 1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, 9/16-18, 5/8-18, 3/4-16, 7/8-14, and 1-14. Gives drawings with dimensions and notes for size. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 80, 81, 82, 83, 84, 85, and 86; 1944. Bolt; 100° Flush Head Close Tolerance. Gives drawings, dimensions and notes for Nos. 1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, 9/16-18, and 5/8-18. Developed by National Aircraft Standard Committee.

American Society for Testing Materials, A 96-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-96. American Standards Assn., G17.2-1944. Alloy-Steel Bolting Material for High-Temperature Service. Covers rolled, forged, or cold-drawn bars, and bolts, screws, and studs. Gives requirements for heat treatment, chemical composition, ladle analysis, check analysis, tensile properties, hardness test, test specimens, number of tests, retests, finish, nuts and washers, threads, marking, inspection, and rejection.

American Society for Testing Materials, A 183-40T; 1940. Tentative Specifications for Heat-Treated Carbon- and Alloy-Steel Track Bolts and Nuts. For two grades of carbon-steel track bolts, alloy-steel track bolts, and nuts; requirements as to chemical compositions, tensile and bending properties, test specimen, strip test, permissible variations in dimensions, threads and thread fit. A.S.T.M. Emergency Alternate Provision EA-A 183; 1942, affected section 1, Scope; section 3, Chemical Composition; section 4, Ladle Analysis; section 6, Tensile Properties; section 8, Bending Properties; and section 14, Threads and Thread Fit.

American Society for Testing Materials, A 193-44T; 1944. Tentative Specifications for Alloy-Steel Bolting Materials for High-Temperature Service From 750 to 1,000° F. Metal Temperatures. For bolting material for pressure vessels, valves, flanges, and fittings, including rolled, forged, or cold-drawn bars; and bolts, screws, and studs. Includes 10 ferritic and 1 austenitic steel. Gives requirements for heat treatment, chemical composition, analyses, tensile properties, test specimens, number of tests, retests, finish, nuts and washers, threads, marking, inspection, and rejection.

American Society for Testing Materials, A 194-40; 1940. A.S.M.E. Boiler Construction Code Specification SA-194. American Standards Assn., G38.1-1942. Carbon and Alloy-Steel Nuts for Bolts for High-Pressure and High-Temperature Service to 1,100° F. Covers five classes of material based on severity of service. Method of fabrication, stress relief, chemical compositions, hardness, drift, and stripping tests, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-A194; 1942, affected section 1, Scope.

American Transit Assn. Standard Specification for Quenched, Alloy-Steel Track Bolts, W22-37; 1937. Gives detailed requirements as to method of manufacture, chemical and physical properties and tests, permissible variations, workmanship and finish, marking, and inspection and rejection.

Hydraulic Institute. Material Specification for Heavy Duty Bolting Materials and Nuts, No. 520; 1939. These specifications cover an alloy steel bolting material and a carbon steel nut material for service where the metal temperature does not exceed 900° F. Includes rolled, forged, or cold-drawn bar bolts, screws, and studs; requirements for manufacture, chemical composition, physical properties, finish, and thread standards.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-3a; 1943. Bolts; Aircraft.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; heat treatment, *see* 600.5; tolerances on weight and thickness, *see* 600.7; classification of railway materials, *see* 600.2; carbon steel bolts, track bolts, *see* 608.31, 606.4.

622.2 RAILWAY RAILS, FERRO-ALLOY

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; classification of railway materials, *see* 600.2; track construction, *see* 606.0; carbon steel rails, *see* 606.1.

622.3 TUBULAR PRODUCTS AND FITTINGS, FERRO-ALLOY

American Iron and Steel Institute. Steel Products Manual, 1942. Specification P-452-T. Seamless and Welded Seamless Steel Tubing for the Dairy and Food Industry. Covers a grade of seamless and welded austenitic stainless steel tubing in sizes up to and including 3 in. OD intended for use in the dairy and food industry where severe corrosive conditions exist. Includes requirements for process, manufacture, chemical composition, check analysis, hydrostatic test, tolerances, finish, marking, packaging, inspection, certification, rejection, and rehearing.

American Iron and Steel Institute. Steel Products Manual, 1942. Specification P-518-T. Seamless and Welded Ferritic Type Stainless Steel Tubing for General Service. Covers five grades of stainless steel tubing for general corrosive and high temperature service. Includes requirements for process, manufacture, chemical composition, check analysis, tensile properties, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, tolerances, finish, marking, inspection, rejection, and rehearing.

American Iron and Steel Institute. Steel Products Manual, 1942. Specification P-524-T. Seamless and Welded Austenitic Type Stainless Steel Tubing for General Service. Covers five grades of stainless steel tubing for general corrosive and high temperature service. Includes requirements for process, manufacture, chemical composition, check analysis, flaring test, hydrostatic test, test specimens, number of tests, retests, retreatment, tolerances, finish, marking, inspection, rejection, and rehearing.

American Iron and Steel Institute. Steel Products Manual, 1942. Specification P-525-T. Seamless Chromium-Nickel Austenitic Alloy Steel Still Tubes for Refinery Service. Covers three grades of seamless austenitic chromium-nickel alloy steel still tubes from 2 in. to 7 1/2 in. in outside diameter and heavier than .220 in. in minimum wall or 1/4 in. average wall thickness. These tubes are to be used for carrying oil at elevated temperatures and pressures in various types of oil stills in which the tubes may be subjected to a furnace temperature higher than that of the contained fluid. Includes requirements for process, heat treatment, chemical composition, check analysis, tension test, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, tolerances, finish, marking, inspection, certification, rejection, and rehearing.

American Iron and Steel Institute. Steel Products Manual, Section 18; 1938. Revised, 1944. Steel Tubular Products. Gives definitions, classifications, and manufacturing practices; stainless tubular products; tables of dimensions, weights, and hydrostatic test pressures; basic threading data; methods of calculating weights of couplings and upsets; standard machining allowances for seaming tubing for aircraft stock struts and landing gear; and standard methods of packing and loading steel tubular products.

American Society for Testing Materials, A 158-44T; 1944. A.S.M.E. Boiler Construction Code Specification SA-158. Tentative Specifications for Seamless Alloy-Steel Pipe for Service at Temperatures from 750 to 1,100° F. Includes eight ferritic and three austenitic steels. Gives heat treatment, chemical composition, ladle analysis, check analysis, tensile properties, bending properties, flattening test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in weight and dimensions, lengths, ends, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision, EA-158a; 1944, affected section 1, Scope; and table 1, Chemical Requirements.

American Society for Testing Materials, A 161-44; 1944. Seamless Low-Carbon and Carbon-Molybdenum Steel Still Tubes for Refinery Service. Covers 2 in. and over outside diameter, thicker than No. 5 B.W.G., for use in carrying oil at elevated temperatures and pressures in oil stills. Gives manufacture, chemical composition, check analysis, tensile properties, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 161; 1942, affected section 4, Chemical Composition.

American Society for Testing Materials, A 182-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-182. American Standards Assn., G37.1-1944.

Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for Service at Temperatures From 750 to 1,100° F. Includes seven ferritic and three austenitic steels, selection dependent on design and service. Gives requirements for manufacture, heat treatment, chemical composition, ladle analysis, check analysis, tensile properties, hydrostatic tests, test specimens, number of tests, retests, macroetch tests, workmanship, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 199-44; 1944. Seamless Cold-Drawn Intermediate Alloy-Steel Heat-Exchanger and Condenser Tubes. Covers several grades of chromium-molybdenum and chromium-molybdenum-silicon tubes in sizes from 1/2 in. to 2 in. in outside diameter. Gives manufacture, chemical composition, check analysis, tensile properties, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in dimensions, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 199; 1942, affected table I, Chemical Requirements; section 9, Hardness.

American Society for Testing Materials, A 200-44; 1944. Seamless Intermediate Alloy-Steel Still Tubes for Refinery Service. Covers several grades of chromium-molybdenum and chromium-molybdenum-silicon still tubes, 2 in. and over in outside diameter and thicker than No.5 B.W.G. Gives manufacture, chemical composition, check analysis, tensile properties, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 200; 1942, affected table I, Chemical. Requirements; section 9, Hardness.

American Society for Testing Materials, A 206-44T; 1944. A.S.M.E. Boiler Construction Code Specification SA-206. Tentative Specifications for Seamless Carbon-Molybdenum Alloy-Steel Pipe for Service at Temperatures From 750 to 1,000° F. For pipe suitable for bending, flanging (vanstoning), and similar forming operations, and fusion welding. Gives requirements for process, heat treatment, chemical composition, tensile and bending properties, flattening and hydrostatic tests, photomicrographs, test specimens, permissible variations in weight and dimensions, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 206; 1943, affected section 5, Chemical Composition.

American Society for Testing Materials, A 209-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-209. Seamless Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes. Covers three grades, with requirements for manufacture, chemical composition, tensile properties, flattening, flaring, hardness, and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 209; 1942, affected table I, Chemical Requirements.

American Society for Testing Materials, A 213-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-213. American Standards Assn., B36.17-1944. Seamless Alloy-Steel Boiler and Superheater Tubes. Includes ferritic and austenitic steels. Gives requirements for manufacture, chemical composition, check analysis, tensile properties, flattening, flaring, hardness, and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 213a; 1944, affected table I, Chemical Requirements of Ferritic Steel; table II, Chemical Requirements of Austenitic Steel; section 9, Hardness.

American Society for Testing Materials, A 234-44; 1944. Factory-Made Wrought Carbon-Steel and Carbon-Molybdenum-Steel Welding Fittings. For pressure piping, including butt welding or socket-end parts such as elbows, return bends, caps, tees, reducers, etc., but not including cast welding fittings. Gives requirements for material, manufacture, chemical composition, check analysis, heat treatment, tensile properties, hydrostatic tests, retests, workmanship and finish, marking, inspection, and rejection.

American Society for Testing Materials, A 249-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-249. Atomic-Hydrogen-Arc-Welded and Electric-Resistance-Welded Alloy-Steel Boiler and Superheater Tubes. For tubes made from austenitic steels. Gives process, manufacture, chemical composition, check analysis, tensile properties, flattening, flaring, hardness, and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 249a; 1944, affected table I, Chemical Requirements.

American Society for Testing Materials, A 250-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-250. Electric-Resistance-Welded Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes. For three grades of electric resistance-welded, carbon-molybdenum alloy-steel boiler and superheater tubes. Gives process, manufacture, chemical composition, check analysis, tensile properties; flattening, flaring, hardness, and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, rejection, and rehearing. A. S. T. M. Emergency Alternate Provision EA-A 250; 1942, affected table I, Chemical Requirements, and section 19, Markings.

American Society for Testing Materials, A 268-44T. Tentative Specification for Seamless and Welded Ferritic Stainless Steel Tubing for General Service. Covers scope, process, manufacture, chemical composition, check analysis, tensile properties, flaring test, hardness test, hydrostatic test, test specimens, number of tests retests, retreatment, permissible variations in dimensions, finish, marking, inspection, rejection, and rehearing. A. S. T. M. Emergency Alternate Provision EA-A 268; 1944, affected table I, Chemical Composition.

American Society for Testing Materials, A 269-44T. Tentative Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service. Covers scope, process, manufacture, chemical composition, check analysis, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in dimensions, finish, marking, inspection, rejection, and rehearing. A.S.T.M. Emergency Alternate Provision EA-A 269; 1944, affected table I, Chemical Composition.

American Society for Testing Materials, A 270-44T. Tentative Specification for Seamless and Welded Austenitic Stainless Steel Tubing for the Dairy and Food Industry. Covers scope, process, manufacture, chemical composition, check analysis, hydrostatic test, number of tests, permissible variations in dimensions, finish, packaging, marking, inspection, rejection, and rehearing. A.S.T.M. Emergency Alternate Provision EA-A 270; 1944, affected table I, Chemical Requirements.

American Society for Testing Materials, A 271-44T. Tentative Specification for Seamless Austenitic Chromium-Nickel Steel Still Tubes for Refinery Service. Covers scope, process, manufacture, chemical composition, check analysis, tensile properties, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in dimensions and weights, finish, marking, inspection, rejection, and rehearing. A.S.T.M. Emergency Alternate Provision EA-A 271; 1944, affected table I, Chemical Requirements.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Pipe; Copper-Molybdenum Iron. Covers definition, types and sizes, ordering copper-molybdenum iron pipe, and trade customs.

Society of Automotive Engineers. Aeronautical Material Specification 5022A; 1942. Steel; Free-Cutting Manganese (1.3 Manganese). Gives requirements for form (bars, billets, tubes, or forgings), composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5024A; 1942. Steel; Free-Cutting Manganese (1.5 Manganese). Gives requirements for form (bars, billets, tubing, or forgings), composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5560; 1944. Steel Tubing; Corrosion-Resistant, Seamless. Gives requirements for use, composition, condition, quality, embrittlement, tolerances, reports, identification, and rejections. Similar specifications: ASTM A213-42, grade T8; Army-Navy Aeronautical AN-WW-T-855, condition A; SAE 30905; AISI 304.

Society of Automotive Engineers. Aeronautical Material Specification 5565; 1944. Steel Tubing; Corrosion-Resistant, Welded. Gives requirements for use, composition, condition, quality, embrittlement, tolerances, reports, identification, and rejections. Similar specifications: Army-Navy Aeronautical AN-T-43, comp. 1; SAE 30905; AISI 304; ASTM A249-42, grade T8.

Society of Automotive Engineers. Aeronautical Material Specification 5570C; 1942. Seamless Steel Tubing, Corrosion- and Heat-Resistant (18 Chromium, 8 Nickel). Gives requirements for composition, condition, quality, embrittlement, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5575B; 1942. Welded Steel Tubing, Corrosion- and Heat-Resistant (18 Chromium, 8 Nickel). Covers requirements for composition, condition, quality, embrittlement, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6282; 1944. Steel Tubing; Seamless for Machined Parts To Be Heat-Treated, .55 Ni, .50 Cr, .25 Mo (.33-.38 C), Cold Finished or Hot Finished. Gives requirements for use, composition, grain size, condition, quality, tolerances, reports, identification, and rejections. Similar specification, NE 8735.

Society of Automotive Engineers. Aeronautical Material Specification 6283; 1944. Steel Tubing; Seamless for Machined Parts, .55 Ni, .50 Cr, .25 Mo (.33-.38 C), Normalized or Heat-Treated (90,000 T. S.). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections. Similar specification, NE 8735.

Society of Automotive Engineers. Aeronautical Material Specification 6284; 1944. Steel Tubing; Seamless for Machined Parts, .55 Ni, .50 Cr, .25 Mo (.35-.38 C), Heat-Treated (125,000 T.S.). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejection. Similar specification, NE 8735.

Society of Automotive Engineers. Aeronautical Material Specification 6285; 1944. Steel Tubing; Seamless for Machined Parts, .55 Ni, .50 Cr, .25 Mo (.33-.38C), Heat-Treated (150,000 T.S.). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejection. Similar specification, NE 8735.

Society of Automotive Engineers. Aeronautical Material Specification 6286; 1944. Steel Tubing; Seamless for Machined Parts, .55 Ni, .50 Cr, .25 Mo (.38-.43C) Heat-Treated (180,000 T.S.). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejection. Similar specification, NE 8740.

Society of Automotive Engineers. Aeronautical Material Specification 6312A; 1942. Steel; Nickel-Molybdenum. For bars, billets, forgings, tubing, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6323; 1944. Steel Tubing; Seamless for Machined Parts To Be Heat-Treated, .55 Ni, .50 Cr, .25 Mo (.38-.43 C), Cold Finished or

Hot Finished. Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections. Similar specification, NE 8740.

Society of Automotive Engineers. Aeronautical Material Specification 6360A; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.27-.33 Carbon) (Normalized). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6361; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.27-.33 Carbon) (125,000 T.S.-.188 Maximum Wall Thickness). Covers requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6362; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.27-.33 Carbon) (150,000 T. S.-.188 Maximum Wall Thickness). Covers requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6363; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.27-.33), (180,000 T. S.-.156 Maximum Wall Thickness). Covers requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6365; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.32-.39 Carbon) (Normalized). Covers requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6366; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.32-.39 Carbon) (125,000 T.S.). Covers requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6367; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.32-.39 Carbon) (150,000 T.S.). Covers requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6368; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.32-.39 Carbon) (180,000 T.S.). Covers requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6369; 1942. Steel Tubing (Seamless); Round, Chromium-Molybdenum (.32-.39 Carbon) (200,000 T.S.). Covers requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6371; 1942. Steel Tubing (Seamless for Machined Parts); Chromium-Molybdenum (.27-.33 Carbon), Hot-Finish or Cold-Finish. Gives requirements for composition, grain size, condition, quality, tolerances for round seamless tubing, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6381; 1942. Steel Tubing (Seamless for Machined Parts); Chromium-Molybdenum (.35-.42 Carbon), Hot-Finish or Cold-Finish. Gives requirements for composition, grain size, condition, quality, tolerances for round seamless tubing, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6413; 1942. Steel Tubing (Seamless for Machined Parts); Nickel-Chromium-Molybdenum (.35-.42 Carbon), Hot-Finish or Cold-Finish. Gives requirements for composition, grain size, condition, quality, tolerances for round seamless tubing, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6420; 1944. Steel Tubing; Seamless for Machined Parts, 1.8 Ni, .80 Cr, .25 Mo (.38-.43C), Heat Treated (200,000 T.S.). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejection. Similar specification, SAE 4340.

Society of Automotive Engineers. Aeronautical Material Specification 6510; 1942. Steel Tubing (Welded); Chromium-Molybdenum (.27-.33 Carbon) (Normalized). Gives requirements for type, composition, grain size, condition, quality, tolerances, tests, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6530A; 1943. Steel Tubing (Seamless); Round, .55 Ni, .5 Cr, .2 Mo (.27-.33 C) (Normalized). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6531; 1944. Steel Tubing; Seamless, Round, .55 Ni, .5 Cr, .2 Mo (.27-.33C) Heat Treated (125,000 T.S.). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections. Similar Specifications: Army-Navy Aeronautical AN-T-15, condition HT125; NE 8630.

Society of Automotive Engineers. Aeronautical Material Specification 6535A; 1943. Steel Tubing (Seamless); Round, .55 Ni, .5 Cr, .25 Mo (.33-.38 C) (Normalized). Gives requirements for composition, grain size, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6550A; 1943. Steel Tubing (Welded); .55 Ni, .5 Cr, .2 Mo (.27-.33 C) (Normalized). Covers electric-resistance-welded or gas-welded tubing. Gives requirements for chemical composition, grain size, condition, quality, tolerances, tests, reports, identification, and rejections.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-3; 1942. Tubing; Steel, Chrome-Molybdenum (X4130), Welded.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-14-2; 1944. Tubing; Corrosion-Resisting Steel, Flexible.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-15-2; 1943. Tubing; (.27 to .33 Carbon), Chrome-Nickel-Molybdenum Steel, Seamless.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-22-2; 1943. Tubing; (.33 to .38 Carbon), Chrome-Nickel-Molybdenum Steel, Seamless.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-33-1; 1943. Tubing; (.27 to .33 Carbon), Chrome-Nickel-Molybdenum Steel, Welded.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-43-1; 1944. Tubing; Welded Corrosion-Resisting (18 Cr, 8Ni) Steel, Round, for Hydraulic Systems.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-T-850a-1; 1943. Tubing; Steel, Chrome-Molybdenum (X4130), Seamless.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-T-852a; 1942. Tubing; Steel, Chrome-Molybdenum (X4135), Seamless.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-T-855-1; 1942. Tubing; Steel, Corrosion-Resisting (18Cr, 8 Ni), Round, Seamless.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-T-858-1; 1942. Tubing; Steel, Corrosion-and Heat-Resisting (18 Cr, 8 Ni), Round, Seamless.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-T-881-2; 1942. Tubing; Steel, Corrosion- and Heat-Resisting (18 Cr, 8 Ni), Welded, Round.

U. S. Gov., Navy Dept. Specification 44T33; 1938. Tubing; Steel, Molybdenum-Alloy, Seamless.

U. S. Gov., Navy Dept. Specification 49T11; 1937. Tubing; Steel, Corrosion-Resisting (18 Percent Chromium and 8 Percent Nickel), Seamless-Drawn, Streamline-Cross-Section (Aircraft Use).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-180-3C; 1942. Tubing; Steel, 18 Chrome and 8 Nickel, Corrosion- and Heat-Resistant, Seamless and Welded.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-180D; 1942. Tubing; Mechanical or Structural Steel, Carbon, and Alloy, Seamless, Welded and Brazed.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-195; 1944. Tubing; Flexible, Corrosion-Resistant Steel and Aluminum Alloy.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; carbon steel tubular goods, *see* 607.4.

622.4 FERRO-ALLOY WIRE AND MANUFACTURES

Society of Automotive Engineers. Aeronautical Material Specification 5880; 1939. Steel Wire; Corrosion-Resistant, 18 Chromium, 8 Nickel (Welding). Gives requirements for composition, condition, quality, tolerance, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5885A; 1942. Steel Wire; Corrosion-Resistant, 18 Chromium, 8 Nickel (Annealed). Gives requirements for composition, condition, quality, tolerances, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5688A; 1942. Steel Wire; Corrosion-Resistant, 18 Chromium, 8 Nickel (Spring). Gives requirements for composition, condition, quality, tolerances, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5690B; 1944. Steel Wire; Screen, Corrosion-Resistant, 18 Chromium, 8 Nickel, 2 Molybdenum. For cold drawn wire or cold drawn wire screening. Gives requirements for composition, condition, quality, tolerances, reports, and rejections.

Society of Automotive Engineers. Aeronautical Standard 38; 1941. Seamless Steel Lockwire (Aircraft Engines). Diagrammatic dimensional drawing for corrosion-resistant (18 chromium, 8 nickel, annealed) steel lockwire .032 in., .040 in., and .051 in. in diameter.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-W-423-1; 1942. Wire; Steel, Corrosion-Resisting.

U. S. Gov., Army-Navy Aeronautical Specification AN-RR-C-48-2; 1943. Cable; Steel, Corrosion-Resisting, Flexible, Preformed.

U. S. Gov., Navy Dept. Specification 22C4b; 1941. Cable; Steel, Corrosion-Resisting, Flexible and Extra Flexible, Preformed Type (Aircraft Use).

U. S. Gov., Navy Dept. Specification 22C7; 1939. Cable; Steel, Corrosion-Resisting, Nonflexible, 7-Wire or 19-Wire Strand, Preformed Type (Aircraft Use).

U. S. Gov., Navy Dept. Specification 46R4b; 1940. Wire (and Rods); Welding, Iron and Steel, for Gas Welding.

U. S. Gov., Navy Dept. Specification 57S51; 1944. Sutures; Corrosion-Resisting Steel-Alloy-Wire.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2032A 1941. Wire Gauze.

U.S. Gov., U.S. Army, Medical Dept. Specification 10-2969A; 1941. Wire; Corrosion-Resisting Steel, Surgical.

References.—Electrical resistance wire, *see* 715.43; methods of testing, general requirements for metals, *see* 600.1, 621.30; wire gages, *see* 603.40; carbon steel wire, *see* 603.41; welding rod and wire, *see* 603.26; Fourdrinier wire cloth of stainless steel wire, *see* 645.39.

622.5 FERRO-ALLOY CASTINGS

American Society for Testing Materials, A 128-33; 1933. Austenitic Manganese-Steel Castings. Often referred to as Hadfield's manganese steel. Requirements for heat treatment, chemical composition, ladle analysis, bend test where specified, test specimen, finish, and inspection.

American Society for Testing Materials, A 157-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-157. American Standards Assn., G36.1; 1944. Alloy-Steel Castings for Valves, Flanges, and Fittings for Service at Temperatures From 750 to 1,100° F. Includes nine ferritic and two austenitic grades, selection dependent on design and service. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, number of tests, retests, tensile and bending properties, hydrostatic tests, magnetic particle testing, test specimens, radiographic or destruction test, workmanship, marking, finish, inspection, and rejection. A.S.T.M. Emergency Alternate

Provision EA-A 157; 1944, affected section 10, Hydrostatic Tests.

American Society for Testing Materials, A 198-39; 1939. 20 Percent Chromium, 9 Percent Nickel Alloy-Steel Castings. For corrosion-resisting service, includes heat treatment, chemical composition, tensile and bending properties, hardness, test specimen, corrosion test, stability of microstructure, finish, and inspection.

American Society for Testing Materials, A 217-44T; 1944. A.S.M.E. Boiler Construction Code Specification SA-217. Tentative Specifications for Alloy-Steel Castings Suitable for Fusion Welding for Service at Temperatures From 750 to 1,100° F. For valves, flanges, fittings, or other pressure containing parts. In four grades, with requirements for process, heat treatments, temperature control, chemical composition, analyses, tensile and bending properties, hydrostatic tests, magnetic particle testing, test specimens, number of tests, retests, radiographic or destruction tests, workmanship, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 217; 1942, affected section 1 (b) New Grade Added; section 5, Chemical Composition; section 8, Tensile Properties; and section 17, Marking.

American Society for Testing Materials, A 221-39; 1939. American Assn. of State Highway Officials Standard M104-39. Chromium-Alloy-Steel Castings. Covers three classes including stainless, corrosion-resisting and heat-resisting castings. Requirements for heat treatments, chemical compositions, tensile and bending properties, hardness, test specimen, finish, and inspection.

American Society for Testing Materials, A 222-39; 1939. Chromium-Nickel Alloy-Steel Castings. For three classes of alloy, requirements for heat treatment, chemical composition, tensile and bending properties, hardness tests, test specimen, finish, and inspection.

American Society for Testing Materials, A 223-39; 1939. Nickel-Chromium Alloy-Steel Castings. Covers two classes of high nickel castings; requirements for heat treatment, chemical composition, ladle analysis, tensile and bending properties, hardness tests, test specimen, finish, and inspection.

American Society for Testing Materials, B190-44T; 1944. Tentative Specifications for Chromium-Nickel-Iron Alloy Castings (25-12 class) for High-Temperature Service. Gives scope, process, heat treatment, chemical composition, ladle analysis, check analysis, number of tests, tensile properties after aging, magnetic permeability, stress-rupture test; short-time, high-temperature tensile properties; sampling, defective test specimens, retests, report, dimensional tolerances, finish, marking, and inspection.

American Transit Assn. Standard Design of Solid Manganese Steel Crossings; Steam Railroad Over Electric Railway for 7 Inch and 9 Inch Girder Rails, W29-35; 1935. Gives dimensional designs for solid manganese-steel crossings for angles 90° to 60°, inclusive.

American Transit Assn. Standard Design for Solid Manganese-Steel Crossings; Steam Railroad Over Electric Railway for 7 Inch and 9 Inch Girder Rails, W30-35; 1935. Gives dimensional designs for solid manganese-steel crossings for angles below 60° to 40°, inclusive.

American Transit Assn. Standard Design of Solid Manganese-Steel Crossings; Steam Railroad Over Electric Railway, W37-35; 1935. Gives dimensional designs of solid manganese-steel crossings for angles 90° to 60°, inclusive.

American Transit Assn. Standard Design of Solid Manganese-Steel Crossings; Steam Railroad Over Electric Railway, W38-35; 1935. Gives dimensional designs of solid manganese-steel crossings for angles below 60° to 40°, inclusive.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. High Chrome Steel Castings for Valves for Nitric Acid Tank Cars, M-251-29; 1929. Electric furnace steel, requirements for casting alloy, analysis, heat treatment, workmanship, and porosity test.

Hydraulic Institute. Material Specification for Nickel-Base Austenitic Cast Iron (Ni-Resist) No. 115; 1939. This specification covers a nickel-base austenitic cast iron, ordinarily containing a substantial percentage of copper, for resistance to many forms of corrosion. Includes manufacture, chemical composition, physical properties and tests, pattern equipment, workmanship, welding, hydrostatic tests, and inspection.

Hydraulic Institute. Material Specification for Carbon and Alloy Steel Castings, No. 120; 1939. These specifications cover steel castings used in the manufacture of pumping equipment; castings of one grade of carbon steel and four alloy steels. Gives requirements for manufacture, chemical composition, test coupons, heat treatment, physical properties, and impact properties, methods of test, pattern equipment, workmanship, welding, and for hydrostatic tests.

Society of Automotive Engineers. Aeronautical Material Specification 5345; 1944. Centrifugal Steel Castings, Chromium Molybdenum (.38-.43 Carbon). For cylinder barrel and sleeve castings. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, identification, and rejections.

Technical Assn. of the Pulp and Paper Industry. Specifications for Chromium-Nickel-Iron Castings for Sulphite Pulp Processing Equipment. Standard E400 s44; 1944. Covers castings for sulphite pulp processing such as relief valves, strainers, pumps, digester fittings, etc. Gives chemical composition, heat treatment, analysis, physical tests, pickling, and finish requirements.

U. S. Gov., Navy Dept. Specification 46S27a; 1936. Steel; Corrosion-Resisting, Castings.

U. S. Gov., Navy Dept. Specification 46S41; 1940. Steel; Chromium-Molybdenum-Alloy, Wrought.

U. S. Gov., Navy Dept. Specification 46S45; 1941. Steel; Alloy (Special), Castings (Aircraft Use).

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels, and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for steel castings for valves, flanges, fittings, or other pressure containing parts of carbon-steel for service temperatures up to and including 850° F. and carbon-molybdenum alloy steel for service temperatures to 1,000° F.; process, heat treatment, chemical compositions, tensile properties, bending properties, tests, retests, workmanship, and finish.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; heat treatments, *see* 600.5; classification of railway materials, *see* 600.2; railway construction and special track work, *see* 606.0, 606.3; carbon steel castings, *see* 611.41; other specifications for cast alloy steel, *see* specifications for individual commodities made of cast alloy steel.

622.6 FERRO-ALLOY FORGINGS

American Iron and Steel Institute. Steel Products Manual, Section 22; 1939. Revised, 1943. Forged Axles and Locomotive Forgings. Covers forgings used principally for locomotives and cars for steam and electric railways and also for industrial railway equipment. Manufacturing practices, chemical requirements and texts, physical properties and tests, workmanship and finish, permissible variations and weights, marking and storing, inspection, rejection, and rehearing.

American Society for Testing Materials, A 237-42; 1942. Alloy-Steel Forgings for General Industrial Use. Covers annealed, normalized and tempered, and normalized, quenched, and tempered forgings in six classes; requirements as to heat treatment, chemical composition, tensile properties, boring and turning, bending properties, test specimens, and workmanship. A.S.T.M. Emergency Alternate Provision EA-A 237; 1943, affected table I, Tensile Requirements.

American Society for Testing Materials, A 238-42; 1942. Alloy-Steel Forgings for Locomotives and Cars. Includes three classes normalized and tempered, and three classes normalized, quenched, and tempered. Gives requirements as to heat treatment, chemical composition, boring and turning, tensile and bending properties, test specimens, microscopic and macroscopic tests for grain structure, workmanship, and inspection. A.S.T.M. Emergency Alternate Provision EA-A 238; 1942, affected Section 7, Chemical Composition, and section 14, Omit Macroscopic Examination.

American Society for Testing Materials A 243-43; 1943. Carbon-Steel and Alloy-Steel Ring and Disk Forgings. Cover untreated, annealed, normalized, normalized and tempered, quenched and tempered, double normalized and tempered, and normalized, quenched, and tempered carbon steel and alloy steel ring and disk forgings for general industrial use. Covers manufacture, machining, heat treatment, chemical composition, analysis, tensile and bending properties, test specimens, testing, workmanship, marking, inspection, and rejection.

American Society for Testing Materials, ES-21; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Magnetic Retaining Rings for Turbine Generators. Cover annealed, quenched, and tempered carbon-steel and alloy-steel forgings for mangetic retaining rings for turbine generators. Process, discard, manufacture, machining, heat treatment, chemical composition, analysis, tensile properties, test specimens, tests, retests, workmanship, finish, marking, inspection, and rehearing.

American Society for Testing Materials, ES-22; 1943. Emergency Specifications for Alloy-Steel Forgings for Nonmagnetic Coil Retaining Rings for Turbine Generators. Cover alloy-steel forgings for coil retaining rings for turbine generators. Process, discard, manufacture, heat treatment, chemical composition, analysis, tensile properties, test specimens, tests, retests, workmanship, finish, marking, inspection, and rehearing.

American Society for Testing Materials, ES-24; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Pinions for Main Reduction Gears. Cover normalized and tempered, or quenched and tempered, carbon-steel and alloy-steel forgings for pinions for main reduction gears and for auxiliary drives. Process, discard, manufacture, machining, heat treatment, chemical composition, analysis, tensile properties, hardness, test specimens, tests, retests, workmanship, finish, marking, inspection, and rehearing.

American Society for Testing Materials, ES-25; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Turbine Generator Rotors and Shafts. Cover annealed, normalized and tempered, and double normalized and tempered carbon-steel and alloy-steel forgings for turbine generator rotors and shafts. Process, discard, manufacture, machining, heat treatment, chemical composition, analysis, tensile properties, test specimens, number of tests, retests, magnetic test, workmanship, finish, marking, internal inspection, inspection, and rehearing.

American Society for Testing Materials, ES-26; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Turbine Rotors and Shafts. Cover annealed, normalized and tempered, and double normalized and tempered carbon-steel and alloy-steel forgings for turbine rotors and shafts. Process, discard, manufacture, heat treatment, chemical composition, analysis, tensile properties, test specimens, number of tests, retests, stability test, magnetic test, workmanship, finish, marking, internal inspection, inspection, and rehearing.

American Society for Testing Materials, ES-27; 1943. Emergency Specifications for Carbon-Steel and Alloy-Steel Forgings for Turbine Bucket Wheels. Cover annealed or annealed, quenched, and tempered carbon-steel and alloy-steel forgings for turbine bucket wheels. Process, discard, manufacture, machining, heat treatment, chemical composition, analysis, tensile properties, hardness, test specimens, number of tests, retests, workmanship, finish, marking, inspection, and rehearing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Forgings. Covers definition, characteristics, classes of forgings, forgeable metals, and commercial forging practice.

Society of Automotive Engineers. Aeronautical Material Specification 5022A; 1942. Steel; Free-Cutting Manganese (1.3 Manganese). Gives requirements for form (bars, billets, tubes, or forgings), composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5024A; 1942. Steel; Free-Cutting Manganese (1.5 Manganese). Gives requirements for form (bars, billets, tubing, or forgings), composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5025; 1942. Steel; Free-Cutting Manganese (Heat Treated). Covers requirements for form (bars, billets, forgings, or as ordered), composition, condition, quality, tolerances, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5610B; 1944. Steel; Corrosion Resistant, 13 Chromium (Free Machining). For bars, billets, forgings, or as ordered. Covers composition, condition, hardenability, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5615A; 1942. Steel; Corrosion-Resistant, 13 Chromium, 1.5 Nickel. Gives requirements for form (bars, billets, forgings, or as ordered), composition, condition, hardenability, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5630A; 1942. Steel; Corrosion-Resistant, 17 Chromium (High-Carbon). Gives requirements for form (bars, billets, forgings, or as ordered), composition, condition, hardenability, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5632; 1942. Steel; Corrosion-Resistant, 17 Chromium, .5 Molybdenum (High-Carbon) (Free-Machining). Covers requirements for form (bars, billets, forgings, or as ordered), composition, condition, hardenability, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5640A; 1942. Steel; Corrosion-Resistant, 18 Chromium, 8 Nickel (Free-Machining). For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5641; 1942. Steel; Corrosion-Resistant, 18 Chromium, 8 Nickel (Swaging- or Hot-Upsetting Type). For bars, billets, forgings, or as ordered. Covers requirements for composition, condition, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5645B; 1942. Steel; Corrosion- and Heat-Resistant, 18 Chromium, 8 Nickel. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, embrittlement, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5700; 1940. Steel; Valve (Chromium-Nickel-Tungsten). For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 5705; 1942. Steel; Valve, Chromium-Nickel Silicon. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 5710; 1942. Steel; Valve, Chromium-Silicon Nickel. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6240B; 1942. Steel; Carburizing (5 Percent Nickel). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6242B; 1942. Steel; Carburizing (5 Percent Nickel). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6250C; 1942. Steel; Carburizing, Nickel-Chromium (Light-Section). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6252C; 1942. Steel; Carburizing, Nickel-Chromium (Heavy Section). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6253D; 1944. Steel; Carburizing, Nickel-Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6254C; 1942. Steel; Carburizing, Nickel-Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6260A; 1944. Steel; 3 Ni, 1 Cr, .1 Mo (.08-.13C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6262A; 1944. Steel; 3 Ni, 1 Cr, .1 Mo (.08-.13C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6263A; 1944. Steel; 3 Ni, 1 Cr, .1 Mo (.09-.14C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6264A; 1944. Steel; 3 Ni, 1 Cr, .1 Mo (.15-.20 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6270B; 1944. Steel; Carburizing, .5 Ni, .5 Cr, .2 Mo (.12-.17C). For bars, billets, forgings, or as ordered. Gives requirements for chemical composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6272B; 1944. Steel; Carburizing, .5 Ni, .5 Cr, .2 Mo (.15-.20C). For bars, billets, forgings, or as ordered. Gives requirements for chemical composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6274B; 1944. Steel; Carburizing, .5 Ni, .5 Cr, .2 Mo (.17-.22C). For bars, billets, forgings, or as ordered. Gives requirements for chemical composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6280A; 1943. Steel; .55 Ni, .5 Cr, .2 Mo (.27-.33 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6290C; 1944. Steel; Carburizing, 1.8 Ni, .25 Mo (.11-.17C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6292C; 1944. Steel; Carburizing, 1.8 Ni, .25 Mo (.15-.20C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6294C; 1944. Steel; Carburizing, 1.8 Ni, .25 Mo (.17-.22C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.6300; 1943. Steel; .25 Mo (.35-.40 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specifications 6310A, 6315A, and 6317A; 1942. Steel; Nickel Molybdenum. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6312A; 1942. Steel; Nickel Molybdenum. For bars, billets, forgings, tubing, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6320A; 1943. Steel; .55 Ni, .5 Cr, .25 Mo (.33-.38 C). For bars, billets, forgings, or as ordered. Chemical composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6322A; 1943. Steel; .55 Ni, .5 Cr, .25 Mo (.38-.43 C). For bars, billets, forgings, or as ordered. Chemical composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6325A; 1943. Steel; .55 Ni, .5 Cr, .25 Mo (.38-.43 C) (105,000 T.S.). For bars, billets, castings, or as ordered. Chemical composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6327A; 1943. Steel; .55 Ni, .5 Cr, .25 Mo (.38-.43 C) (125,000 T. S.). For bars, billets, forgings, or as ordered. Chemical composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 6330A; 1942. Steel; Nickel Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specifications Nos.6332 and 6335, 1939; and 6337, 1940. Steel; Nickel Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerance, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.6342; 1944. Steel; 1 Ni, .8 Cr, .25 Mo (.38-.43 C). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, hardenability, condition, quality, tolerances, reports, shipments, identification, and rejections. Similar specification, NE 9840.

Society of Automotive Engineers. Aeronautical Material Specification 6370A; 1942. Steel; Chromium-Molybdenum (.27-.33 Carbon). For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerance, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6380A; 1942. Steel; Chromium-Molybdenum (.35-.43 Carbon). For bars, billets, forgings, or as ordered. Covers requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6382A; 1942. Steel; Chromium-Molybdenum, (.38-.43 Carbon). For bars, billets, forgings, or as ordered. Covers requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6412A; 1942. Steel; Nickel-Chromium-Molybdenum. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6415A; 1942. Steel; Nickel-Chromium-Molybdenum. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6440A; 1943. Steel; Chromium. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, tolerances, reports, shipments, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 6448A; 1944. Steel; Chromium Vanadium. For bars, billets, forgings, or as ordered. Gives requirements for composition, grain size, condition, quality, tolerances, reports, shipments, identification, and rejections. Similar specifications, Army-Navy Aeronautical AN-QQ-S-687 and SAE 6150.

Society of Automotive Engineers. Aeronautical Material Specification 6470A; 1942. Steel; Nitriding (Chromium-Molybdenum-Aluminum). Gives requirements for form (bars, billets, forgings), composition, condition, nitriding, quality, reports, shipments, identification, and rejections.

U. S. Gov., Federal Specification QQ-S-763a; 1943. Steel; Corrosion-Resisting, Bars and Forgings (Except for Reforging). Covers ten classes and six grades and shall be made by the open-hearth or the electric furnace process unless otherwise specified. Gives chemical requirements and physical properties; method of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46S39a; 1942. Steel; Forgings for Turbine Rotors (Heat Treated).

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for three grades of forged or rolled steel for pipe flanges, forged fittings, and valves and parts for service temperatures up to 1,000° F.; process, manufacturing practice, heat treatment, chemical composition, tensile properties, tests, retests, macrotests, workmanship, finish, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-103-1; 1938. Steel; Nickel-Chromium, W.D.3415, Forged Bar for Breechblock.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; heat treatments, *see* 600.5; classification of railway materials, *see* 600.2; carbon steel forgings, axles, and shafts, *see* 611.51, 611.52.

622.7 FERRO-ALLOY SPRINGS

References.—Alloy steel stock for springs, *see* 621.34.

622.9 MISCELLANEOUS MANUFACTURES OF ALLOY STEEL

American Hospital Assn., 4-10. Wire Screen Cloth. Covers copper, commercial bronze (brass), bronze, iron or steel, galvanized (zinc coated), copper-nickel alloy, corrosion-resisting steel (chromium-nickel), aluminum alloy, iron or steel, japanned or painted, and chromium-nickel alloy.

American Transit Assn. Standard Design of Bolted Manganese-Steel Crossings; Steam Railroad Over Electric Railway, W44-35; 1935. Gives the dimensional designs of bolted manganese-steel crossings for angles below 45° to 30°, inclusive.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div., Manual of Standard and Recommended Practice, 1942. High Chrome Steel Rivet Material and Rivets for Nitric Acid Tank Cars, M-151-29; 1929. Electric furnace steel, composition, analysis, physical properties, permissible variations, requirements for fabrication, tests, workmanship, and finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Seamless High Chrome Steel Tubing for Nitric Acid Tank Cars, M-152-29; 1929. Fabricated from electric furnace steel, composition, analysis, flanging, flattening, and bend tests, method of pickling tubes, and finish.

Society of Automotive Engineers. Aeronautical Material Specification No.7210; 1940. Cotter Pins;

Corrosion-Resistant Steel. Gives requirements for composition, condition, quality, shape, tolerance, sizes, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.7228; 1940. Rivets; Corrosion-Resistant Steel. Gives requirements for composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. Aeronautical Standard 39; 1941. Stainless Steel Cotter Pins; Aircraft Engine. Diagrammatic dimensional drawings showing minimum eye and drill hole diameters of corrosion resistant steel (18 chromium, 8 nickel) cotter pins 1/16 in. to 5/16 in. in diameter, .313 in. to 2.500 in. in length.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-27-1; 1944. Propeller Blades; General Specification for Steel.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS37-31; 1931. Steel Bone Plates and Screws. A commercial standard selected and adopted by industry for Sherman type bone plates made of chromium-vanadium steel, requirements on chemical composition of plates and screws corresponding to S.A.E. steel No. 6150, hardness, dimensions, and design of 14 plate sizes, and 11 screw sizes. Sponsored by the American College of Surgeons.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Blast Plates.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-5672; 1940. Tag; Cable, M-3, Submarine Mine.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-16A; 1939. Bit; Curb, M-1909 and M1920.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-17B; 1942. Bit; Snaffle, M1909 and M1911.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-32A; 1942. Stirrup M1912 and M1938.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-21-G; 1938. Tray; Photographic, Corrosion-Resisting Steel.

References.—Methods of testing, general requirements for metals, *see* 600.1, 621.30; heat treatments, *see* 600.5; special trackwork, *see* 606.3; hack saw blades of alloy steel, *see* 615.62; measuring gages of alloy steel, *see* 615.82.

630-639 ALUMINUM, ANTIMONY, BISMUTH, CADMIUM, AND COBALT

631. ALUMINUM

631.0 GENERAL ITEMS

Aluminum Research Institute. Standard Methods for the Sampling and Analyzing of Aluminum and Certain Aluminum Alloys, 1939. The methods are designed primarily for the casting alloys, but with suitable revisions may be employed on pure aluminum and for hardener-type alloys. Includes sampling procedure and methods for analyzing for the determination of chromium, copper, copper plus lead, iron, lead, magnesium and calcium, manganese, nickel, silicon, tin, titanium, and zinc.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Metallic Aluminum. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel, No.2; 1941. Direct Consumption of Aluminum in the Steel Industry. A study of the proper utilization and distribution of aluminum used in the steel industry for purposes of deoxidation and alloying. Covers effect of a decrease in aluminum on steel production, steps taken to decrease aluminum consumption, grades of aluminum, and suggested method of distributing aluminum.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for working stresses (tension, compression, shearing, bearing) of the cast, rolled, drawn, or extruded metals used.

American Society for Metals. Metals Handbook, 1939 Edition. Constitution of Aluminum Alloys and Properties of Aluminum and Its Alloys. Covers constitution of aluminum-chromium, aluminum-copper, aluminum-iron, aluminum-magnesium, aluminum-manganese, aluminum-nickel, aluminum-silicon, aluminum-titanium, aluminum-magnesium silicide, and aluminum-magnesium-zinc alloys; physical constants of aluminum and properties of commercially pure wrought aluminum; and properties of the various aluminum alloys.

American Society for Metals. Metals Handbook, 1939 Edition. Micrography and Technology of Aluminum. Covers polishing aluminum for metallographic examination, etching aluminum for metallographic examination, hardeners for aluminum, temperature measurements in molten aluminum, aluminum die castings, cold and hot forming aluminum alloys, heat treatment of wrought aluminum alloys, machining aluminum, spinning of aluminum, and protection of aluminum against corrosion.

American Society for Testing Materials, B 110-39 T; 1939. Tentative Method of Test for Dielectric Strength of Anodized Aluminum. For anodic coatings applied to aluminum and its alloys, also for measure of thickness of coating where properties are known. Requirements for high-voltage transformer, electrode, test specimens, surrounding medium, condition and position of electrodes, and application of voltage.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Aluminum. Covers definition, constants, solubility, properties, occurrence, derivation, grades and commercial forms, alloys, and uses.

Society of Automotive Engineers, Inc. Aeronautical Information Report No. 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Aluminum Alloys. Gives table showing specifications used in the U.S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers bars and shapes, wire and rivets, forgings, sheet and strip, tubing, and castings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C66; 1917. Standard Samples for Thermometric Fixed Points. Description of preparation of pure samples of aluminum, their chemical analyses, freezing points, and degree of purity, their use for the standardization of thermocouples, pyrometers, etc.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C346; 1927. Light Metals and Alloys, Aluminum and Magnesium. Gives detailed information on the physical and mechanical properties of aluminum and magnesium and of their light alloys; and the variation in properties caused by changing the composition of the alloy, by the presence of impurities, by changes in conditions of manufacturing operations, and by heat treatment. Discusses the metallography, corrosion resistance, and methods of protection against corrosion, the theory of heat treatment, and the application of the alloys to industry.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Aluminum, Sample 44c. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Navy Dept. General Specifications for Inspection of Materials, 1941, Appendix II, Metals, Part B, Section 1, Methods and Analysis of Aluminum and Aluminum Alloys.

631.1 ALUMINUM ALLOYS, INGOTS, AND BARS

References.—Aluminum bronze, *see* 647.1.

631.11 Alloys, Aluminum

American Society for Testing Materials; B 89-44T; 1944. Society of Automotive Engineers Specification No.26. Tentative Specifications for Aluminum-Alloy (Duralumin) Bars, Rods, Wire, and Shapes (Aluminum-Copper-Magnesium-Manganese). Manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper, tensile and bending properties, test specimens, methods of testing, permissible variations in dimensions, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4118B; 1943. Aluminum Alloy, Copper-Manganese-Magnesium (17S-T); Rolled. For rods, bars, or shapes. Composition, condition (heat-treated), quality, tolerances, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4151A; 1944. Aluminum Alloy, Copper Manganese Magnesium (17S-T); Extruded. For rods, bars, or shapes. Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections. Similar specifications, Navy 46A4 condition T, Federal QQ-A-351 condition T, SAE 26 temper T, and ASTM B89-42T, heat treated.

Society of Automotive Engineers. Aeronautical Material Specification 4152B; 1943. Aluminum Alloy, Copper Magnesium Manganese (24S-T); Extruded. Gives requirements for composition, tensile strength, yield strength, elongation, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. Notes on Aluminum Alloys, revised 1944. Provides a considerable range in properties and characteristics but all of the alloys commercially available are not included. Gives usual form, general information, cast aluminum alloys, wrought aluminum alloys, and tables covering various types.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Aluminum Alloy, Wrought, Sample 85; and Aluminum Base Casting Alloy; Sample 86b. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Navy Dept. Specification 46A3e; 1941. Aluminum (AL-2); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A4g; 1941. Aluminum Alloy (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A7d; 1941. Aluminum-Alloy; Heat-Treated Forgings.

U. S. Gov., Navy Dept. Specification 46A9e; 1942. Aluminum-Alloy (AL-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 57-152-1; 1924. Aluminum-Copper-Magnesium Alloy; Specification for Parts Made From.

References.—Methods of testing, general requirements for metals, *see* 600.1, 631.0; other aluminum alloys, *see* 631.12, 631.23, 631.31, 631.41, magnesium alloy castings, *see* 695.

631.12 Ingots, Aluminum

American Society for Testing Materials, B 24-44; 1944. Aluminum Ingots for Remelting. Includes four grades of commercial aluminum ingots for remelting. Gives process, quality, chemical composition, sample, sampling, methods of chemical analysis; inspection, rejection, and rehearing. Endorsed by the American Foundrymen's Assn.

American Society for Testing Materials, B37-42T; 1942. Tentative Specifications for Aluminum for Use in Iron and Steel Manufacture. Includes four grades of commercial ingots, rods, or shot, for use in iron and steel manufacture. Process, quality, chemical composition, method of chemical analysis, inspection, rejection, and rehearing.

American Society for Testing Materials, B 58-44T; 1944. Tentative Specifications for Aluminum-Base Alloys in Ingot Form for Sand Castings. For specific gravity not exceeding 3.0. Gives process, quality, chemical composition, sample for chemical analysis, sampling for chemical analysis, methods of chemical analysis, inspection, rejection, and rehearing.

American Society for Testing Materials, B 112-44T; 1944. Tentative Specifications for Aluminum-Base Alloys in Ingot Form for Permanent Mold Castings. Covers ten commercial alloys in ingot form for remelting for manufacture of permanent mold castings, specific gravity not exceeding 3.0. Gives process, quality, chemical composition, sample for chemical analysis, sampling for chemical analysis, methods of chemical analysis, inspection, rejection, and rehearing.

American Society for Testing Materials, B 125-44T; 1944. Tentative Specifications for Aluminum-Base Alloys in Ingot Form for Die Castings. For remelting for the manufacture of die castings with a specific gravity under 3.0. Gives requirements for chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, inspection, and rejection.

U. S. Gov., Federal Specification QQ-A-371a; 1939. Amendment 1; 1941. Aluminum-Alloy; Ingots. Covers twelve classes. Gives requirements for material, workmanship, chemical composition, and mechanical properties; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-451a; 1941. Aluminum; Ingots. Covers five grades—1 to 5. Gives requirements for material, workmanship, chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46A2c; 1940. Aluminum Ingot.

U. S. Gov., Navy Dept. Specification 46A5d; 1943. Aluminum Alloy; Ingot.

References.—Aluminum alloys, *see* 631.11; methods of testing, general requirements for metals, *see* 600.1, 631.0.

631.13 Bars, Aluminum

Society of Automotive Engineers. Aeronautical Material Specification 4120A; 1942. Aluminum Alloy Bars (Rolled) Copper Magnesium Manganese (24S-T). Gives requirements for composition, condition (heat treated), tensile strength, yield strength, elongation, quality, tolerances, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification No.4150; 1944. Aluminum Alloy, Magnesium Silicon Copper (61ST); Extruded. For rods, bars, or shapes. Covers composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

U. S. Gov., Army Air Forces. Specification 11330-A-1; 1944. Bars and Rods; Aluminum Alloy, 11S, Free Machining.

U. S. Gov., Federal Specification QQ-A-315; 1943. Aluminum Alloy (A1-52) (Aluminum-Magnesium-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and following conditions: Wire—(A) soft, (1/2H) half-hard, (3/4H) three-quarters-hard, and (H) hard; and bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, and lengths; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Federal Specification QQ-A-325; 1944. Aluminum-Alloy (AL-61) (Aluminum-Magnesium-Silicon-Copper-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and three conditions—(A) annealed, (B) quenched, and (C) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, various lengths, tolerances, and marking; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-331b; 1942. Aluminum-Alloy (A1-53) (Aluminum-Magnesium-Silicon-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and five conditions—(A) annealed, (F) as fabricated, (PT) Extruded and aged, (W) quenched, and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-351b; 1943. Aluminum-Alloy (A1-17) (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, tolerances; exact lengths, standard lengths, mill lengths, and random lengths; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-354a; 1943. Aluminum-Alloy (A1-24) (Aluminum-Copper-Magnesium (1.50 Percent)-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-356b; 1942. Aluminum-Alloy (A1-3) (Aluminum-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and four conditions for wire—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters hard, and (H) hard; and two conditions for rolled, cold-finished, and extruded bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, sampling, inspection, test, packing, and marking.

U. S. Gov., Federal Specification QQ-A-411b; 1942. Aluminum (A1-2); Bars, Rods, Shapes, and Wire. Covers one grade and four conditions for wire—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters hard, and (H) hard; and two conditions for bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, sampling, inspection, tests, packing, and marking.

U. S. Gov., Navy Dept. Specification 46A3e; 1941. Aluminum (AL-2); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A4g; 1941. Aluminum Alloy (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A6e; 1939. Aluminum Alloy (Aluminum-Manganese); Bars, Rods, Shapes, and Wire (Al-3).

U. S. Gov., Navy Dept. Specification 46A9e; 1942. Aluminum-Alloy (AL-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A10c; 1944. Aluminum-Alloy, Aluminum-Magnesium-Silicon-Chromium; Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A11a; 1945. Aluminum Alloy, Aluminum-Magnesium-Chromium; Bars, Rods, and Wire.

References.—Aluminum alloy bars, *see* 631.1.

631.2 ALUMINUM PLATES, SHEETS, SHAPES, AND STRIPS

631.21 Plates, Aluminum

American Society for Testing Materials, B 25-44T; 1944. Society of Automotive Engineers Specification No. 25. Tentative Specifications for Aluminum Sheet and Plate. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B 78-44T; 1944. Society of Automotive Engineers Specification No. 26. Tentative Specifications for Aluminum-Alloy (Duralumin) Sheet and Plate (Aluminum-Copper-Magnesium-Manganese). Manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, physical and bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B 79-44T; 1944. Society of Automotive Engineers Specification No. 29. Tentative Specifications for Aluminum-Manganese Alloy Sheet and Plate. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B109-44T; 1944. Society of Automotive Engineers Specification No. 201. Tentative Specifications for Aluminum-Magnesium-Chromium Alloy Sheet and Plate. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, rejection, and explanatory notes.

American Society for Testing Materials, B 126-44T; 1944. A.S.M.E. Boiler Construction Code Specification SB-126. Tentative Specifications for Aluminum-Manganese Alloy Sheet and Plate for Use in Welded Pressure Vessels. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B 178-44T; 1944. A.S.M.E. Boiler Construction Code Specification SB-178. Tentative Specifications for Aluminum Sheet and Plate for Use in Welded Pressure Vessels. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers, Aeronautical Material Specification 4030B; 1944. Aluminum Alloy Sheet and Plate, Copper Manganese Magnesium (17S-O). Gives requirements for composition, condition, physical properties, quality, tolerances, reports, identification, and rejections. Similar specifications: Navy 47A3, condition A; Federal QQ-A-353, condition A; SAE 26, temper annealed; ASTM B78-42T, annealed; Alloy 17S-O.

Society of Automotive Engineers. Aeronautical Material Specification 4032B; 1944. Aluminum Alloy Sheet and Plate, Copper Manganese Magnesium (17S-T). Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections. Similar specifications; Navy 47A3, condition T; Federal QQ-A-353, condition T; SAE 26, temper T; ASTM B78-42T, heat treated; Alloy 17S-T.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-9; 1943. Aluminum Alloy (AL-XA75); Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-12-1; 1943. Aluminum Alloy (AL-24); Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-13-2; 1944. Aluminum Alloy, Clad, (AL-24C2); Plate, sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-22; 1944. Aluminum Alloy (4.5 Copper, 1.0 Silicon, Manganese, Magnesium); Clad, Plate, and Sheet.

U. S. Gov., Federal Specification QQ-A-318; 1938. Aluminum-Alloy (Al-52) (Aluminum-Magnesium-Chromium); Plates, Sheets, and Strips. Covers one grade and three types—(I) flat sheet (commercial finish and gray finish), (II) strip sheet (strip sheet finish), and (III) plate (plate finish); and six tempers—(I) soft (1/4 H) quarter-hard, (1/2 H) half-hard, (3/4 H) three-quarters hard, (H) hard, and (F) as rolled. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, thickness, width, length, sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-327; 1941. Aluminum-Alloy (Al-61) (Aluminum-Magnesium-Silicon); Plates, Sheets, and Strips. Covers one grade and three conditions—(A) annealed, (W) quenched, and (T) heat-treated and aged. Gives requirements for material, chemical composition, mechanical properties, tolerances, random stock sizes, and lateral bow tolerances; sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-334; 1936. Aluminum-Alloy (Aluminum-Chromium-Magnesium-Silicon); Plates and Sheets. Covers one grade and three conditions—(A) annealed, (W) quenched, and (T) heat-treated and aged. Gives requirements for material, chemical composition, mechanical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-353a; 1939. Aluminum-Alloy (Al-17) (Aluminum-Copper-Magnesium-Manganese); Plates, Sheets, and Strips. Covers one grade and three conditions—(A) annealed, (T) heat-treated, and (TR) rolled after heat-treating. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-355a; 1941. Aluminum Alloy (Al-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Plates, Sheets, and Strips. Covers one grade and four conditions—(A) annealed, (T) heat-treated, (TR) rolled after heat-treating, and (F) as fabricated (strip). Gives requirements for material, workmanship, chemical composition, mechanical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-359a; 1942. Aluminum-Alloy (Al-3) (Aluminum-Manganese); Plates and Sheets. Covers one grade and three types—(1) flat sheet (commercial bright finish and gray finish), (2) coiled sheet (coiled sheet finish), and (3) plate (plate finish); four conditions for types 1 and 2—(A) soft, (1/2 H) half-hard. (3/4 H) three-quarters-hard, and (H) hard; and one condition for type 3—as rolled. Gives requirements for material, workmanship, chemical composition, physical properties, bending test, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-361; 1941. Amendment 2; 1943. Aluminum-Alloy (Aluminum-Surfaced) (AL-17C2), (Aluminum-Copper-Magnesium-Manganese); Plates, Sheets, and Strips. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, cladding thickness, chemical composition, mechanical properties, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-A-362; 1941. Amendment 2; 1943. Aluminum-Alloy (Aluminum-Surfaced) (AL-24C2), (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Plates, Sheets, and Strips. Covers one grade and three conditions—(A) annealed, (T) heat-treated, and (TR) rolled after heat-treating. Gives requirements for material, workmanship, cladding thickness, chemical composition, mechanical properties, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-A-561; 1933. Aluminum; Plates and Sheets. Covers one grade and three types—(1) flat sheet (commercial bright finish and gray finish), (2) coiled sheet (coiled sheet finish), and (3) plate (plate finish); four tempers for types 1 and 2—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters-hard, and (H) hard; and one temper for type 3—as rolled. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, methods of sampling, physical tests, packing, and marking.

U. S. Gov., Navy Dept. Specification 47A2e; 1944. Aluminum; Plates, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 47A3c; 1939. Aluminum Alloy (Aluminum-Copper-Magnesium-Manganese); Plate, Sheet, and Strip.

U. S. Gov., Navy Dept. Specification 47A4d; 1944. Aluminum-Alloy (Al-3) (Aluminum-Manganese); Plates, Sheets (Flat and Coiled), and Strips.

U. S. Gov., Navy Dept. Specification 47A7; 1933. Aluminum Alloy (Aluminum-Manganese); Plate, Floor, Rolled.

U. S. Gov., Navy Dept. Specification 47A10e; 1942. Aluminum Alloy (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Plate, Sheet, and Strip (AL-24).

U. S. Gov., Navy Dept. Specification 47A11c; 1944. Aluminum Alloy, Aluminum-Magnesium-Chromium; Plate, Sheet, and Strip.

U. S. Gov., Navy Dept. Specification 47A12a; 1936. Aluminum Alloy (Aluminum-Magnesium-Silicon-Chromium); Plates and Sheets.

References.—Aluminum alloy plates, *see* 631.11; methods of testing, general requirements for metals, *see* 600.1, 631.0.

631.22 Shapes, Aluminum

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 169; 1944. Rolled Formed Sections; Aluminum Alloy. Gives composition and condition, material and workmanship, and detail requirements; method of sampling, inspection, and tests; and packing and marking for shipment. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 180; 1943. Angles; Equal Leg, Rolled form Aluminum Alloy. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Society of Automotive Engineers. Aeronautical Material Specification No.4150; 1944. Aluminum Alloy, Magnesium Silicon Copper (61ST); Extruded. For rods, bars, or shapes. Covers composition, condition, quality, tolerances, reports, identification, and rejections. Similar Specification: Alloy 61S-T.

Society of Automotive Engineers. 1944 Handbook, Section 1—Aeronautical Parts, Materials, and Codes. S.A.E. Recommended Practice for Aluminum Alloy Extruded Structural Shapes for Aircraft, adopted 1931. Diagrams of shapes with tables of sizes, dimensions, area, moments of inertia, section moduli, weight per foot, and radii of gyration for unequal angles, bulb angles, shallow channels, deep channels, bulb channels, tees, and zees.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-8; 1943. Aluminum Alloy (AL-14); Extruded Shapes.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-11a-1943. Aluminum Alloy (AL-XB75): Extruded Shapes.

U. S. Gov., Federal Specification QQ-A-315; 1943. Aluminum Alloy (Al-52) (Aluminum-Magnesium-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and following conditions: Wire—(A) soft, (1/2H) half-hard, (3/4H) three-quarters-hard, and (H) hard; and bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, and lengths; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Federal Specification QQ-A-325; 1944. Aluminum-Alloy (AL-61) (Aluminum-Magnesium-Silicon-Copper-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and three conditions—(A) annealed, (B) quenched, and (C) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, various lengths, tolerances, and marking; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-331b; 1942. Aluminum-Alloy (Al-53) (Aluminum-Magnesium-Silicon-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and five conditions—(A) annealed, (F) as fabricated, (PT) extruded and aged, (W) quenched, and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-351b; 1943. Aluminum-Alloy (Al-17) (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, tolerances; exact lengths, standard lengths, mill lengths, and random lengths; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-354a; 1943. Aluminum-Alloy (Al-24) (Aluminum-Copper-Magnesium (1.50 Percent)-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-356b; 1942. Aluminum-Alloy (Al-3) (Aluminum-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and four conditions for wire—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters hard, and (H) hard; and two conditions for rolled, cold-finished, and extruded bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-411b; 1942. Aluminum (Al-2); Bars, Rods, Shapes, and Wire. Covers one grade and four conditions for wire—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters hard, and (H) hard; and two conditions for bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, sampling, inspection, tests, packing, and marking.

U. S. Gov., Navy Dept. Specification 46A3e; 1941. Aluminum (AL-2); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A4g; 1941. Aluminum Alloy (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A6e; 1939. Aluminum Alloy (Aluminum-Manganese); Bars, Rods, Shapes, and Wire (Al-3).

U. S. Gov., Navy Dept. Specification 46A9e; 1942. Aluminum-Alloy (AL-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A10c; 1944. Aluminum-Alloy, Aluminum-Magnesium-Silicon-Chromium; Bars, Rods, Shapes, and Wire.

References.—Aluminum alloy, *see* 631.11; methods of testing, general requirements for metals, *see* 600.1, 631.0.

631.23 Sheets, Aluminum

American Society for Testing Materials, B 25-44T; 1944. Society of Automotive Engineers Specification No.25. Tentative Specifications for Aluminum Sheet and Plate. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis.

temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B 78-44 T; 1944. Society of Automotive Engineers Specification No. 26. Tentative Specifications for Aluminum-Alloy (Duralumin) Sheet and Plate (Aluminum-Copper-Mangnesium-Manganese). Manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, physical and bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B 79-44T; 1944. Society of Automotive Engineers Specification No. 29. Tentative Specifications for Aluminum-Manganese Alloy Sheet and Plate. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B 109-44T; 1944. Society of Automotive Engineers Specification No. 201. Tentative Specifications for Aluminum-Magnesium-Chromium Alloy Sheet and Plate. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, rejection, and explanatory notes.

American Society for Testing Materials, B 126-44T; 1944. A.S.M.E. Boiler Construction Code Specification SB-126. Tentative Specifications for Aluminum-Manganese Alloy Sheet and Plate for Use in Welded Pressure Vessels. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis; methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B 178-44T; 1944. A.S.M.E. Boiler Construction Code Specification SB-178. Tentative Specifications for Aluminum Sheet and Plate for Use in Welded Pressure Vessels. Gives requirements for manufacture, chemical composition, chemical analysis, sampling for chemical analysis, methods of chemical analysis, temper and tensile properties, bending properties, test specimens, number of tests, methods of testing, permissible variations in thickness, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4000; 1940. Aluminum Sheet (Annealed). Gives requirements as to composition (99.7 percent aluminum minimum), condition (fully annealed), tensile strength, (12,000 lbs. per square inch maximum), quality, and thickness tolerances.

Society of Automotive Engineers. Aeronautical Material Specification 4001; 1943. Aluminum Sheet and Strip (2S-0). Covers composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specifications 4003; 1940. Aluminum Sheet, 1/2 Hard (Alloy 52S-1/2 H). Gives requirements for composition (99.0 percent aluminum minimum), condition (half-hard), tensile strength (16,000 lbs. per square inch minimum), elongation, quality, tolerances, reports, finished parts, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4006; 1941. Aluminum Alloy Sheet and Strip, Manganese (3S-0). Covers composition, condition, thickness, tensile strength, elongation, quality, tolerance, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4008; 1941. Aluminum Alloy Sheet and Strip, Manganese (3S-1/2 H). Covers composition, condition, thickness, tensile strength, elongation, quality, tolerance, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4015A; 1942. Aluminum Alloy Sheet and Strip, Magnesium Chromium (52S-0). Covers requirements for composition, condition (annealed), thickness, tensile strength, elongation, quality, tolerances, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4016A; 1942. Aluminum Alloy Sheet and Strip, Magnesium Chromium (52S-1/4H). Gives requirements for composition, condition (Quarter-hard), thickness, tensile strength, elongation, bend factor, quality, tolerances, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4017A; 1942. Aluminum Alloy Sheet and Strip, Magnesium Chromium (52S-1/2H). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4025; 1942 Aluminum Alloy Sheet and Strip, Magnesium Silicon Copper (61S-0). Gives requirements for composition, condition, physical properties, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4026; 1942. Aluminum Alloy Sheet and Strip, Magnesium Silicon Copper (61S-W). Gives requirements for composition, condition, physical properties, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4027; 1942. Aluminum Alloy Sheet and Strip, Magnesium Silicon Copper (61S-T). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4030B; 1944. Aluminum Alloy

Sheet and Plate, Copper Manganese Magnesium (17S-0). Gives requirements for composition, condition, physical properties, quality, tolerances, reports, identification, and rejections. Similar Specifications: Navy 47A3, condition A; Federal QQ-A-353, condition A; SAE 26, temper annealed; ASTM B78-42T, annealed; Alloy 17S-0.

Society of Automotive Engineers. Aeronautical Material Specification 4032B; 1944. Aluminum Alloy Sheet and Plate, Copper Manganese Magnesium (17S-T). Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejections. Similar specifications: Navy 47A3, condition T; Federal QQ-A-353, condition T; SAE 26, temper T; ASTM B78-42T, heat treated; Alloy 17S-T.

Society of Automotive Engineers. Aeronautical Material Specification 4035A; 1942. Aluminum Alloy Sheet and Strip, Copper Magnesium Manganese (24S-0). Gives requirements for composition, condition (annealed), thickness, tensile strength, elongation, bend factor, quality, tolerance, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4037A; 1942. Aluminum Alloy, Sheet and Strip, Copper Magnesium Manganese (24S-T). Gives requirements for composition, condition (heat treated), tensile strength, yield strength, elongation, bend factor, quality, tolerances, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4040A; 1942. Aluminum Alloy Sheet and Strip, Aluminum-Covered Copper Magnesium Manganese (ALC 24S-0). Gives requirements for composition, condition (annealed), thickness, tensile strength, elongation, bend factor, quality, tolerances, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4041A; 1942. Aluminum Alloy Sheet and Strip, Aluminum-Covered Copper Magnesium Manganese (ALC 24S-T). Gives requirements for composition, condition (heat treated), thickness, tensile strength, yield strength, elongation, bend factor, quality, tolerances, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4042A; 1942. Aluminum Alloy, Sheet and Strip, Aluminum-Covered Copper Magnesium Manganese (ALC 24S-RT). Gives requirements for composition, condition (heat treated), thickness, tensile strength, yield strength, elongation, bend factor, quality, tolerances, identification, and rejection.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

U. S. Gov., Army Air Forces. Specification 11077; 1936. Aluminum and Aluminum Alloy; Corrugated Sheet.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-9; 1943. Aluminum Alloy (AL-XA75); Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-10a; 1943. Aluminum Alloy, Clad (AL-XB75C2), Sheet and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-12-1; 1943. Aluminum Alloy (AL-24); Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-13-2; 1944. Aluminum Alloy, Clad (AL-24C2); Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-22; 1944. Aluminum Alloy (4.5 Copper, 1.0 Silicon, Manganese, Magnesium); Clad, Plate, and Sheet.

U. S. Gov., Federal Specification QQ-A-318; 1938. Aluminum-Alloy (Al-52) (Aluminum-Magnesium-Chromium); Plates, Sheets, and Strips. Covers one grade and three types—(I) flat sheet (commercial finish and gray finish), (II) strip sheet (strip sheet finish), and (III) plate (plate finish); and six tempers—(A) soft, (1/4 H) quarter-hard, (1/2 H) half-hard, (3/4 H) three-quarters-hard, (H) hard, and (F) as rolled. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, thickness, width, length, sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-327; 1941. Aluminum-Alloy (Al-61) (Aluminum-Magnesium-Silicon); Plates, Sheets, and Strips. Covers one grade and three conditions—(A) annealed, (W) quenched, and (T) heat-treated and aged. Gives requirements for material, chemical composition, mechanical properties, tolerances, random stock sizes, and lateral bow tolerances; sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-334; 1936. Aluminum-Alloy (Aluminum-Chromium-Magnesium-Silicon); Plates and Sheets. Covers one grade and three conditions—(A) annealed, (W) quenched, and (T) heat-treated and aged. Gives requirements for material, chemical composition, mechanical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-353a; 1939. Aluminum-Alloy (Al-17) (Aluminum-Copper-Magnesium-Manganese); Plates, Sheets, and Strips. Covers one grade and three conditions—(A) annealed, (T) heat-treated, and (TR) rolled after heat-treating. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-355a; 1941. Aluminum-Alloy (Al-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Plates, Sheets, and Strips. Covers one grade and four conditions—(A) annealed, (T) heat-treated, (TR) rolled after heat-treating, and (F) as fabricated (strip). Gives requirements for material, workmanship, chemical composition, mechanical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-359a; 1942. Aluminum-Alloy (Al-3) (Aluminum-Manganese); Plates and Sheets. Covers one grade and three types—(1) flat sheet (commercial bright finish and gray finish), (2) coiled sheet (coiled sheet finish), and (3) plate (plate finish); four conditions for types 1 and 2—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters-hard, and (H) hard; and one condition for type 3—as rolled. Gives requirements for material, workmanship, chemical composition, physical properties, bending test, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-361; 1941. Amendment 2; 1943. Aluminum-Alloy (Aluminum-Surfaced) (AL-17C2), (Aluminum-Copper-Magnesium-Manganese); Plates, Sheets, and Strips. Covers one grade and two conditions—(A) annealed, and (T) heat-treated. Gives requirements for material, workmanship, cladding thickness, chemical composition, mechanical properties, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-A-362; 1941. Amendment 2; 1943. Aluminum-Alloy (Aluminum-Surfaced) (AL-24C2), (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Plates, Sheets, and Strips. Covers one grade and three conditions—(A) annealed, (T) heat-treated, and (TR) rolled after heat-treating. Gives requirements for material, workmanship, cladding thickness, chemical composition, mechanical properties, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-A-561; 1933. Aluminum; Plates and Sheets. Covers one grade and three types—(1) flat sheet (commercial bright finish and gray finish), (2) coiled sheet (coiled sheet finish), and (3) plate (plate finish); four tempers for types 1 and 2—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters-hard, and (H) hard; and one temper for type 3—as rolled. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, methods of sampling, physical tests, packing, and marking.

U. S. Gov., Navy Dept. Specification 47A2e; 1944. Aluminum; Plates, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 47A3c; 1939. Aluminum Alloy (Aluminum-Copper-Magnesium-Manganese); Plate, Sheet, and Strip.

U. S. Gov., Navy Dept. Specification 47A4d; 1944. Aluminum-Alloy (Al-3) (Aluminum-Manganese); Plates, Sheets (Flat and Coiled), and Strips.

U. S. Gov., Navy Dept. Specification 47A10e; 1942. Aluminum Alloy (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Plate, Sheet, and Strip (AL-24).

U. S. Gov., Navy Dept. Specification 47A11c; 1944. Aluminum Alloy, Aluminum-Magnesium-Chromium; Plate, Sheet, and Strip.

U. S. Gov., Navy Dept. Specification 47A12a; 1936. Aluminum Alloy (Aluminum-Magnesium-Silicon-Chromium); Plates and Sheets.

References.—Other aluminum alloy sheet, *see* 631.11; methods of testing, general requirements for metals, *see* 600.1, 631.0: heat treatments, *see* 600.5; standard gage and thicknesses for sheets, *see* 631.21.

631.24 Strips, Aluminum

Society of Automotive Engineers. Aeronautical Material Specification 4001; 1943. Aluminum Sheet and Strip (2S-0). Covers composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4006; 1941. Aluminum Alloy Sheet and Strip, Manganese (3S-0). Covers composition, condition, thickness, tensile strength, elongation, quality, tolerance, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4008; 1941. Aluminum Alloy Sheet and Strip, Manganese (3S-1/2 H). Covers composition, condition, thickness, tensile strength, elongation, quality, tolerance, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4017A; 1942. Aluminum Alloy Sheet and Strip, Magnesium Chromium (52S-1/2H). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4025; 1942. Aluminum Alloy Sheet and Strip, Magnesium Silicon Copper (61S-0). Gives requirements for composition, condition, physical properties, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4026; 1942. Aluminum Alloy Sheet and Strip, Magnesium Silicon Copper (61S-W). Gives requirements for composition, condition, physical properties, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4027; 1942. Aluminum Alloy Sheet and Strip, Magnesium Silicon Copper (61S-T). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4040A; 1942. Aluminum Alloy Sheet and Strip, Aluminum-Covered Copper Magnesium Manganese (ALC 24S-0). Gives requirements for composition, condition (annealed), thickness, tensile strength, elongation, bend factor, quality, tolerances, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4041A; 1942. Aluminum Alloy Sheet and Strip, Aluminum-Covered Copper Magnesium Manganese (ALC 24S-T). Gives requirements for composition, condition (heat treated), thickness, tensile strength, yield strength, elongation; bend factor, quality, tolerances, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4042A; 1942. Aluminum Alloy Sheet and Strip, Aluminum-Covered Copper Magnesium Manganese (ALC 24S-RT). Gives requirements for composition, condition (heat treated), thickness, tensile strength, yield strength, elongation, bend factor, quality, tolerances, identification, and rejection.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-9; 1943. Aluminum Alloy (AL-XA75); Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-10a; 1943. Aluminum Alloy, Clad (AL-XB75C2), Sheet and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-12-1; 1943. Aluminum Alloy (AL-24); Plate, Sheet, and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-13-2; 1944. Aluminum Alloy, Clad (AL-24C2); Plate, Sheet, and Strip.

U. S. Gov., Federal Specification QQ-A-318; 1938. Aluminum-Alloy (AL-52) (Aluminum-Magnesium-Chromium); Plates, Sheets, and Strips. Covers one grade and three types—(I) flat sheet (commercial finish and gray finish), (II) strip sheet (strip sheet finish), and (III) plate (plate finish); and six tempers—(A) soft, (1/4 H) quarter-hard, (1/2 H) half-hard, (3/4 H) three-quarters-hard, (H) hard, and (F) as rolled. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, thickness, width, length, sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-327; 1941. Aluminum-Alloy (AL-61) (Aluminum-Magnesium-Silicon); Plates, Sheets, and Strips. Covers one grade and three conditions—(A) annealed, (W) quenched, and (T) heat-treated and aged. Gives requirements for material, chemical composition, mechanical properties, tolerances, random stock sizes, and lateral bow tolerances; sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-353a; 1939. Aluminum-Alloy (AL-17) (Aluminum-Copper-Magnesium-Manganese); Plates, Sheets, and Strips. Covers one grade and three conditions— (A) annealed, (T) heat-treated, and (TR) rolled after heat-treating. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-355a; 1941. Aluminum-Alloy (AL-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Plates, Sheets, and Strips. Covers one grade and four conditions—(A) annealed, (T) heat-treated, (TR) rolled after heat-treating, and (F) as fabricated (strip). Gives requirements for material, workmanship, chemical composition, mechanical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-361; 1941. Amendment 2; 1943. Aluminum-Alloy (Aluminum-Surfaced) (AL-17C2), (Aluminum-Copper-Magnesium-Manganese); Plates, Sheets, and Strips. Covers one grade and two conditions—(A) annealed, and (T) heat-treated. Gives requirements for material, workmanship, cladding thickness, chemical composition, mechanical properties, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-A-362; 1941. Amendment 2; 1943. Aluminum-Alloy (Aluminum-Surfaced)(AL-24C2), (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Plates, Sheets, and Strips. Covers one grade and three conditions—(A) annealed, (T) heat-treated, (TR) rolled after heat-treating. Gives requirements for material, workmanship, cladding thickness, chemical composition, mechanical properties, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 47A2e; 1944. Aluminum; Plates, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 47A3c; 1939. Aluminum Alloy (Aluminum-Copper-Magnesium-Manganese); Plate, Sheet, and Strip (AL-17).

U. S. Gov., Navy Dept. Specification 47A10e; 1942. Aluminum Alloy (Aluminum-Copper-Magnesium(1.5 Percent)-Manganese); Plate, Sheet, and Strip (AL-24).

U. S. Gov., Navy Dept. Specification 47A11c; 1944. Aluminum Alloy, Aluminum-Magnesium-Chromium; Plate, Sheet, and Strip.

References.—Aluminum alloy strips, *see* 631.11; methods of testing, general requirements for metals, *see* 600.1, 631.0; standard gage and thicknesses for strip, *see* 631.21.

631.3 ALUMINUM RODS, WIRES, AND RIVETS

631.31 Rods, Aluminum

Society of Automotive Engineers. Aeronautical Material Specification No.4150; 1944. Aluminum Alloy, Magnesium Silicon Copper (61ST); Extruded. For rods, bars, or shapes. Covers composition, condition, quality, tolerances, reports, identification, and rejections. Similar Specification: Alloy 61S-T.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

U. S. Gov., Army Air Forces. Specification 11330-A-1; 1944. Bars and Rods; Aluminum Alloy, 11S, Free Machining.

U. S. Gov., Federal Specification QQ-A-315; 1943. Aluminum Alloy (AL-52) (Aluminum-Magnesium-Chromium): Bars, Rods, Shapes, and Wire. Covers one grade and following conditions: Wire—(A) soft, (1/2H) half-hard, (3/4H) three-quarters-hard, and (H) hard; and bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, and lengths; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Federal Specification QQ-A-325; 1944. Aluminum-Alloy (AL-61) (Aluminum-Magnesium-Silicon-Copper-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and three conditions—(A) annealed, (B) quenched, and (C) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, various lengths, tolerances, and marking; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-331b; 1942. Aluminum-Alloy (Al-53) (Aluminum-Magnesium-Silicon-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and five conditions—(A) annealed, (F) as fabricated, (PT) extruded and aged, (W) quenched, and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-351b; 1943. Aluminum-Alloy (Al-17) (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, tolerances; exact lengths, standard lengths, mill lengths, and random lengths; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-354a; 1943. Aluminum-Alloy (Al-24) (Aluminum-Copper-Magnesium (1.50 Percent)-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-356b; 1942. Aluminum-Alloy (Al-3) (Aluminum-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and four conditions for wire—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters-hard, and (H) hard; and two conditions for rolled, cold-finished, and extruded bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-411b; 1942. Aluminum (Al-2); Bars, Rods, Shapes, and Wire. Covers one grade and four conditions for wire—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters-hard, and (H) hard; and two conditions for bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-R-571; 1932. Rods; Welding, Nonferrous (for) Gas Welding. Includes type D, aluminum; and type E, aluminum alloy. Gives requirements for chemical composition, weldability, character of weld metal, physical properties, sizes, and lengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 46A3e; 1941. Aluminum (AL-2); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A4g; 1941. Aluminum Alloy (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A6e; 1939. Aluminum Alloy (Aluminum-Manganese); Bars, Rods, Shapes, and Wire (Al-3).

U. S. Gov., Navy Dept. Specification 46A9e; 1942. Aluminum-Alloy (AL-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A10c; 1944. Aluminum-Alloy, Aluminum-Magnesium-Silicon-Chromium; Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A11a; 1945. Aluminum Alloy, Aluminum-Magnesium-Chromium; Bars, Rods, and Wire.

U. S. Gov., Navy Dept. Specification 46R1b; 1933. Rods; Welding, Nonferrous (for Gas Welding).

References.—Other aluminum alloy rods, *see* 631.11; welding apparatus and procedure, *see* 787; methods of testing, general requirements for metals, *see* 600.1, 631.0.

631.32 Wires, Aluminum

American Institute of Electrical Engineers. Standard No. 46; 1927. American Standards Assn., C 11-1927. Hard Drawn Aluminum Conductors. Covers the electrical and related properties. Gives normal values for resistivity, resistance-temperature coefficient, density, length-temperature coefficient, change in resistivity with change in temperature, and gives explanatory notes.

American Society for Testing Materials, B 184-43T; 1943. Tentative Specifications for Aluminum and Aluminum-Alloy Metal Arc-Welding Electrodes. These specifications cover coated or covered metal arc-welding electrodes for welding aluminum and aluminum alloys. Gives requirements for manufacture, standard sizes and lengths, chemical composition, weld tests, preparation of test specimens, tension and bend test procedures, test results required, permissible variations in dimensions, electrode coverings, workmanship, packing, marking, and guarantee. This specification prepared jointly by A.S.T.M. and American Welding Society.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Wire; Aluminum. Covers definition, properties, specifications, and uses.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-W-298-2; 1943. Wire; Aluminum and Aluminum Alloy (for Rivets).

U. S. Gov., Federal Specification QQ-A-315; 1943. Aluminum Alloy (Al-52) (Aluminum-Magnesium-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and following conditions: Wire—(A) soft, (1/2H) half-hard, (3/4H) three-quarters-hard, and (H) hard; and bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, and lengths; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Federal Specification QQ-A-325; 1944. Aluminum-Alloy (AL-61) (Aluminum-Magnesium-Silicon-Copper-Chromium): Bars, Rods, Shapes, and Wire. Covers one grade and three conditions—(A) annealed, (B) quenched, and (C) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, various lengths, tolerances, and marking; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-331b; 1942. Aluminum-Alloy (Al-53) (Aluminum-Magnesium-Silicon-Chromium); Bars, Rods, Shapes, and Wire. Covers one grade and five conditions—(A) annealed, (F) as fabricated, (PT) extruded and aged, (W) quenched, and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-351b; 1943. Aluminum-Alloy (Al-17) (Aluminum-Copper-Magnesium-Manganese);. Bars, Rods, Shapes, and Wire. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, tolerances; exact lengths, standard lengths, mill lengths, and random lengths; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification QQ-A-354a; 1943. Aluminum-Alloy (Al-24) (Aluminum-Copper-Magnesium (1.50 Percent)-Manganese; Bars, Rods, Shapes, and Wire. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-356b; 1942. Aluminum-Alloy (Al-3) (Aluminum-Manganese); Bars, Rods, Shapes, and Wire. Covers one grade and four conditions for wire—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters-hard, and (H) hard; and two conditions for rolled, cold-finished, and extruded bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-411b; 1942. Aluminum (Al-2); Bars, Rods, Shapes, and Wire. Covers one grade and four conditions for wire—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters-hard, and (H) hard; and two conditions for bars, rods, and shapes—(A) soft and (F) as fabricated. Gives requirements for material, workmanship, chemical composition, physical properties, permissible variations, lengths, sampling, inspection, tests, packing, and marking.

U. S. Gov., Navy Dept. Specification 46A3e; 1941. Aluminum (AL-2); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A4g; 1941. Wire; Aluminum-Alloy (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, and Shapes.

U. S. Gov., Navy Dept. Specification 46A6e; 1939. Aluminum-Alloy (Aluminum-Manganese); Bars, Rods, Shapes, and Wire (Al-3).

U. S. Gov., Navy Dept. Specification 46A9e; 1942. Aluminum-Alloy (AL-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese); Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A10c; 1944. Aluminum-Alloy, Aluminum-Magnesium-Silicon-Chromium; Bars, Rods, Shapes, and Wire.

U. S. Gov., Navy Dept. Specification 46A11a; 1945. Aluminum Alloy, Aluminum-Magnesium-Chromium; Bars, Rods, and Wire.

References.—Aluminum welding wire, *see* 631.31; electric cables and wire of copper, *see* 715.41, 715.44; methods of testing, general requirements for metals, *see* 600.1, 631.0; aluminum alloys in form of wire, *see* 631.11.

631.33 Rivets, Aluminum

Society of Automotive Engineers. Aeronautical Material Specification 7220A; 1944. Rivets; Aluminum (2S-1/2H). Covers composition, condition, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 7222A; 1944. Rivets; Aluminum Alloy (A17S-T). Covers composition, condition, quality, reports, identification, and rejections.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-19-1; 1945. Rivets; Aluminum and Aluminum Alloy.

U. S. Gov., Navy Dept. Specification 43R5g; 1944. Rivets (and Rods and Wire, Rivet); Aluminum and Aluminum-Alloy.

631.34 Screws, Aluminum

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 12; 1941. Screws; Nonlosable, Aluminum Alloy, Nos. 8-32 and 10-32. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

631.35 Bolts, Aluminum

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 53, 54, 55, 56, 57, 58, 59, 60, 62, 64, and 66; 1944. Bolt; Close Tolerance, Alloy Steel and Aluminum Alloy. Nos. 10-32, 1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, 9/16-18, 5/8-18, 3/4-16, 7/8-14, and 1-14. Gives drawings with dimensions and notes for size. Developed by National Aircraft Standard Committee.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-3a; 1943. Bolts; Aircraft.

631.4 ALUMINUM CASTINGS AND TUBES

631.40 General Items

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-72-3; 1927. Aluminum Castings; Treatment With Sodium Silicate (Water Glass).

631.41 Castings, Aluminum

American Society for Testing Materials, B 26-44T; 1944. Tentative Specifications for Aluminum-Base Alloy Sand Castings. Covers 11 aluminum-base alloy sand castings having a specific gravity of 3 or less. Gives requirements for manufacture, chemical composition, sampling for chemical analysis, method of chemical analysis, tensile properties, tension tests, test specimens, number of tests, retests, work anship and finish, inspection, and rejection.

American Society for Testing Materials, B85-44T; 1944. Tentative Specifications for Aluminum-Base Alloy Die Castings. Covers eight alloy compositions; requirements for chemical analysis, sampling, density, workmanship, permissible variations, physical properties, and tests.

American Society for Testing Materials, B 108-44T; 1944. Tentative Specifications for Aluminum-Base Alloy Permanent Mold Castings. Covers 10 aluminum-base alloy permanent mold castings having a specific gravity of 3 or less. Gives requirements for classes, chemical composition, sampling for chemical analysis, method of chemical analysis, tensile properties and tests, test specimens, number of tests, retests, workmanship and finish, inspection, rejection, rehearing, and table of principal uses and characteristics of the 10 designated alloys.

American Society for Testing Materials, ES-29; 1943. Emergency Specifications for Special Quality, Aluminum-Base Alloy Castings. Covers controlled quality, aluminum-base alloy pressure-molded castings for applications where breakdown would mean serious interruption of important operations, danger to life, or failure to consummate critical objectives. Gives manufacture, detail drawings, chemical composition, chemical analysis, sample castings, production control, marking, and records.

Society of Automotive Engineers. Aeronautical Material Specification 4210B; 1942. Aluminum Alloy Castings (Sand); 5 Percent Silicon (Aged). Gives requirements for composition, casting, heat treatment, test bars, quality, precautions, reports, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4212B; 1942. Aluminum Alloy Castings (Sand); 5 Percent Silicon (Solution and Precipitation). Gives requirements for composition, casting, heat treatment, text bars, quality, precautions, reports, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4214A; 1942. Aluminum Alloy Castings (Sand); 5 Percent Silicon (Solution and Overaged). Gives requirements for composition, castings, heat treatment, test bars, quality, precautions, reports, identification, approval, and rejections. Similar specifications: S.A.E. 322; Alloy 355-T71.

Society of Automotive Engineers. Aeronautical Material Specification No. 4217; 1942. Aluminum Alloy Castings (Sand); 7 Percent Silicon (356-T6). Gives requirements for composition, casting, heat treatment, test bars, quality, precautions, report, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4220A; 1942. Aluminum Alloy Castings (Sand); Copper Nickel Magnesium. Primarily for air-cooled cylinder heads. Gives requirements for composition, casting, heat treatment, hardness, test bars, quality, reports, identification, approval, and rejections.

Society for Automotive Engineers. Aeronautical Material Specification No. 4222; 1942. Aluminum Alloy Castings (Sand); Copper Nickel Magnesium (Solution and Stabilized). Primarily for air-cooled cylinder heads. Gives requirements for composition, casting, heat treatment, hardness, test bars, quality, reports, identification, approval, and reports.

Society of Automotive Engineers. Aeronautical Material Specification No. 4231; 1942. Cast Aluminum Alloy; 4 Percent Copper (Solution and Precipitation). Gives requirements for composition, casting, heat treatment, test bars, quality, precautions, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification No. 4234; 1943. Aluminum Alloy Castings (Sand); Secondary 4 Percent Copper (Solution and Precipitation). Gives requirements for composition, casting, heat treatment, test bars, quality, precautions, reports, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4240A; 1942. Aluminum Alloy Castings (Sand); 10 Percent Magnesium (220-T4). Gives requirements for composition, casting, test bars, quality, precautions, reports, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4280A; 1943. Aluminum Alloy Castings (Permanent Mold); 5 Percent Silicon (Solution and Overaged). Gives requirements for composition, casting, heat treatment, test bars, quality, precautions, reports, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4282A; 1943. Aluminum Alloy Castings (Permanent Mold); 4 Percent Copper, 2 Percent Silicon (Solution Precipitation). Gives requirements for composition, casting, heat treatment, test bars, quality, precautions, reports, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4284; 1942. Aluminum Alloy Castings (Permanent Mold); 7 Percent Silicon (Solution and Aged). Gives requirements for type, composition, grain size, condition, quality, tolerances, tests, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4290A; 1941. Aluminum Alloy, Die Castings. Gives requirements for composition, quality, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification No. 4291; 1943. Aluminum Alloy Castings (Die); Silicon Copper. Gives requirements for composition, quality, reports, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 4292; 1942. Cast Aluminum Alloy; Pressure Molded (Aluminum Silicon). Gives requirements for composition, condition, test bars, quality, reports, identification, approval, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Casting Alloys, revised 1944. Gives table showing composition of S.A.E. aluminum casting alloys and gives various specifications for permanent mold castings, sand castings, and sand and permanent mold castings.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Die Casting Alloys, revised 1944. Gives reference table of similar specifications for aluminum die castings and general information and mechanical properties for various aluminum castings.

U. S. Gov., Army Air Forces. Specification 11324; 1939. Aluminum-Alloy; Sand Castings.

U. S. Gov., Army Air Forces. Specification 11325 (1); 1940. Aluminum-Alloy; Sand Castings (Aluminum, Copper, Tin, Magnesium, Zinc).

U. S. Gov., Army-Navy Aeronautical Specification AN-A-4; 1942. Aluminum-Alloy; Secondary (S-108) Sand-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-5; 1942. Aluminum-Alloy; Secondary (S-195) Sand-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-17; 1943. Aluminum-Alloy (5-25 Zinc); Sand Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-23; 1944. Aluminum-Alloy; General Specification for Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-366-4; 1943. Aluminum-Alloy; Die Castings (Al-13, Al-13X, Al-85, Al-85X, Al-218).

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-376-2; 1942. Aluminum-Alloy (Al-355); Permanent-Mold-and-Sand-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-379-2; 1942. Aluminum-Alloy (Al-142); Permanent-Mold-and-Sand-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-383-2; 1942. Aluminum-Alloy (Al-B195); Permanent-Mold-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-386-2; 1942. Aluminum-Alloy (Al-A132); Permanent-Mold-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-390-3; 1943. Aluminum-Alloy (Al-195); Sand Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-392-2; 1942. Aluminum-Alloy (Al-220); Sand-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-394-2; 1942. Aluminum-Alloy (Al-356); Sand-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-399-2; 1942. Aluminum-Alloy (Al-212); Sand-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-402-2; 1942. Aluminum-Alloy (Al-214); Sand-Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-405-3; 1942. Aluminum-Alloy (Al-43); Sand-Castings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1940. Standard Samples. Aluminum-Base Casting Alloy, Sample 86a.

U. S. Gov., Federal Specification QQ-A-591; 1939. Amendment 2; 1943. Aluminum-Base-Alloy; Die-Castings. Covers 11 classes. Gives requirements for material, manufacture, workmanship, chemical composition, soundness, physical properties, dimensions, and tolerances; methods of inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-A-596; 1939. Aluminum-Base Alloy; Permanent-Mold Castings. Covers 10 alloys. Gives requirements for material, workmanship, chemical composition, physical properties, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification QQ-A-601; 1928. Amendment 2; 1941. Aluminum-Base-Alloys; Sand-Castings. Covers 12 alloys. Gives requirements for material, workmanship, chemical composition, and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-QQ-A-601; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) gave chemical and physical properties for two additional alloys and stated that the following Federal Specifications form a part of this specification: QQ-I-666, Iron, Malleable, Castings; QQ-S-681, Steel, Castings; QQ-I-652, Iron, Gray, Castings; QQ-C-593, Copper-Silicon-Alloy, Castings; QQ-B-621, Brass, Commercial and Naval, Castings; and QQ-B-671 Bronze-Aluminum, Castings.

U. S. Gov., Navy Dept. Specification 46A14; 1940. Aluminum-Base-Alloy Die Castings.

U. S. Gov., Navy Dept. Specification 46A15; 1940. Aluminum-Base-Alloy Permanent Mold Castings.

U. S. Gov., Navy Dept. Specification 46A1e; 1938. Aluminum Alloy; Castings, Light (Resistant to Salt-Water Corrosion).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-72-6; 1944. Aluminum-Base-Alloy (10 Percent Magnesium) Sand Castings.

References.—Methods of testing, general requirements for metals, *see* 600.1, 631.0; ingot metal for castings, *see* 631.12; other specifications for aluminum castings, *see* specifications of individual commodities made of cast aluminum.

631.42 Tubes, Aluminum

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 115; 1942. Tube-Control, 3/8 O.D. and 1/2 O.D., Aluminum Alloy. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Society of Automotive Engineers. Aeronautical Material Specification No.4062; 1942. Aluminum Tubing (Seamless) (2S-1/2H). Gives requirements for composition, condition, quality, tolerances, identification, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4070B; 1944. Aluminum Alloy Tubing; Magnesium Chromium (52S-0). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4076A; 1942. Aluminum Alloy Tubing; Magnesium Silicon Chromium (53S-W). Gives requirements for composition, condition, physical properties, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4080B; 1944. Aluminum Alloy Tubing; Magnesium Silicon Copper (61S-O). Gives requirements for composition, condition, tensile strength, yield strength, elongation, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4082B; 1943. Aluminum Alloy Tubing; Magnesium Silicon Copper (61S-T). Gives requirements for composition, condition, heat treated (quenched and aged), tensile strength, yield strength, elongation, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4088A; 1942. Aluminum Alloy Tubing; Copper Magnesium Manganese (24S-T). Gives requirements for composition, condition, tensile strength, yield strength, elongation, quality, tolerances, identification, and rejection.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

U. S. Gov., Army Air Forces. Specification 11327 (1); 1940. Tubing; Aluminum Alloy (Aluminum-Magnesium-Silicon-Chromium), Round, Seamless.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-13-2; 1944. Tubing; Aluminum Alloy, Flexible.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-32; 1943. Tubing; Aluminum Alloy (AL-XA75), Seamless, Round.

U. S. Gov., Federal Specification WW-T-783a; 1939. Tubing; Aluminum (Al-2), Round, Seamless. Covers one grade and four tempers—(A) soft, (1/2 H) half-hard, (3/4 H) three-quarters-hard, and (H) hard. Gives requirements for chemical composition, physical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification WW-T-785; 1943. Tubing; Aluminum-Alloy (Al-24) (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese), Round, Seamless. Shall be of one grade; and condition A, annealed, or condition T, heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification WW-T-786a; 1942 Amendment 1; 1942. Tubing; Aluminum-Alloy (Al-17) (Aluminum-Copper, Magnesium-Manganese), Round, Seamless. Covers one grade and two conditions—(A) annealed and (T) heat-treated. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification WW-T-787; 1941. Tubing; Aluminum-Alloy (Al-52) (Aluminum-Magnesium-Chromium), Round, Seamless. Covers one grade in soft condition. Gives requirements for material, workmanship, chemical composition, mechanical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U.S. Gov., Federal Specification WW-T-788a; 1939. Tubing; Aluminum-Alloy (Al-3) (Aluminum-Manganese), Round, Seamless. Covers one grade and four tempers—(A) soft, (B) half-hard, (C) three-quarters-hard, and (D) hard. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Federal Specification WW-T-789; 1941. Tubing; Aluminum-Alloy (AL-61), (Aluminum-Magnesium-Silicon), Round, Seamless. Covers one grade and three conditions—(A) annealed, (W) quenched, and (T) heat-treated and aged. Gives requirements for chemical composition, mechanical properties, tolerances, and permissible variations; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification WW-T-790; 1939. Tubing; Aluminum-Alloy (Al-53) (Aluminum-Magnesium-Silicon-Chromium), Round, Seamless. Covers one grade and three conditions—(A) annealed, (W) quenched, and (T) heat-treated and aged. Gives requirements for material, workmanship, chemical composition, physical properties, tolerances, methods of sampling, inspection, tests, packing, and marking.

U. S. Gov., Navy Dept. Specification 33T3b; 1941. Tubing; Flexible, Aluminum-Alloy and Corrosion-Resisting Steel.

U. S. Gov., Navy Dept. Specification 44T19c; 1944. Tubing; Aluminum (AL-2), Round, Seamless.

U. S. Gov., Navy Dept. Specification 44T20b; 1944. Tubing; Aluminum Alloy (Aluminum-Manganese).

U. S. Gov., Navy Dept. Specification 44T21e; 1944. Tubing; Aluminum-Alloy (AL-17) (Aluminum-Copper-Magnesium-Manganese), Round, Seamless.

U. S. Gov., Navy Dept. Specification 44T22a; 1937. Tubing; Aluminum-Alloy (Aluminum-Copper-Magnesium-Manganese), Streamline (Aircraft Use).

U. S. Gov., Navy Dept. Specification 44T28a; 1937. Tubing; Aluminum-Alloy (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese), Round, Seamless.

U. S. Gov., Navy Dept. Specification 44T30a; 1936. Tubing; Aluminum-Alloy (Aluminum-Magnesium-Silicon-Chromium), Round, Seamless.

U. S. Gov., Navy Dept. Specification 44T31a; 1937. Tubing; Aluminum-Alloy (Aluminum-Copper-Magnesium (1.5 Percent)-Manganese), Streamline (Aircraft Use).

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-187-2B; 1940. Tubing; Streamline, Cross-Section, Aluminum-Alloy.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-195; 1944. Tubing; Flexible, Corrosion-Resistant Steel and Aluminum Alloy.

References.—Aluminum alloys in form of tubes, *see* 631.11.

631.43 Forgings, Aluminum

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Forgings. Covers definition, characteristics, classes of forgings, forgeable metals, and commercial forging practice.

Society of Automotive Engineers. Aeronautical Material Specification 4125B; 1944. Aluminum Alloy

Forgings, Silicon Magnesium Chromium (A51S-T). Gives requirements for composition, condition, quality, reports, identification, and rejections. Similar specifications, Navy 46A7 grade 3; Federal QQ-A-367 Grade 3; SAE 280; and Alloy A51S-T.

Society of Automotive Engineers. Aeronautical Material Specification 4130B; 1944. Aluminum Alloy Forgings, Copper Silicon Manganese (25S-T). Gives requirements for composition, condition, quality, reports, identification, and rejections. Similar specifications, Navy 46A7 Grade 2; Federal QQ-A-367 Grade 2; SAE 27: and Alloy 25S-T.

Society of Automotive Engineers. Aeronautical Material Specification 4135B; 1944. Aluminum Alloy Forgings, Copper Silicon Manganese Magnesium (14S-T). Gives requirements for composition, condition, quality, reports, identification, and rejections. Similar specifications, Navy 46A7 Grade 5; Federal QQ-A-367 Grade 5; and Alloy 14S-T.

Society of Automotive Engineers. Aeronautical Material Specification 4140B; 1944. Aluminum Alloy Forgings, Copper Nickel Magnesium (18S-T). For forgings used primarily for pistons. Gives requirements for composition, condition, quality, reports, identification, and rejections. Similar specification, Navy 46A7 Grade 7; Federal QQ-A-367 Grade 7; and Alloy 18S-T.

Society of Automotive Engineers. Aeronautical Material Specification 4145C; 1944. Aluminum Alloy Forgings, Silicon Magnesium Copper Nickel (32S-T). For forgings used primarily for pistons. Gives requirements for composition, condition, quality, reports, identification, and rejections. Similar specification, Navy 46A7 Grade 6; and Federal QQ-A-367; Grade 6.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

U. S. Gov., Army Air Forces. Specification 11352-A; 1944. Aluminum Alloy Forgings (Zinc, Magnesium, Copper, Manganese).

U. S. Gov., Federal Specification QQ-A-367b; 1942. Aluminum-Alloy: Forgings, Heat-Treated. Covers seven classes—1, 2, 3, 5, 6, 7, and 8. Gives requirements for material, workmanship, chemical composition, physical properties, microscopic requirements, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46A7d; 1941. Aluminum-Alloy; Heat-Treated Forgings.

631.5 ALUMINUM HOLLOW WARE

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications No.38. Coffee Urns; Aluminum.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specifications No.76. Pots; Bain Marie, Aluminum.

U. S. Gov., Federal Specification RR-A-466; 1938. Amendment 2; 1940. Aluminum Ware; Bake-Shop and Kitchen. Covers 28 types and various classes thereunder for bake-shop and kitchen aluminum ware made from hard, cold-rolled, wrought aluminum, or aluminum alloy. Gives general and detail requirements for the various types relative to dimensions of ware, thickness of metal, capacities, body, and finish. Includes also requirements for various parts, such as covers, straps, clips, and handles, and methods of sampling, inspection, and tests.

U. S. Gov., Navy Dept. Specification 64P7; 1929. Bowls, Beating; Pots, Stock; Aluminum.

U. S. Gov., Navy Dept. Specification 65K1b; 1937. Kettles; Steam-Jacketed, Aluminum or Steel (Corrosion-Resisting).

U. S. Gov., U. S. Army, Medical Dept. Specification 28-11; 1934. Pot; Coffee, 11 1/2 Quart.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-47; 1939. Kettle; Steam-Jacketed.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-19; 1937. Pot; Stock, Aluminum.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-117; 1941. Pot, Cook, Aluminum, Heavy, 15-Gallon, Cover, Heavy; and Plate, Splash; for Range, Field, M 1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-118; 1941. Pan, Aluminum, Bake and Roasting; and Cover; for Range, Field, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-82; 1936. Basin; Wash, Aluminum.

631.6 EXTRUDED ALUMINUM

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 40; 1943. Hinge; Half, Continuous, Extruded Aluminum Alloy. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Aluminum Wrought Alloys, revised 1944. Specifications indicate the fabricated forms in which each alloy is regularly manufactured, and include compositions in percentages for various wrought aluminum alloys. Gives general information and mechanical properties for 13 alloys including bars, plates, shapes, sheets, rods, wires, tubes, forgings, and extruded aluminum.

631.9 MISCELLANEOUS ALUMUNUM ARTICLES

American Hospital Assn., 4-10. Wire Screen Cloth. Covers copper, commercial bronze (brass), bronze, iron or steel, galvanized (zinc coated), copper-nickel alloy, corrosion-resisting steel (chromium-nickel), aluminum alloy, iron or steel, japanned or painted, and chromium-nickel alloy.

American Hospital Assn., 4-52. Safety Treads. Covers two types—(A) brass-base and (B) aluminum-base.

Society of Automotive Engineers. Aeronautical Standard No.90; 1942. Propeller Blades; Aluminum-Alloy, Shank Dimensions for. Diagrammatic dimensional drawing.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-20; 1944. Aluminum: Foil.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-2: 1943. Nuts: Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-5; 1944. Nuts; Self Locking.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-25-2; 1944. Propeller Blades; General Specification for, Solid, Aluminum Alloy.

U. S. Gov., Marine Corps Specification, 1938. Scoop; Flour and Sugar, Cast Aluminum.

U. S. Gov., Navy Dept. Specification 12T4f; 1939. Treads; Safety.

U. S. Gov., Navy Dept. Specification 45F13; 1940. Fittings; Pipe, Aluminum-Alloy (Threaded), 125-Pound.

U. S. Gov., Navy Dept. Specification 47A5b; 1936. Aluminum Foil.

U. S. Gov., Navy Dept. Specification 47T2; 1944. Tape; Metal, Colored.

U. S. Gov., Navy Dept. Specification 64E1b; 1944. Extractors; Fruit-Juice.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 29-62A; 1940. Scoop; Loading, Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-43A; 1933. Aluminum; Flaked and Grained, for Use in Pyrotechnic Mixtures.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-71B; 1937. Can; Meat, M-1932.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-39; 1937. Carrier; Top-Load, Saddle, Phillips' Pack, Cargo, Artillery.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-589; 1941. Band; Type PG-16, Pigeon Leg.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-716B; 1938. Cipher Device; Type M-138-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-8; 1927. Holder; Message, Type PG-14, Pigeon Leg.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-26C; 1930. Cipher Device; Type M-94.

U. S. Gov., Veterans Administration. Specification VA-G-174a; 1936. Pots; Stock, Deep, Aluminum, Capacity 25 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-175c; 1937. Pot; Stock, Aluminum, Capacity 60 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-177a; 1937. Pot; Stock. Deep, Aluminum, Capacity 100 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-178a; 1937. Pots; Stock, Deep, Aluminum, Capacity 60 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-179; 1936. Pot; Stock, Aluminum, Capacity 100 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-180; 1936. Pot; Sauce, Aluminum, Capacity 60 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-184a; 1937. Kettles; Preserving, Aluminum, Capacity 21 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-197a; 1937. Tubs; Pie, Aluminum, Capacity 102 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-293; 1938. Kettles; Preserving, Aluminum.

References.—Propeller blade ends of aluminum alloy, *see* 724.24; aluminum drums, *see* 951.32; aluminum chemical compounds, *see* 838; methods of testing, general requirements for metals, *see* 600.1, 631.0; aluminum alloys in form of bolts, nuts, rivets, and screws, *see* 631.11; aluminum powder for paints, *see* 847.1.

632. ANTIMONY

632.1 GENERAL SPECIFICATIONS FOR ANTIMONY

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Antimony. Covers definition, constants, derivation, purity, grades or forms available, specification, uses, substitutes, and marketing information.

632.2 ANTIMONY INGOT METAL

632.3 ANTIMONY ALLOYS

References.—Antimony-lead alloys, *see* 651.6, 692, 693.1.

632.4 ANTIMONY COMPOUNDS AND SALTS

References.—Chemical compounds of antimony, *see* 839.31.

632.5 ANTIMONY, POWDERED

633. BISMUTH

633.0 GENERAL ITEMS

American Society for Metals. Metals Handbook, 1939 edition. Properties of Bismuth Alloys. Covers low melting alloys.

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Bismuth Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers bismuth alloys.

633.1 BISMUTH METAL

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Bismuth. Covers definition, constants, solubility, derivation, uses, and grades and forms.

References.—Chemical compounds of bismuth, *see* 836.

634. CADMIUM

American Society for Metals. Metals Handbook, 1939 edition. Constitution and Properties of Cadmium. Covers constitution of the cadmium-nickel alloys and properties of the cadmium-nickel alloys.

American Standards Assn., Z37.5-1941. American Defense Emergency Standard, prepared by the U. S. Public Health Service. Allowable Concentration of Cadmium. To prescribe the permissible concentration of cadmium in the atmosphere of work places for the protection of the health of all workers. Gives properties of cadmium, permissible concentration, sampling procedure, and analytical methods.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cadmium. Covers definition, constants, solubility, derivation, forms available, purity, uses, supply, and marketing.

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-671a; 1944. Anodes; Cadmium.

U. S. Gov., Navy Dept. Specification 46C7; 1944. Cadium; Ingots.

References.—Chemical compounds and medicinals of cadmium, *see* 839.39; cadmium plating, *see* 600.3.

635. COBALT

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cobalt. Covers definition, constants, solubility, occurrence, specifications, containers, uses, and marketing.

U. S. Gov., Army Air Forces. Specification 10300-1; 1937. Rods; Welding, Chromium-Cobalt-Tungsten Composition, for Hard-Facing Metal Parts.

U. S. Gov., Navy Dept. Specification 46R5b; 1938. Rods; Welding, Chromium-Cobalt Composition.

635.1 COBALT COMPOUNDS AND SALTS

U. S. Gov., Navy Dept. Specification 51C23a; 1939. Cobalt Acetate.

References.—Chemical compounds of cobalt, *see* 839.32.

640-649 COPPER, BRASS, AND BRONZE

640. GENERAL ITEMS

Copper and Brass Research Assn. Data Standards Data-1 to Data-69, inclusive, 1944. Covers standard decimal equivalents in inches for various gages, inches and fractions thereof expressed as decimals of a foot, fractions expressed as decimals, use of weight tables, and weights of flat products, circles, rods, bars, shapes, wire, seamless tubes, and estimating data for condenser and other heat exchange tubes.

Copper and Brass Research Assn. General Standards, 1944. These standards apply to mill products of copper, brass, bronze, and related alloys, including plates, sheets, strips, rods, bars, wire, pipe, tubes, and shapes; but not wire and cable of copper and copper alloy for electrical transmission. Gives general information and information needed with purchase order.

Copper and Brass Research Assn. Terminology Standards TERM-1 to TERM-11, inclusive, 1944. Covers classification of flat products, classification of products other than flat, edges available, and terminology (definitions).

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. Notes on Brass, Bronze, and Copper Alloys, revised 1944. The two principal alloys of copper are brass and bronze and they have zinc and tin, respectively, as their other major constituent. Covers wrought copper, copper alloys, and gives table showing classification and uses of copper alloys.

640.1 THICKNESS TOLERANCES FOR NONFERROUS SHEETS AND STRIPS

641. COPPER

641.0 GENERAL ITEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for working stresses (tension, compression, shearing, bearing) of the cast, rolled, drawn, or extruded metals used.

American Society for Testing Materials, B 154-41T; 1941. Tentative Method of Mercurous Nitrate Test for Copper and Copper Alloys. An accelerated corrosion test for the purpose of determining in copper or copper-base alloy products of assemblies the presence of applied (external) or residual (internal) stresses, or a combination of these stresses, which might bring about failure of the material in service or storage through stress corrosion or season cracking. A suitable specimen is subjected to the effects of mercury corrosion, mercury being provided by displacement of that metal from an acidified aqueous solution of mercurous nitrate by the metal of the specimen. Covers apparatus, mercurous nitrate solution, test specimen, procedure, and report.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Copper. Covers definition, constants, derivation, specifications, grades, forms available, impurities, general information, and definition; grades available, gages and sizes, physical properties, and special finishes for copper sheet and strip.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C66; 1917. Standard Samples for Thermometric Fixed Points. Description of preparation of pure samples of copper; their chemical analyses, freezing points, and degree of purity; their use for the standardization of thermocouples, pyrometers, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement; 1944. Standard Samples. Copper, Sample 45b. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

641.1 COPPER INGOTS AND BARS

641.11 Ingots and Cast Bars, Copper

American Society for Testing Materials, B 4-42; 1942. American Assn. of State Highway Officials, M 109. American Standards Assn., H 17.1-1942. Lake Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars. Gives chemical composition, chemical analysis, resistivity, resistivity test, physical defects, standard sizes and shapes, permissible variations in weight and dimensions, marking, lots, and claims.

American Society for Testing Materials, B 5-43; 1943. American Assn. of State Highway Officials, M110. American Standards Assn., H 17.2-1943. Electrolytic Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars. Gives chemical composition, chemical analysis, resistivity, resistivity test, physical defects, standard sizes and shapes, permissible variations in weight and dimensions, marking, lots, claims, and settlement of claims.

American Society for Testing Materials, B 72-33; 1933. American Assn. of State Highway Officials, M119-35. Fire-Refined Copper Other Than Lake. For use in rolling into sheets and shapes for mechanical purposes, but not for electrical purposes nor wrought alloys. Requirements for chemical composition, physical defects, permissible variations in weight and dimensions, marking, lots, claims, and settlement of claims.

American Society for Testing Materials, B 115-43; 1943. Electrolytic Cathode Copper. Gives requirements for quality, chemical analysis, physical condition, claims, investigation of claims, and settlement of claims.

American Society for Testing Materials, B 133-44T; 1944. Tentative Specifications for Copper Rods, Bars, and Shapes. For general purposes, Type A for hardness and Type B for tensile requirements. Covers materials, manufacture, sampling, hardness of Type A, and tensile properties of Type B, bending properties, electrical resistivity, embrittlement, test specimen, density, tolerances, and finish.

American Society for Testing Materials, B 170-44T; 1944. Tentative Specification for Oxygen-Free Electrolytic Copper Wire Bars, Billets, and Cakes. Covers material produced without the use of residual metallic or metalloidal deoxidizers. Gives requirements for quality, chemical analysis, resistivity, microscopic examination, embrittlement test, weights of individual pieces, workmanship, marking, and investigation and settlement of claims.

American Society for Testing Materials, ES-7; 1942. Emergency Specification for Fire-Refined Copper for Wrought Products and Alloys. Intended for alloying and for sheets and shapes for mechanical purposes, and not for electrical purposes. Requirements for material, analysis, physical defects, permissible variations, markings, and claims.

American Transit Assn. Specification for Overhead Line Material for Direct and Catenary Suspension, D102-39; 1939. Copper required in this specification shall conform to the requirements for "low resistance lake" of current specification Serial B-4 for Lake Copper, or to the current specification Serial B-5 for Electrolytic Copper, both of the American Society for Testing Materials.

U. S. Gov., Federal Specification QQ-C-521a; 1938. Copper; Ingots. Covers two grades—(A) electrolytic and (B) refined from ore or reclaimed from scrap. Gives requirements for purity, electrical resistivity, and complete analysis for grade A; chemical composition for grade B; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46C5c; 1924. Copper; Ingots.

U. S. Gov., Navy Dept. Specification 47C2f; 1933. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0.

641.12 Rolled Bars, Copper

American Society for Testing Materials, B12-42; 1942. A.S.M.E. Boiler Construction Code Specification SB-12. Copper Bars for Locomotive Staybolts. For arsenical and nonarsenical copper bars. Gives manufacture, chemical composition, check analysis, tensile and bending properties, test specimens, number of tests, methods of testing, permissible variations in dimensions, workmanship and finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-B12; 1942. affected section 4, Chemical Composition.

American Society for Testing Materials, B 133-44T; 1944. Tentative Specifications for Copper Rods, Bars, and Shapes. For general purposes, Type A for hardness and Type B for tensile requirements. Covers material, manufacture, sampling, hardness of Type A, and tensile properties of Type B, bending properties, electrical resistivity, embrittlement, test specimen, density, tolerances, and finish.

American Society for Testing Materials, B187-44T; 1944. Tentative Specifications for Copper Bus Bars, Rods, and Shapes. Gives scope, description of terms, basis of purchase, manufacture, physical and electrical requirements, miscroscopic examination, embrittlement, test specimens, number of test specimens, methods of test, diameter, thickness, tolerances, edges, finish, packing, inspection, and rejection.

U. S. Gov., Federal Specification QQ-C-501a; 1940. Amendment 3; 1944. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes one grade of bars—soft and hard tempers. Gives requirements for material, workmanship, physical properties, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 47C2f; 1933. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0.

641.2 COPPER PLATES, SHEETS, SHAPES, AND STRIPS

641.21 Plates and Sheets, Copper

American Society for Testing Materials, B 11-41; 1941. A.S.M.E. Boiler Construction Code Specification SB-11. Copper Plates for Locomotives Fireboxes. Covers four grades of copper plates: Tough pitch copper (nonarsenical); phosphorized copper (nonarsenical); tough pitch arsenical copper; and phosphorized arsenical copper. Basis of purchase, manufacture, chemical composition, check analysis, tensile and bending properties, test specimens, number of tests, weight tolerances, workmanship and finish, marking, inspection, rejection, and rehearing.

American Society for Testing Materials, B 100-44; 1944. American Assn. of State Highway Officials, M108-44. Rolled Copper-Alloy Bearing and Expansion Plates for Bridge and Other Structural Uses. For use where motion is slow and intermittent and pressure does not exceed 3,000 psi. Gives requirements for two grades of alloy, manufacture, chemical analysis, physical properties, methods of testing, thickness and weight tolerances, finish, inspection, and rejection.

American Society for Testing Materials, B 101-40; 1940. Lead-Coated Copper Sheets. For architectural uses, applied molten and electrodeposited, in three classes based on weight of coating. Requirements for copper, lead, manufacture, temper, permissible variations in weight and dimensions, and workmanship.

American Society for Testing Materials, B 152-44T; 1944. Tentative Specifications for Copper Sheet, Strip, and Plate. Covers seven types; i.e., electrolytic tough pitch copper; phosphorized copper, high residual phosphorus; oxygen-free copper without residual metallic deoxidants; silver-bearing copper, tough pitch; silver-bearing copper, phosphorized; silver-bearing copper, oxygen-free; and arsenical tough pitch copper. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tempers, tensile properties of cold- and hot-rolled tempers, grain size of cold-rolled annealed tempers, Rockwell hardness, microscopic examination, embrittlement, electrical resistance, number of tests, methods of testing, tolerances, finish, inspection, and rejection.

Copper and Brass Research Assn. Flat Products Standards FP-1 to FP-7, inclusive, 1944. Covers rolled flat products, cold rolled, thickness tolerances; rolled flat products, length, width and straightness tolerances; rolled flat products, copper sheet and strip rolled to weight; rolled flat products, circles and half circles, diameter tolerances; rolled flat products, hot rolled plates and sheets, weight tolerances; silicon bronze (copper-silicon alloy) A.S.M.E. code tank plates and sheets, weight and thickness tolerances; and drawn strip, bar and flat wire, thickness and width tolerances; rolled flat products, condenser tube plates, tolerances, thickness, diameter, length or width, and flatness.

Society of Automotive Engineers. Aeronautical Material Specification No. 4500; 1940. Copper Sheet. Covers requirements for composition (not less than 99.90 percent copper, silver being counted as copper), condition, quality, tolerances, and rejections. Similar to U. S. Gov. Federal Specification QQ-C-501; U. S. Gov., Navy Dept., Specification 47 C 2; and Society of Automotive Engineers Specification 71.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 71—Copper Sheet. Covers composition in percentage, general information, physical properties, tensile strength requirements, and grain size requirements.

U. S. Gov., Federal Specification QQ-C-501a; 1940. Amendment 3; 1944. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes one grade of sheets—soft, hard, and light cold-rolled; and one grade of plates—soft and hard. Gives requirements for material, workmanship, physical properties, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 47C2f; 1933. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0; bar for rolling into sheets, *see* 641.11; thickness tolerances, *see* 640.1.

641.22 Shapes, Copper

American Society for Testing Materials, B 133-44T; 1944. Tentative Specifications for Copper Rods, Bars, and Shapes. For general purposes, Type A for hardness and Type B for tensile requirements. Covers material, manufacture, sampling, hardness of Type A, and tensile properties of Type B, bending properties, electrical resistivity, embrittlement, test specimen, density, tolerances, and finish.

American Society for Testing Materials, B187-44T; 1944. Tentative Specifications for Copper Bus Bars, Rods, and Shapes. Gives scope, description of terms, basis of purchase, manufacture, physical and electrical requirements, microscopic examination, embrittlement, test specimens, number of test specimens, methods of test, diameter, thickness, tolerances, edges, finish, packing, inspection, and rejection.

Copper and Brass Research Assn. Rod, Wire, Shapes Standards ROD-1 to ROD-3-A, inclusive, 1944. Covers rod and wire, diameter tolerances, extruded rod, bar and wire, diameter tolerances, hot rolled round rod and wire, diameter tolerances; drawn rod and bar, drawn strip and drawn flat wire, shapes length tolerances and schedule of short lengths; drawn rod and bar, drawn strip and drawn flat wire, shapes straightness tolerances.

U. S. Gov., Federal Specification QQ-C-501a; 1940. Amendment 3; 1944. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes one grade of shapes—soft and hard. Gives requirements for material, workmanship, physical properties, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 47C2f; 1933. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0; bars for rolling into shape, *see* 641.11.

641.23 Strips, Copper

American Society for Testing Materials, B 152-44T; 1944. Tentative Specifications for Copper Sheet, Strip, and Plate. Cover 7 types; i.e., electrolytic tough pitch copper; phosphorized copper, high residual phosphorus; oxygen-free copper without residual metallic deoxidants; silver-bearing copper, tough pitch; silver-bearing copper, phosphorized; silver-bearing copper, oxygen-free; and arsenical tough pitch copper. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tempers, tensile properties of cold- and hot-rolled tempers, grain size of cold-rolled annealed tempers, Rockwell hardness, microscopic examination, embrittlement, electrical resistance, number of tests, methods of testing, tolerances, finish, inspection, and rejection.

U. S. Gov., Federal Specification QQ-C-501a; 1940. Amendment 3; 1944. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes one grade of strips—soft, hard, and light cold-rolled. Gives requirements for material, workmanship, physical properties, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 47C2f; 1933. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0; standard gage and thicknesses for copper strips, *see* 641.21.

641.3 COPPER COMPOUNDS AND SALTS

References.—Chemical compounds of copper, *see* 839.33.

642. MANUFACTURES OF COPPER

642.1 COPPER RODS, WIRES, AND SLEEVES

642.11 Rods, Copper

American Society for Testing Materials, B49-41; 1941. American Standards Assn., H4.7-1942. Hot-Rolled Copper Rods for Electrical Purposes. Covers—(a) black or (b) cleaned hot-rolled copper rods (diameters from 0.250 to 1.375 in.) suitable for further fabrication into electrical conductors; material, manufacture, tensile properties, resistivity, dimensions and permissible variations; density, finish, packing and shipping, and inspection.

American Society for Testing Materials, B 124-44 T; 1944. Tentative Specifications for Copper-Base Alloy Forging Rods, Bars, and Shapes. Covers 12 alloys for hot forging. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tolerances, workmanship and finish, inspection, rejection, and probable range of physical properties of forgings, as forged.

American Society for Testing Materials, B187-44T; 1944. Tentative Specifications for Copper Bus Bars, Rods, and Shapes. Gives scope, description of terms, basis of purchase, manufacture, physical and electrical requirements, microscopic examination, embrittlement, test specimens, number of test specimens, methods of test, diameter, thickness, tolerances, edges, finish, packing, inspection, and rejection.

Copper and Brass Research Association. Rod, Wire, Shapes Standards ROD-1 to ROD-3-A, inclusive, 1944. Covers rod and wire, diameter tolerances, extruded rod, bar and wire, diameter tolerances, hot rolled round rod and wire, diameter tolerances; drawn rod and bar, drawn strip and drawn flat wire, shapes length tolerances and schedule of short lengths; drawn rod and bar, drawn strip and drawn flat wire, shapes straightness tolerances.

U. S. Gov., Federal Specification QQ-C-501a; 1940. Amendment 3; 1944. Copper; Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes one grade of rods—soft and hard tempers. Gives requirements for material, workmanship, physical properties, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46R1b; 1933. Rods; Welding, Nonferrous (for Gas Welding).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-154-1B; 1943. Copper Rod; Special, for Pressure Cylinders, All Types.

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0; bars for rolling into rods, *see* 641.12; welding apparatus and procedure, *see* 767.

642.12 Wires, Copper

American Society for Testing Materials, B 99-42; 1942. Copper-Silicon Alloy Wire for General Purposes. For general structural purposes except for electrical transmission cable. Basis of purchase, manufacture, chemical composition, chemical analysis, bending properties, grain size determination, number of tests, dimensional tolerances, workmanship, and finish, packing, inspection, rejection, and table of commercially available alloy wire.

Copper and Brass Research Assn. Rod, Wire, Shapes Standard ROD-1 to ROD-3-A inclusive, 1944. Covers rod and wire, diameter tolerances, extruded rod, bar and wire, diameter tolerances, hot rolled round rod and wire, diameter tolerances; drawn rod and bar, drawn strip and drawn flat wire, shapes length tolerances and schedule of short lengths; drawn rod and bar, drawn strip and drawn flat wire, shapes straightness tolerances.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 83—Soft or Annealed Copper Wire. Covers general information, composition, physical properties, mechanical requirements, shapes, finish, specific gravity, dimensions and permissible variations, and electric resistivity.

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

References.—Electric cables, cord, and wire, *see* 715.41, 715.42, 715.44.

642.13 Sleeves, Copper

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-37; 1930. Tinned Copper Sleeves for Cable Conductors. For both straight and butt or bridge joints in sizes for Nos. 10 to 16 A.W.G. conductors, for making soldered joints in cable conductors. Requirements for No. 22 gage copper, tinning, and stops, with dimensional drawing.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-58; 1936. Splicing and Dead Ending Copper Sleeves for Twist Joints. For use in making twist joints in copper line wire, brazed sleeves formed from sheet metal, and seamless sleeves formed from seamless copper tubing, with dimensional requirements of 4 to 16 gages.

Edison Electric Institute. Specifications for Single Tube Seamless Copper Splicing Sleeves, TD-9; 1942. For use in overhead line construction. Gives requirements for material, electrical properties, shapes and sizes, finish, marking of sleeves, packing and shipping, inspection, rejection, explanatory notes, and dimensional drawing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-440B; 1937. Sleeve; Copper- Double-Tube, Wire Splicing.

References.—Copper tubing, *see* 642.24.

642.14 Chain, Copper

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types—(A) welded; two grades—(I) crane, wrought iron; and (II) proof coil, wrought iron, or open-hearth steel; and (B) weldless steel, copper, brass, or bronze; six classes for type A—(1) close link; (2a) long link, buoy or submarine net; (2b) long link, conveyor or sprocket wheel; (3a) twist link, plain pattern; (3b) twist link, long-link pattern; and (3c) twist link, short-link pattern; twelve classes for type B—(1) single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link (long pitch), (4b) flat link (short pitch), (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass, for mechanical communications. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

642.2 COPPER CASTINGS, FERRULES, PIPES, AND TUBES

642.21 Castings, Copper

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-77; 1944. Copper-Base-Alloy; Die-Castings.

References.—Other specifications for copper castings, *see* specifications of individual commodities made of cast copper.

642.22 Ferrules, Copper

American Society for Testing Materials, B 111-43; 1943. A.S.M.E. Boiler Construction Code Specification SB-111. Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock. For use in surface condensers, evaporators, and heat exchangers. Gives requirements for material, manufacture, chemical composition, sample for chemical analysis, microscopic examination, expanding test, mercurous nitrate test, hydrostatic test, dimension and weight tolerances, workmanship, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-B-111; 1942, affected section 3, Material.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Copper Flue Ferrules. Gives inside and outside dimensions, and length, for various thicknesses, and for application to flues from 2 to 5 1/2 in. nominal diameter.

642.23 Pipes, Copper

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Copper Pipes and Tubes; Seamless. Include rules for inspection and tests.

American Society for Testing Materials, B 42-43; 1943. A.S.M.E. Boiler Construction Code Specification SB-42. Copper Pipe; Standard Sizes. Covers seamless copper pipe in all standard pipe sizes, both regular and extra-strong, suitable for use in plumbing, boiler feed lines, and for similar purposes. Gives requirements for basis of purchase, manufacture, condition of temper, chemical composition, sampling for chemical analysis, expansion test, bending properties, microscopic examination, hydrostatic test, dimensions and weights, tolerances, workmanship, inspection, and rejection.

American Society for Testing Materials, B188-44T; 1944. Tentative Specifications for Copper Bus Pipes and Tubes. Gives scope, description of terms, basis of purchase, manufacture, physical and electrical requirements, microscopic examination, embrittlement, test specimens, number of test specimens, methods of test, pipe dimensions and tolerances, tube dimensions and tolerances, finish, packing, inspection, and rejection.

Copper and Brass Research Assn. Round Seamless Tubes, 1939. Includes copper water tube, brass and copper pipe, condenser and other heat exchanger tubes; gage or wall thickness tolerances for refractory and nonrefractory alloys, mean diameter tolerances, length tolerances, weight tolerances, and estimating data for condenser and other heat exchanger tubes.

Copper and Brass Research Assn. Tube, Pipe Standards TUBE-1 to TUBE-8, inclusive, 1944. Covers round seamless tubes, wall thickness and diameter tolerances; round seamless tubes, length tolerances, straightness tolerances; copper water tube, standard dimensions and weights, diameter and wall thickness tolerances, weight tolerances; pipe, dimensions and weights, weight and wall thickness tolerances; condenser and other heat exchanger tubes, dimensions and weight tolerances; and condenser and other heat exchanger tubes, estimating data.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pipe and Tube; Copper. Covers definition, weight, sizes, and marketing customs.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS5-40; 1940. Copper Pipe Nipples. Gives detail requirements and chemical composition of nipples for standard weight and extra strong. Copper pipe nipples shall be made only from tested new seamless copper pipe conforming in all respects to the requirements of Federal Specification WW-P-377 or to A.S.T.M. Specification B42. This standard includes also methods of packaging and labeling.

U. S. Gov., Federal Specification WW-P-377; 1932. Pipe; Copper, Seamless, Iron-Pipe Size, Standard. Covers one grade. Gives permissible variations in outside diameter, standard weights, dimensions, and sizes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 44P2g; 1938. Pipe; Copper, Seamless, Iron-Pipe Size, Standard.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels, and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for seamless copper tubing and seamless copper pipe (at temperatures not exceeding 406° F. for boiler-feed lines, blow-off lines, compressed air lines, salt and fresh water lines, and saturated steam lines for pressures not exceeding 180 lb. p.s.i. gage pressure); process, condition of temper, chemical composition, expansion test, bending properties, microscopic examination, and hydrostatic test.

References.—Copper tubing, *see* 642.24; pipe installation and threads, iron or steel pipe, *see* 607.0; methods of testing, general requirements for metals, *see* 600.1, 641.0.

642.24 Tubes, Copper

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Copper Pipes and Tubes; Seamless. Include rules for inspection and tests.

American Society for Testing Materials, B 13-41; 1941. A.S.M.E. Boiler Construction Code Specification SB-13. Seamless Copper Boiler Tubes. Covers arsenical and nonarsenical tubes for locomotive boilers. Basis of purchase, manufacture, chemical analysis, temper; flange, crush, and hydrostatic tests; test specimens, number of tests, retests, standard weights, weight and dimension tolerances, workmanship and finish, marking, inspection, rejection, and rehearing.

American Society for Testing Materials, B 68-43; 1943. Seamless Copper Tubing; Bright Annealed. For use in refrigerators, oil lines, gasoline lines, etc. where tubing absolutely free from scale dirt is required. Gives requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis, grain size, tensile properties, expansion test, microscopic examination, embrittlement, number and methods of test, tolerances, workmanship and finish, packing, marking, and rejection.

American Society for Testing Materials, B 75-43T; 1943. A.S.M.E. Boiler Construction Code Specification SB-75. Tentative Specifications for Seamless Copper Tubes. Covers seamless copper tubes suitable for general engineering purposes in five types. Gives requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis, methods of chemical analysis, physical properties, expansion and hydrostatic tests, electrical resistivity, number of tests, microscopic examination, embrittlement, methods of testing, standard weight, tolerances, workmanship and finish. inspection, and rejection.

American Society for Testing Materials, B 88-41; 1941. American Standards Assn., H23.1-1941. Copper Water Tube. Covers seamless tubes designed for plumbing purposes, underground water service, etc., but also suitable for coil water heaters, fuel oil lines, gas lines, etc. Includes annealed, and drawn temper, chemical composition requirements, specimen, tensile, expansion, and hydrostatic tests, standard dimensions and weights, tolerances, and finish.

American Society for Testing Materials, B 111-43; 1943. A.S.M.E. Boiler Construction Code Specification SB-111. Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock. For use in surface condensers, evaporators, and heat exchangers. Gives requirements for material, manufacture, chemical composition, sample for chemical analysis, microscopic examination, expanding test, mercurous nitrate test, hydrostatic test, dimension and weight, tolerances, workmanship, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-B-111; 1942, affected section 3, Material.

American Society for Testing Materials, B153-44T; 1944. Tentative Method of Test for Expansion (Pin Test) of Copper and Copper-Alloy Tubing. Includes apparatus, test specimen, procedure, and retests.

American Society for Testing Materials, B188-44T; 1944. Tentative Specifications for Copper Bus Pipes and Tubes. Gives scope, description of terms, basis of purchase, manufacture, physical and electrical requirements, microscopic examination, embrittlement, test specimens, number of test specimens, methods of test, pipe dimensions and tolerances, tube dimensions and tolerances, finish, packing, inspection, and rejection.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Copper Tubing for Railroad Service. Standard. Tables of sizes and weight, bursting pressure, and wall thickness for two services; air brake, air conditioning and miscellaneous; and lubricator lines and saturated steam up to 450° F.

Copper and Brass Research Assn. Tube, Pipe Standards TUBE-1 to TUBE-8, inclusive, 1944. Covers round seamless tubes, wall thickness and diameter tolerances, round seamless tubes, length tolerances, straightness tolerances; copper water tube, standard dimensions and weights, diameter and wall thickness tolerances, weight tolerances; pipe, dimensions and weights, weight and wall thickness tolerances; condenser and other heat exchanger tubes, dimensions and weight tolerances; and condenser and other heat exchanger tubes, estimating data.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pipe and Tube; Copper. Covers definition, weight, sizes, and marketing customs.

Society of Automotive Engineers. Aeronautical Material Specification 4665; 1941. Copper Silicon Bronze, Seamless Tubing. Gives requirements for composition, condition (soft annealed), quality, tolerance, reports, identification, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 75—Copper Tubing, Covers composition in percentage, general information, expanding test, appearance, dimensional tolerances, tensile hardness and grain size requirements, and special limits.

Underwriters' Laboratories, Inc. Standard for Seamless Drawn, Annealed Copper and Brass Tubing and Fittings, 1940. For semiflexible connection between rigid piping and stationary gas-consuming appliances, house piping of compressed gas, except acetylene. Also for oil burner tubing, including gasoline lines where permitted, 3/8- to 2-in. gas tubing, 1/4- to 7/16-in. oil burner tubing, physical properties, design of fittings, and labeling.

U. S. Gov., Federal Specification WW-T-797; 1932. Tubing; Copper, Seamless (for General Use With I. P. S. Flanged Fittings). Covers one grade and four types—(A) maximum nominal working pressure, 100 lb. per square inch, (B) 200 lb. per square inch, (C) 300 lb. per square inch, and (D) 450 lb. per square inch. Gives requirements for tolerances, permissible variations, weights, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification WW-T-799a; 1943. Tubing; Copper, Seamless (for Use With Soldered or Flared Fittings). Covers one grade and four types—(K) for soldered or flared type fittings, (L) for soldered fittings only, (M) for soldered fittings only, and (N) for such use as fuel and lubrication tubes—for soldered or flared type fittings. Gives requirements for material and workmanship, marking, condition and length of tubing, tolerances on length, wall thickness and outside diameter, weight, and tables giving dimensions and minimum test pressure for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 44T12c; 1938. Tubing; Copper, Seamless, for Pressure Up to 4,000 Pounds Per Square Inch.

U. S. Gov., Navy Dept. Specification 44T39a; 1944. Tubes; Condenser, Copper-Nickel-Alloy.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation, Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels, and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for seamless copper tubing and seamless copper pipe (at temperatures not exceeding 406° F. for boiler-feed lines, blow-off lines, compressed air lines, salt and fresh water lines, and saturated steam lines for pressures not exceeding 180 lb. p.s.i. gage pressure); process, condition of temper, chemical composition, expansion test, bending properties, microscopic examination, and hydrostatic test.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-192-1B; 1941. Tube; Copper-Silicon Bronze, Seamless, for Aircraft.

References.—Copper pipe, *see* 642.23; methods of testing, general requirements for metals, *see* 600.1, 641.0; automobile fuel and lubrication tube fittings, *see* 722.33.

642.25 Pipe and Tube Fittings, Copper

American Society of Mechanical Engineers. American Standards Assn., A40.3-1941. Soldered Joint Fittings. Covers certain dimensions of soldered-joint wrought metal and cast brass fittings for copper water tube, including—(1) detailed dimensions of the bore, (2) minimum specifications for materials, (3) minimum inside diameter of the fittings, (4) metal thickness for both wrought metal and cast brass fittings, and (5) general dimensions for cast brass fittings, including center-to-shoulder dimensions for both straight and reducing cast fittings. Due to the variety of methods used for forming wrought metal fittings, the laying length of these fittings (center-to-shoulder) is not given at this time.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS5-40; 1940. Pipe Nipples; Brass, Copper, Steel, and Wrought-Iron. This standard covers steel, ferrous-alloy and wrought-iron nipples, black- and zinc-coated (hot dip galvanized), in iron-pipe sizes from 1/8 to 12 in., of standard length; and brass and copper nipples in standard sizes 1/8 to 6 in. Gives tables showing pipe sizes and various lengths, packaging, and labeling. Initiated by manufacturers, now represented by National Assn. of Pipe Nipples Manufacturers.

642.3 GRAVITY BATTERY COPPERS

References.—Gravity battery copper, *see* 712.5.

642.4 COPPER WIRE CLOTH

American Hospital Assn., 4-10. Wire Screen Cloth. Covers copper, commercial bronze (brass), bronze, iron or steel, galvanized (zinc coated), copper-nickel alloy, corrosion-resisting steel (chromium-nickel), aluminum alloy, iron or steel, japanned or painted, and chromium-nickel alloy. Based on U. S. Gov. Federal Specifications RR-C-541a for Wire Screen Cloth and QQ-M-151a for General Specification for Inspection of Metals.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S.A.E. Standard Wire Cloth, adopted 1924. Table of sizes and dimensions with tolerances and types of weave.

U. S. Gov., Army Air Forces. Specification 16106-A (1); 1944. Cloth; Wire Mesh, Cotton Covered.

U.S. Gov., Federal Specification RR-C-451a; 1934. Amendment 4; 1944. Cloth; Wire, Screen. Covers four types, including type A—copper. Gives requirements for material and workmanship, number of meshes per inch, diameter of wire, construction, length, width, and composition of wire; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Brass sieves, *see* 645.31; brass and bronze wire cloth, *see* 645.39, 646.52; methods of testing, general requirements for metals, *see* 600.1, 641.0.

642.5 HOLLOW WARE, COPPER

U. S. Gov., Navy Dept. Specification 41P2c; 1943. Pots; Glue, Copper.

References.—Fuel Tanks for internal combustion engines, of copper, *see* 956.2; fuel tanks for kerosene stoves, of copper, *see* 956.2; sterilizers for surgical instruments, dressing containers, *see* 915.32.

642.6 BRUSH COPPER AND MATS

642.61 Brush Copper

642.62 Mats, Copper

642.7 COPPER METAL PARTS OF BUILDINGS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R29-42; 1942. Eaves Trough, Conductor Pipe and Fittings, and Ridge Rolls. This recommendation establishes a simplified schedule of sizes and weights of eaves trough, conductor pipe, fittings, and styles of gutters and ridge rolls. Sponsored by the National Assn. of Sheet Metal Distributors and the National Wholesale Hardware Assn. of U. S.

642.9 MISCELLANEOUS MANUFACTURES OF COPPER

American Society for Testing Materials, B 101-40; 1940. Lead-Coated Copper Sheets. For architectural uses, applied molten and electrodeposited, in three classes based on weight of coating. Requirements for copper, lead, manufacture, temper, permissible variations in weight and dimensions, and workmanship.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R150-34; 1934. Copper Wire Nails. This schedule establishes standard sizes and varieties of copper wire nails, flat head, and copper wire slating nails. Sponsored by the Copper and Brass Research Assn.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Copper Flashing.

U. S. Gov., Navy Dept. Specification 30T2; 1933. Toilet-Sets; Stateroom, Metal (Ewers; Jars, Waste; Washbowls).

U. S. Gov., Navy Dept. Specification 43R6; 1937. Rivets, Belt, Copper; and Burrs, Copper.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-122; 1939. Copper Scrap.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-226A; 1942. Anode; Copper.

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0; chemical fire extinguishers of copper, *see* 973.3; nails, spikes, tacks of copper, *see* 608.1; terminals and soldering lugs of copper, *see* 715.34, 715.35; asbestos copper gaskets, *see* 707.11; electric switches and circuit breakers, *see* 714.52, 714.51; radio antennas, *see* 718.61; soldering coppers, *see* 615.71; lightning rods, *see* 715.50.

643. COPPER ALLOYS

643.0 GENERAL ITEMS

American Society for Metals. Metals Handbook, 1939 edition. Constitution of Copper Alloys and Properties of Copper and Its Alloys. Covers constitution of copper-aluminum, copper-beryllium, copper-cadmium, copper-chromium, copper-lead, copper-manganese, copper-nickel, copper-phosphorus, copper-silicon, copper-silver, copper-tin, copper-zinc, copper-nickel-tin, and copper-nickel-zinc alloys; the ternary system copper-zinc-tin; physical constants of copper; properties of commercially pure copper; and properties of the various copper alloys.

American Society for Metals. Metals Handbook, 1939 edition. Micrography and Technology of Copper. Covers polishing copper for metallographic examination, etching copper for macroscopic and metallographic examination, hardeners for copper and copper alloys, brass foundry temperature measurements, hot and cold working of copper alloys, machining of copper alloys, and spinning of copper and copper alloys.

American Society for Testing Materials, B 119-40T; 1940. Tentative Classification of Cast Copper-Base Alloys. Defines copper alloys as containing not over 2 percent of other elements, brass as having an appreciable amount of zinc, and bronze as having more of other alloying elements than zinc. Includes copper, 13 brasses, and 9 bronzes. Endorsed by the American Foundrymen's Assn.

American Society for Testing Materials, B153-44T; 1944. Tentative Method of Test for Expansion (Pin Test) of Copper and Copper-Alloy Tubing. Includes apparatus, test specimen, procedure, and retests.

American Society for Testing Materials, B 154-41T; 1941. Tentative Method of Mercurous Nitrate Test for Copper and Copper Alloys. An accelerated corrosion test for the purpose of determining in copper or copper-base alloy products of assemblies the presence of applied (external) or residual (internal) stresses, or a combination of these stresses, which might bring about failure of the material in service or storage through stress corrosion or season cracking. A suitable specimen is subjected to the effects of mercury corrosion, mercury being provided by displacement of that metal from an acidified aqueous solution of mercurous nitrate by the metal of the specimen. Covers apparatus, mercurous nitrate solution, test specimen, procedure, and report.

Copper and Brass Research Assn. Alloy Standards, 1944. Covers standard commercial wrought copper and copper-base alloys. Gives name, composition and forms generally available, including flat rolled products, rod and drawn bar, shapes, wire, and tube.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Classification of Cast Copper-Base Alloys. A Standardized classification and terminology of the different types of alloys.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Nominal Chemical Compositions and Chemical Specifications for Standard Alloys. Gives in tabular form chemical compositions and chemical specifications of 23 standard alloys adopted by the Institute.

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Copper Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers rods, bars, shapes, forgings, plate, sheet, strip, wire, tubing, and castings.

643.1 MANGANESE COPPER

643.2 PHOSPHOR COPPER

American Society for Testing Materials, B 52-43; 1943. Phosphor Copper. Covers two grades. Gives requirements for material, chemical composition, sampling, uniformity, marking, claims, and umpire analysis expense. Endorsed by the American Foundrymen's Assn.

U. S. Gov., Federal Specification QQ-C-571; 1932. Copper; Phosphor. Covers two grades—A and B—in the form of notched slabs or ingots. Gives requirements for chemical composition; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0.

643.3 SILICON COPPER

American Society for Testing Materials, B 53-43; 1943. Silicon Copper. Covers three grades. Gives requirements for material, chemical composition, sampling, uniformity, marking, and claims. Endorsed by the American Foundrymen's Assn.

American Society for Testing Materials, B 96-42; 1942. A.S.M.E. Boiler Construction Code Specification SB-96. Copper-Silicon Alloy Plate and Sheet for Pressure Vessels. Basis of purchase, manufacture, chemical composition, chemical analysis, tensile properties, methods of testing, number of tests, tolerances, workmanship and finish, marking, rejection, and table of commercially available alloy plate and sheet for pressure vessels.

American Society for Testing Materials, B 97-44; 1944. Copper-Silicon Alloy Sheet and Strip for General Purposes. For use in drawing, forming, stamping, and bending. Gives basis of purchase, material, chemical composition, chemical analysis, tensile strength, Rockwell hardness and grain size, number of tests, methods of testing, tolerances, finish, inspection, rejection, and table of commercially available copper-silicon alloy sheet for general purposes.

American Society for Testing Materials, B 98-44; 1944. A.S.M.E. Boiler Construction Code Specification SB-98. Copper-Silicon Alloy Rods, Bars, and Shapes. Gives basis of purchase, manufacture, chemical composition, chemical analysis, tensile and bending properties, test specimens, number of tests, dimensional tolerances, workmanship and finish, inspection, rejection, and table of commercially available copper-silicon alloy rods, bars, and shapes.

American Society for Testing Materials, B 99-42; 1942. Copper-Silicon Alloy Wire for General Purposes. For general structural purposes except for electrical transmission cable. Basis of purchase, manufacture, chemical composition, chemical analysis, bending properties, grain size determination, number of tests, dimensional tolerances, workmanship and finish, packing, inspection, rejection, and table of commercially available alloy wire.

U. S. Gov., Federal Specification QQ-C-581; 1932. Copper; Silicon. Covers one grade in the form of notched slabs or ingots. Gives requirements for chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification QQ-C-591a; 1941. Amendment 1; 1941. Copper-Silicon Alloy; Bars, Plates, Rods, Shapes, Sheets, and Strips. Covers three classes—(A) for general purpose, (B) cold-heading alloy, and (C) free-machining alloy. Gives requirements for forms and conditions of each class, material, workmanship, chemical requirements, cold bending, physical properties, and permissible variations; methods of sampling, inspection, and tests; and requirements for packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-C-593; 1933. Amendment 1; 1942. Copper-Silicon Alloy; Castings. Covers one grade. Gives requirements for quality, condition, repairing of defects, chemical composition, and physical properties; methods of inspection and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46B27a; 1945. Copper-Silicon-Alloy; Wrought: Bars, Forgings, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 46B28; 1933. Copper-Silicon-Alloy Castings.

U. S. Gov., Navy Dept. Specification 46C8; 1941. Copper-Nickel-Alloy (70-30); Castings.

U. S. Gov., Navy Dept. Specification 46C9; 1942. Copper-Silicon-Alloy; Ingots (for Remelting).

References.—Methods of testing, general requirements for metals, *see* 600.1, 641.0.

643.4 COPPER-TIN-ZINC ALLOY

American Society for Testing Materials, B 30-44T; 1944. Tentative Specifications for Copper-Base Alloys in Ingot Form for Sand Castings. Covers 25 copper-base alloys, with A.S.T.M. classifications, numerical and commercial designations, and nominal compositions. Manufacture, chemical composition, samples for analysis, chemical analysis, marking, inspection, rejection and retesting, claims, and settlement of claims. Endorsed by American Foundrymen's Assn.

American Society for Testing Materials, B 124-44T; 1944. Tentative Specifications for Copper-Base Alloy Forging Rods, Bars, and Shapes. Covers 12 alloys for hot forging. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tolerances, workmanship and finish, inspection, rejection, and probable range of physical properties of forgings, as forged.

References.— Other copper-tin-zinc alloys, *see* 646, methods of testing, general requirements for metals, *see* 600.1, 641.0.

643.5 COPPER-NICKEL ALLOY

U. S. Gov., Navy Dept. Specification 44T38; 1939. Tubing; Nickel-Copper-Alloy, Seamless and Welded.

U. S. Gov., Navy Dept. Specification 44T40; 1940. Tubing; Copper-Nickel-Alloy (70:30), Seamless.

U. S. Gov., Navy Dept. Specification 46C6a; 1942. Copper-Nickel-Alloy (70:30); Bars, Plates, Rods, Sheets, and Strips.

References.—Monel metal and nickel-copper alloys, *see* 654.

643.6 COPPER-NICKEL-ZINC ALLOY

American Society for Testing Materials, B151-44T; 1944. Tentative Specifications for Copper-Nickel-Zinc Alloy Rod, Bar, and Wire. Covers round, rectangular, square, hexagonal, or octagonal sections in three alloys, i.e., for general use; for use generally in hard or spring temper; and for use where ease of machining is important. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tempers of cold-drawn and annealed, tensile properties of drawn tempers, grain size of annealed tempers, number of tests, methods of testing, tolerances, finish, inspection, and rejection.

References.—Nickel silver, German silver, nickel-copper-zinc alloys, *see* 655.

643.7 COPPER-BEARING METALS

American Society for Testing Materials, B 100-44; 1944. American Assn. of State Highway Officials, M108-44. Rolled Copper-Alloy Bearing and Expansion Plates for Bridge and Other Structural Uses. For use where motion is slow and intermittent, and pressure does not exceed 3,000 psi. Gives requirements for two grades of alloy, manufacture, chemical analysis, physical properties, methods of testing, thickness and weight tolerances, finish, inspection, and rejection.

References.—Bearing metals other than babbitt metal, *see* 692.2.

643.9 MISCELLANEOUS COPPER ALLOYS

American Society for Testing Materials, B120-41T; 1941. Tentative Specifications for Beryllium-Copper Alloy Bars, Rods, Sheet, Strip, and Wire. Cover rods, bars, sheet, strip, and wire with a nominal beryllium content of 2.05 percent. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, condition or temper, mechanical properties, number of tests, retests, methods of testing, tolerances, finish, inspection, rejection, and appendix.

American Society for Testing Materials, B 171-42T; 1942. A.S.M.E. Boiler Construction Code Specification SB-171. Tentative Specifications for Copper-Alloy Condenser Tube Plates. Covers rolled plates of five types of copper alloys, for use as tube plates in surface condensers and heat exchangers. Gives manufacture, chemical composition, tensile and bending properties, testing, tolerances, workmanship and finish, marking, and inspection. A.S.T.M. Emergency Alternate Provision EA-B 171: 1942, affected section 3, Manufacture.

Society of Automotive Engineers. Aeronautical Material Specification 4650A; 1941. Beryllium-Copper Alloy; Wrought. Gives requirements for form (rods, bars, forgings, or as ordered), composition, condition, quality, tolerances, length, reports, and rejections. Similar specifications: Army 11070, Type I, Condition H; A.S.T.M.-B-120-40 T, Condition H.

U. S. Gov., Army Air Forces. Specification 11070-A (1); 1940. Beryllium—Copper; Bars, Rods, Sheets, Strips and Wire.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Ounce Metal, Sample 124a. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Navy Dept. Specification 44T23a; 1938. Tubing; Copper-Silicon-Bronze; Round, Seamless.

U. S. Gov., Navy Dept. Specification 46N5a; 1941. Nickel-Copper-Aluminum-Alloy; Forgings, Rods, Strips, and Wire.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-171; 1923. Metal; Gilding, Rod, Bar, Shape, Plate, Sheet, and Strip.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-171-1B; 1941. Metal; Gilding, Sheet, Strip, and Coil.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-171-2; 1939. Metal; Gilding, 95/5 Brass, Sheets and Strips.

References.—Silver solder, *see* 693.3.

644. BRASS

644.0 GENERAL ITEMS

American Society for Testing Materials, E 33-42; 1942. Hardness Conversion Table for Cartridge Brass (Relationship Between Diamond Pyramid Hardness, Rockwell Hardness, and Brinell Hardness). This conversion table presents data on the relationship among diamond pyramid hardness, Rockwell hardness, and Brinell hardness for cartridge brass. Recommended uses of table.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Brasses. Covers definition, characteristics, classes and physical properties, wrought alloys, constants (general), uses, forms available, and ordering instructions.

644.1 BRASS INGOTS AND BARS

644.11 Ingots, Brass

American Society for Testing Materials, B30-44T; 1944. Tentative Specifications for Copper-Base Alloys in Ingot Form for Sand Castings. Covers 25 copper-base alloys, with A.S.T.M. classifications, numerical and commercial designations, and nominal compositions. Manufacture, chemical composition, samples for analysis, chemical analysis, marking, inspection, rejection and retesting, claims and settlement of claims. Endorsed by American Foundrymen's Assn.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Red Brass, Designation 4A. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specifications QQ-B-701 (No. 2) and QQ-B-691a (No. 2); A.S.T.M. Specification B30-40T (4A); and S.A.E. Specification No. 40. Nominal chemical composition of this alloy is copper 85.00, tin 5.00, lead 5.00, zinc 5.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Red Brass, Designation 4B. Gives chemical analysis and physical properties of the alloy. This standard is similar to A.S.T.M. Specification B30-40T (4B). Nominal chemical composition of this alloy is copper 83.00, tin 4.00, lead 6.00, zinc 7.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Semi-Red Brass, Designation 5A. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specifications QQ-B-691a (No. 4) and QQ-B-701 (No. 4); and A.S.T.M. Specification B30-40T (5A). Nominal chemical composition of this alloy is copper 81.00, tin 3.00, lead 7.00, zinc 9.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Semi-Red Brass, Designation 5B. Gives chemical analysis and physical properties of the alloy. This standard if similar to A.S.T.M. Specification B30-40T (5B). Nominal chemical composition of this alloy is copper 76.00, tin 3.00, lead 6.00, zinc 15.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Yellow Brass, Designation 6A. Gives chemical analysis and physical properties of the alloy. This standard is similar to A.S.T.M. Specification B30-40T (6A). Nominal chemical composition of this alloy is copper 71.00, tin 1.00, lead 3.00, zinc 25.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Yellow Brass, Designation 6B. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specification QQ-B-621 (Grade B); A.S.T.M. Specification B30-40T (6B); and S.A.E. Specification No. 41. Nominal chemical composition of this alloy is copper 66.00, tin 1.00, lead 3.00, zinc 30.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Yellow Brass, Designation 6C. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specification QQ-B-621 A; and A.S.T.M. Specification B30-40 T (6C). Nominal chemical composition of this alloy is copper 60.00, tin 1.00, lead 1.00, zinc 37.85.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded High Strength Yellow Brass (Manganese Bronze), Designation 7A. Gives chemical analysis and physical properties of the alloy. This standard is similar to A.S.T.M. Specification B30-40T (7A). Nominal chemical composition of this alloy is copper 59.00, zinc 37.50, etc.

Non-Ferrous Ingot Metal Institute. 1940 Manual. High Strength Yellow Brass (Manganese Bronze), Designation 8A. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specifications QQ-B-726a and QQ-B-731a; A.S.T.M. Specification B30-40T (8A); and S.A.E. Specification No. 43. Nominal chemical composition of this alloy is copper 58.00, zinc 39.25, etc.

Non-Ferrous Ingot Metal Institute. 1940 Manual. High Strength Yellow Brass (Manganese Bronze), Designation 8B. Gives chemical analysis and physical properties of the alloy. This standard is similar to A.S.T.M. Specification B30-40T (8B). Nominal chemical composition of this alloy is copper 62.00, zinc 26.50, iron 3.00, aluminum 5.00, manganese 3.50.

References.—Brazing solder ingots, *see* 693.2.

644.12 Bars, Brass

Society of Automotive Engineers. Aeronautical Material Specification 4610B; 1944. Brass Rods and Bars; Free Cutting, Half Hard. Covers composition, tensile strength, yield point, elongation, quality, tolerances, reports, identification, and rejections. Similar Specifications: Federal QQ-B-611, Composition E, Half Hard; Naval Aircraft Factory EMS41; A.S.T.M. B16-42; and S.A.E. 72.

American Society for Testing Materials, B 19-44T; 1944. Tentative Specifications for Cartridge Brass Sheet, Strip, Plate, Bar, and Disks. For manufacture of ammunition or component parts thereof. Gives requirements for basis of purchase, manufacture, chemical composition, tempers of rolled and annealed brass, tensile strength, hardness, grain size, methods of testing, tolerances, finish, packing, marking, and rejection.

American Society for Testing Materials, B 124-44T; 1944. Tentative Specifications for Copper-Base Alloy Forging Rods, Bars, and Shapes. Covers 12 alloys for hot forging. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tolerances, workmanship and finish, inspection, rejection, and probable range of physical properties of forgings, as forged.

American Society for Testing Materials, B 140-43; 1943. Leaded Red Brass (Hardware Bronze) Rods, Bars, and Shapes. Covers two types, suitable for screw machine work. Gives requirements for basis of purchase, manufacture, chemical composition, chemical analysis, tensile properties, test specimens, number of tests, tolerances, lengths, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4611; 1942. Naval Brass Rods and Bars (Half-Hard). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections. Similar specifications: Federal QQ-B-636, Types I and II, Half-Hard; Navy 46B6, Types I and II, Half-Hard; S.A.E. 73, Half-Hard; A.S.T.M. B21-40T, Grade A, Half-Hard.

Society of Automotive Engineers. Aeronautical Material Specification 4612; 1941. Naval Brass, Rods, and Bars (Hard). Covers requirements for composition, condition, quality, tolerance, reports, identification, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specification 73—Naval Brass Rods, Bars, and Shapes. Covers composition in percentage, general information, mechanical requirements, strain test, bend test, dimensions, and tolerances, general information, and uses.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-B-646-1; 1944. Brass; Rolled, Bar-and-Rod (for Turnbuckle Barrels).

U. S. Gov., Federal Specification QQ-B-611a; 1938. Amendment 4; 1944. Brass; Commercial, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes bars in three compositions—(A) for forging; (B) free-cutting; and (D) free-cutting. Gives material, workmanship, chemical requirements, physical requirements, and permissible variations; methods of sampling, inspection, and test; and packing and marking.

U. S. Gov., Federal Specification QQ-B-636a; 1944. Brass; Naval, Bars, Plates, Rods, Shapes, Sheets, and Strips. Covers three classes—A, B, and C. Includes soft, half-hard, hard, and extruded brass.

Gives requirements for material, workmanship, chemical requirements, tensile requirements, physical requirements, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46B6k; 1944. Brass; Naval, Wrought: Bars, Forgings, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 47B2g; 1940. Brass; Commercial Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; brass shapes, *see* 644.22; brass rods, *see* 645.11; brass brazing rods, *see* 693.2.

644.2 BRASS PLATES, SHEETS, SHAPES, AND STRIPS

644.21 Plates and Sheets, Brass

American Society for Testing Materials, B 19-44T; 1944. Tentative Specifications for Cartridge Brass Sheet, Strip, Plate, Bar, and Disks. For manufacture of ammunition or component parts thereof. Gives requirements for basis of purchase, manufacture, chemical composition, tempers of rolled and annealed brass, tensile strength, hardness, grain size, methods of testing, tolerances, finish, packing, marking, and rejection.

American Society for Testing Materials, B36-44T; 1944. Tentative Specifications for Brass Sheet and Strip. Includes eight alloys of copper and zinc, annealed or tempered to suit. Gives requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tempers of rolled and annealed sheet and strip, tensile strength and Rockwell hardness of rolled tempers, grain size, Rockwell hardness of annealed tempers, number of tests, methods of testing, tolerances, finish, inspection, and rejection.

American Society for Testing Materials, B 121-44T; 1944. Tentative Specifications for Leaded Brass Sheet and Strip. Covers six alloys, with nominal compositions, annealed or tempered to suit. Give requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tempers of rolled sheet and strip, tempers of annealed sheet and strip, tensile strength of rolled tempers, tensile strength and Rockwell hardness of rolled tempers, grain size and Rockwell hardness of annealed tempers, number of tests, methods of test, tolerances, acceptable short lengths, finish, inspection, and rejection.

Copper and Brass Research Assn. Flat Products Standards FP-1 to FP-7, inclusive, 1944. Covers rolled flat products, cold rolled, thickness tolerances; rolled flat products, length, width and straightness tolerances; rolled flat products, copper sheet and strip rolled to weight; rolled flat products, circles and half circles, diameter tolerances; rolled flat products, hot rolled plates and sheets, weight tolerances; silicon bronze (copper-silicon alloy) A.S.M.E. code tank plates and sheets, weight and thickness tolerances; and drawn strip, bar and flat wire, thickness and width tolerances; rolled flat products, condenser tube plates, tolerances, thickness, diameter, length or width, and flatness.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. High-Brass Sheet. Covers definition, constants, uses, and specifications.

Society of Automotive Engineers. Aeronautical Material Specification 4505A; 1942. Brass Sheet and Strips; Annealed. Gives requirements for composition, condition, hardness, quality, tolerances, reports, and rejections. Similar specifications: Federal QQ-B-611, Composition E; A. S. T. M. B36-41T, Alloy No. 6; S.A.E. 70, Grade A.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S. A. E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 70—Commercial Brass Sheet and No. 79—Red Brass Sheet. Covers general information, physical properties, Rockwell hardness, ultimate strength, straightness tolerances, and length tolerances.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement; 1944. Standard Samples. Brass; Sheet, Sample 37c. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material

U. S. Gov., Federal Specification QQ-B-611a; 1938. Amendment 4; 1944. Brass; Commercial, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes plates and sheets in three compositions—C, D, and E, in various tempers. Gives material, workmanship, chemical requirements, physical requirements, and permissible variations; methods of sampling, inspection, and test; and packing and marking.

U. S. Gov., Federal Specification QQ-B-636a; 1944. Brass; Naval, Bars, Plates, Rods, Shapes, Sheets, and Strips. Covers three classes—A, B, and C. Includes soft, half-hard, hard, and as extruded brass. Gives requirements for material, workmanship, chemical requirements, tensile requirements, physical requirements, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46B6k; 1944. Brass; Naval, Wrought: Bars, Forgings, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 47B2g; 1940. Brass; Commercial Bars, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 47B3; 1941. Brass; Rolled, Plates (Admiralty Metal).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-160; 1923. Sheet and Strip; Brass, Low and Rich Low.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; thickness tolerances, *see* 640.1.

644.22 Shapes, Brass

American Society for Testing Materials, B 124-44 T; 1944. Tentative Specifications for Copper-Base Alloy Forging Rods, Bars, and Shapes. Covers 12 alloys for hot forging. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tolerances, workmanship, and finish; inspection, rejection, and probable range of physical properties of forgings, as forged.

American Society for Testing Materials, B140-43; 1943. Leaded Red Brass (Hardware Bronze) Rods, Bars, and Shapes. Covers two types, suitable for screw machine work. Gives requirements for basis of purchase, manufacture, chemical composition, chemical analysis, tensile properties, test specimens, number of tests, tolerances, lengths, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S. A. E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 73—Naval Brass Rods, Bars and Shapes. Covers composition in percentage, general information, mechanical requirements, strain test, bend test, dimensions and tolerances, general information, and uses.

U. S. Gov., Federal Specification QQ-B-611a; 1938. Amendment 4; 1944. Brass; Commercial, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes shapes in four compositions—(A) for forging; (B) soft, free cutting; (C) various tempers; and (D) free cutting. Gives material, workmanship, chemical requirements, physical requirements, and permissible variations; methods of sampling, inspection, and test; and packing and marking.

U. S. Gov., Federal Specification QQ-B-636a; 1944. Brass; Naval, Bars, Plates, Rods, Shapes, Sheets, and Strips. Covers three classes—A, B, and C. Includes soft, half-hard, hard, and as extruded brass. Gives requirements for material, workmanship, chemical requirements, tensile requirements, physical requirements, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46B6k; 1944. Brass; Naval, Wrought: Bars, Forgings, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 47B2g; 1940. Brass; Commercial Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; brass bars and rods, *see* 644.12, 645.11.

644.23 Strips, Brass

American Society for Testing Materials, B 19-44T; 1944. Tentative Specifications for Cartridge Brass Sheet, Strip, Plate, Bar, and Disks. For manufacture of ammunition or component parts thereof. Gives requirements for basis of purchase, manufacture, chemical composition, tempers of rolled and annealed brass, tensile strength, hardness, grain size, methods of testing, tolerances, finish, packing, marking, and rejection.

American Society for Testing Materials, B-36-44T; 1944. Tentative Specifications for Brass Sheet and Strip. Includes eight alloys of copper and zinc, annealed or tempered to suit. Gives requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tempers of rolled and annealed sheet and strip, tensile strength and Rockwell hardness of rolled tempers, grain size, Rockwell hardness of annealed tempers, number of tests, methods of testing, tolerances, finish, inspection, and rejection.

American Society for Testing Materials, B 121-44T; 1944. Tentative Specifications for Leaded Brass Sheet and Strip. Cover six alloys, with nominal compositions, annealed or tempered to suit. Gives requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tempers of rolled sheet and strip, tempers of annealed sheet and strip, tensile strength of rolled tempers, tensile strength and Rockwell hardness of rolled tempers, grain size and Rockwell hardness of annealed tempers, number of tests, methods of test, tolerances, acceptable short lengths, finish, inspection, and rejection.

American Society for Testing Materials, B 130-44T; 1944. Tentative Specifications for Gilding Metal Strip. For manufacture of bullet jacket cups and ammunition components. Gives requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis and for physical testing, tempers of rolled and annealed sheet and strip, tensile strength and hardness of rolled tempers, grain size and tension tests of annealed tempers, methods of testing, tolerances, workmanship and finish, packing, marking, inspection, and rejection.

Copper and Brass Research Assn. Sheet and Strip Metal, 1939. For metal in sheets, strips, and coils; tolerances for length, slit metal, squared, sheared, and sawed metal widths; and straightness tolerances applicable to slit metal.

Society of Automotive Engineers. Aeronautical Material Specification 4505 A; 1942. Brass Sheet and Strips; Annealed. Gives requirements for composition, condition, hardness, quality, tolerances, reports, and rejections. Similar specifications: Federal QQ-B-611, Composition E; A.S.T.M. B36-41T, Alloy No. 6; S.A.E. 70, Grade A.

U. S. Gov., Federal Specification QQ-B-611a; 1938. Amendment 4; 1944. Brass; Commercial, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes strips in three compositions—C, D, and E, in various tempers. Gives material, workmanship, chemical requirements, physical requirements, and permissible variations; methods of sampling, inspection, and test; and packing and marking.

U. S. Gov., Federal Specification QQ-B-636a; 1944. Brass; Naval, Bars, Plates, Rods, Shapes, Sheets, and Strips. Covers three classes—A, B, and C. Includes soft, half-hard, hard, and as extruded brass. Gives requirements for material, workmanship, chemical requirements, tensile requirements, physical requirements, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-B-50; 1944. Brass; Cartridge, Sheet and Strip.

U. S. Gov., Navy Dept. Specification 46B6k; 1944. Brass; Naval, Wrought: Bars, Forgings, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 47B2g; 1940. Brass; Commercial Bars, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-160; 1923. Sheet and Strip; Brass, Low and Rich Low.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-161-3; 1944. Brass; Leaded, Strip.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; thickness tolerances, *see* 640.1; standard gage and thicknesses, *see* 644.21.

645. MANUFACTURES OF BRASS

645.1 BRASS RODS AND WIRES

645.11 Rods, Brass

American Society for Testing Materials, B 16-44; 1944. Society of Automotive Engineers Specification No. 72. American Standards Assn. H8.1-1944. Free-Cutting Brass Rod and Bar for Use in Screw Machines. Gives manufacture, chemical composition, chemical analysis, check analysis, tensile properties, bending properties, test specimens, number of tests, methods of testing, dimensional tolerances, length, finish, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-B16; 1944, affected section 4, Chemical Analysis.

American Society for Testing Materials, B 21-44T; 1944. Tentative Specifications for Naval Brass Rods, Bars, and Shapes. Includes grade A for structural purposes for rods, bolts, etc., and grades B and C for free-cutting, each capable of being forged hot. Requirements for manufacture, chemical compositions, tensile and bending properties, mercurous nitrate test, test specimens, dimensional tolerances, and workmanship.

American Society for Testing Materials, B 124-44T; 1944. Tentative Specifications for Copper-Base Alloy Forging Rods, Bars, and Shapes. Covers 12 alloys for hot forging. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tolerances, workmanship and finish, inspection, rejection, and probable range of physical properties of forgings, as forged.

Copper and Brass Research Assn. Rod, Wire, Shapes Standards ROD-1 to ROD-3-A, inclusive, 1944. Covers rod and wire, diameter tolerances, extruded rod, bar and wire, diameter tolerances, hot rolled round rod and wire, diameter tolerances; drawn rod and bar, drawn strip and drawn flat wire, shapes length tolerances and schedule of short lengths; drawn rod and bar, drawn strip and drawn flat wire, shapes straightness tolerances.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Brass Rod; High-Speed. Covers definition, forms available, uses, and specifications.

Society of Automotive Engineers. Aeronautical Material Specification 4610B; 1944. Brass Rods and Bars; Free Cutting, Half Hard. Covers composition, tensile strength, yield point, elongation, quality, tolerances, reports, identification, and rejections. Similar Specifications: Federal QQ-B-611, Composition B, Half Hard; Naval Aircraft Factory EMS41; A.S.T.M. B16-42; and S.A.E. 72.

Society of Automotive Engineers. Aeronautical Material Specification 4611; 1942. Naval Brass Rods and Bars (Half-Hard). Gives requirements for composition, condition, quality, tolerances, reports, identification, and rejections. Similar specifications: Federal QQ-B-636, Types I and II, Half-Hard; Navy 46B6, Types I and II, Half-Hard; S.A.E. 73, Half-Hard; A. S. T. M. B21-40T, Grade A, Half-Hard.

Society of Automotive Engineers. Aeronautical Material Specification 4612; 1941. Naval Brass; Rods and Bars (Hard). Covers requirements for composition, condition, quality, tolerance, reports, identification, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S. A. E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 72—Free Cutting Brass Rod and No. 88—Brass Forging Rod. Covers composition in percentage, general information, physical properties, bend tests, and dimensions and tolerances.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S. A. E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 73—Naval Brass Rods, Bars, and Shapes. Covers composition in percentage, general information, mechanical requirements, strain test, bend test, dimensions and tolerances, general information, and uses.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-B-646-1; 1944. Brass; Rolled, Bar-and-Rod (for Turnbuckle Barrels).

U. S. Gov., Federal Specification QQ-B-611a; 1938. Amendment 4; 1944. Brass; Commercial, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes rods in three compositions—(A) for forging; (B) soft and half-hard, free cutting; and (D) free cutting. Gives material, workmanship, chemical requirements, physical requirements, and permissible variations; methods of sampling, inspection, and test; and packing and marking.

U. S. Gov., Federal Specification QQ-B-636a; 1944. Brass; Naval, Bars, Plates, Rods, Shapes, Sheets, and Strips. Covers three classes—A, B, and C. Includes soft, half-hard, hard, and as extruded brass. Gives requirements for material, workmanship, chemical requirements, tensile requirements, physical requirements, and permissible variations; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification QQ-R-571; 1932. Rods; Welding, Nonferrous (for) Gas Welding. Includes type B, naval brass; and type C, copper. Gives requirements for chemical composition, weldability, character of weld metal, physical properties, sizes, and lengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 46B6k; 1944. Brass; Naval, Wrought: Bars, Forgings, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 46R1b; 1933. Rods; Welding, Nonferrous (for Gas Welding).

U. S. Gov., Navy Dept. Specification 47B2g; 1940. Brass; Commerical Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; welding apparatus and practice, *see* 767; welding wire, brass, *see* 645.12; brass brazing solder, *see* 693.2.

645.12 Wires, Brass

American Society for Testing Materials, B 134-44T; 1944. Tentative Specifications for Brass Wire. Covers eight alloys for commerical brass wire. Basis of purchase, manufacture, chemical compositions, sampling for chemical analysis, tempers of drawn and annealed wire, tensile properties of drawn tempers, grain size of annealed tempers, number of tension tests, methods of testing, diameter, tolerances, length, finish, inspection, and rejection.

Copper and Brass Research Assn. Rod, Wire, Shapes Standards ROD-1 to ROD-3-A inclusive, 1944. Covers rod and wire, diameter tolerances, extruded rod, bar and wire, diameter tolerances, hot rolled round rod and wire, diameter tolerances; drawn rod and bar, drawn strip and drawn flat wire, shapes length tolerances and schedule of short lengths, drawn rod and bar, drawn strip and drawn flat wire, shapes straightness tolerances.

Society of Automotive Engineers. Aeronautical Material Specification 4710; 1942. Brass Wire; Tinned. Gives requirements for composition, condition, quality, tolerances, reports, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specifications No. 80 and No. 82—Brass Wire. Covers composition in percentage, tensile strength, bend test, tempers, appearance, and dimensional tolerances.

U. S. Gov., Army Air Forces. Specification 10285-A (3); 1943. Wire; Metal, Spray Gun.

U. S. Gov., Federal Specification QQ-W-321; 1930. Wire; Brass. Covers three grades—(A) annealed, soft; (B) as drawn; and (C) spring temper. Gives requirements for material and workmanship, diameter of wire, chemical composition, and physical requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 48-12; 1925. Wire; Eyelet, Submarine Gas Mask.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-217A; 1939. Wire; Low Brass, Arming Wire.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; brass brazing wire, *see* 692.3.

645.2 BRASS CASTINGS, FERRULES, PIPES, AND TUBES

645.21 Castings, Brass

American Society of Mechanical Engineers, joint sponsor with American Gear Manufacturers' Assn. American Standards Assn., B 6.2-1933. Gear Materials and Blanks. These specifications are for forged and rolled carbon steel, steel castings, bronze and brass castings, and forged and rolled alloy steel. Recommendations cover—manufacture, ladle, and check analyses, finish, marking, inspection, etc. Also included are tables on chemical composition for each type of material.

American Society for Testing Materials, B 62-44; 1944. A. S. M. E. Boiler Construction Code Specification SB-62. Composition Brass or Ounce Metal Castings. Commercially known as composition metal, 85-5-5-5, or ounce metal. Gives basis of purchase, manufacture, chemical composition and analysis, tensile properties, test specimens, number of tests, workmanship and finish, marking, inspection, certification, and rejection. Endorsed by the American Foundrymen's Assn. A. S. T. M. Emergency Alternate Provision EA-B 62b; 1944, affected section 7, Test Specimens, and adds figures 3 and 4.

American Society for Testing Materials, B 119-40T; 1940. Tentative Classification of Cast Copper-Base Alloys. Defines copper alloys as containing not over 2 percent of other elements, brass as having an appreciable amount of zinc, and bronze as having more of other alloying elements than zinc. Includes copper, 13 brasses, and 9 bronzes. Endorsed by the American Foundrymen's Assn.

American Society for Testing Materials, B 145-44T; 1944. Tentative Specifications for Leaded Red Brass and Leaded Semi-Red Brass Sand Castings. Cover castings for four alloys. Gives basis of purchase, manufacture, chemical composition and analysis, methods of chemical analysis, tensile properties, pressure and fracture tests, test specimens, number of tests, methods of testing, workmanship and finish, marking, inspection, certification, and rejection. A. S. T. M. Emergency Alternate Provision EA-B 145; 1944, affected section 9, Test Specimens, and added figures 3 and 4.

American Society for Testing Materials, B 146-44T; 1944. Tentative Specifications for Leaded Yellow Brass Sand Castings for General Purposes. Covers castings of three alloys. Gives basis of purchase, manufacture, chemical composition and analysis, methods of chemical analysis, tensile properties, pressure and fracture tests, test specimens, number of tests, methods of testing, workmanship and finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-B 146; 1944, affected section 9, Test Specimens, and adds figures 3 and 4.

American Society for Testing Materials, B147-44T; 1944. Tentative Specifications for High-Strength Yellow Brass and High-Strength Leaded Yellow Brass Sand Castings. Covers castings of three alloys. Basis of purchase, manufacture, chemical composition, chemical analysis, methods of chemical analysis, tensile properties, test specimens, number of tests, methods of testing, workmanship and finish, marking, inspection, and rejection.

American Society for Testing Materials, B 176-42 T; 1942. Tentative Specifications for Copper-Base (Brass) Alloy Die Castings. Covers two brass alloy compositions for commercial die castings. Manufacture, chemical composition, sampling, physical properties, test specimens, soundness, finish, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 2560A; 1942. Impregnation of

Castings. To make porous castings pressure tight by suitable cleaning of castings, extraction of air from the porous sections by vacuum, pressure filling the evacuated pores with tung oil, and subsequent polymerization and swelling of the oil retained by the pores. Optional processes permitted. Includes preparation of castings, requirements for materials, impregnation procedure, and identification.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Brass and Bronze Castings, revised 1944. Gives specification No.40—Red Brass Castings, No.41—Yellow Brass Castings, and No.44—Cast Brass To Be Brazed. Covers composition in percentages, general information, and uses.

U. S. Gov., Federal Specification QQ-B-601; 1932. Amendment 1; 1942. Brass; Castings (To Be Brazed). Covers two grades—(A) and (B). Gives requirements for material, workmanship, quality, repairing of defects, chemical composition, and physical properties; methods of inspection and tests; and requirements for packing and marking.

U. S. Gov., Federal Specification QQ-B-621a; 1943. Brass; Commercial-Yellow, High-Copper-Yellow, and Naval, Castings. Covers three compositions—(A) naval brass, (B) commercial yellow brass, and (C) high-copper-yellow brass. Gives requirements for material, workmanship, dimensions, chemical requirements, and tensile requirements; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 10S1a; 1944. Strainers; Gasoline, for Motor Boats.

U. S. Gov., Navy Dept. Specification 46B10g; 1943. Brass; Naval (Composition N-c), Castings.

U. S. Gov., Navy Dept. Specification 46B11g; 1943. Brass; Commercial, Castings.

References.—Methods of testing, general requirements for metals, *see* 600.1; brass fittings and plumbing fixtures, *see* 645.4; brass valves and hydrants, *see* 607.6; brass builders hardware, *see* 645.6; bronze castings, *see* 646.41; brass telephone plugs, jacks, *see* 718.29; other specifications for brass castings, *see* specifications of individual commodities made of cast brass.

645.22 Ferrules, Brass

American Society for Testing Materials, B111-43; 1943. A.S.M.E. Boiler Construction Code Specification SB-111. Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock. For use in surface condensers, evaporators, and heat exchangers. Gives requirements for material, manufacture, chemical composition, sample for chemical analysis, microscopic examination, expanding test, mercurous nitrate test, hydrostatic test, dimension and weight tolerances, workmanship, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-B-111; 1942, affected section 3, Material.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; ferrule stock, *see* 645.24.

645.23 Pipes, Brass

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Brass Pipes and Tubes (Seamless). Include rules for inspection and tests.

American Society for Testing Materials, B 43-42; 1942. A.S.M.E. Boiler Construction Code Specification SB-43. Brass Pipe; Standard Sizes. Covers seamless Muntz metal, high brass, admiralty metal, and red brass pipe suitable for use in plumbing, boiler feed lines, and for similar purposes. Basis of purchase; manufacture, condition or temper, chemical composition, expansion, strain, and hydrostatic tests; bending properties, dimensions and weights, tolerances, workmanship, finish, inspection, and rejection.

Copper and Brass Research Assn. Round Seamless Tubes, 1939. Includes copper water tube, brass and copper pipe, condenser and other heat exchanger tubes; gage or wall thickness tolerances for refractory and nonrefractory alloys, mean diameter tolerances, length tolerances, weight tolerances, and estimating data for condenser and other heat exchanger tubes.

Copper and Brass Research Assn. Tube, Pipe Standards TUBE-1 to TUBE-8 inclusive, 1944. Covers round seamless tubes, wall thickness and diameter tolerances; round seamless tubes, length tolerances, straightness tolerances; copper water tube, standard dimensions and weights, diameter and wall thickness tolerances, weight tolerances; pipe, dimensions and weights, weight and wall thickness tolerances; condenser and other heat exchanger tubes, dimensions and weight tolerances; and condenser and other heat exchanger tubes, estimating data.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pipe and Tubes; Brass. Covers definition, nominal composition, sizes, uses, and marketing customs.

U. S. Gov., Federal Specification WW-N-351; 1930. Amendment 1; 1936. Nipples; Pipe, Brass, Steel, and Wrought Iron. Covers coated and uncoated nipples, in iron pipe sizes from 1/8 to 12 in., of standard lengths; brass nipples in iron pipe sizes from 1/8 to 6 in.; and three types—(A) standard weight, (B) extra strong, and (C) double extra strong. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-P-351; 1930. Pipe; Brass, Seamless, Iron-Pipe Size, Standard and Extra Strong. Covers three grades—A, B, and C. Gives requirements for chemical composition, weights, dimensions, and sizes; method of sampling, inspection, and tests; and requirements for packing and marking for shipment

U. S. Gov., Navy Dept. Specification 44P12c; 1935. Pipe; Brass, Seamless, Iron Pipe Size, Standard-Weight and Extra Strong.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for seamless brass pipe muntz metal, high brass, admiralty metal, and red brass suitable for steam, water, compressed air, sanitary, and boiler-feed lines, and for similar purposes subject to temperatures not exceeding 406° F.); process, temper, chemical composition, tests, bending properties, workmanship, finish, and rejection.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; pipe threads and pipe installation, *see* 607.0; brass tubes, *see* 645.24; gas fixture tubing and pipe, *see* 645.9; brass pipe nipples, *see* 607.4.

645.24 Tubes, Brass

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Brass Pipes and Tubes (Seamless). Include rules for inspection and tests.

American Society for Testing Materials, B 14-18; 1918. Seamless Brass Boiler Tubes. For locomotive boilers; requirements for manufacture, chemical composition, temper, flange test, flattening and doubling-over test, hydrostatic test, specimen, standard weights, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, B111-43; 1943. A.S.M.E. Boiler Construction Code Specification SB-111. Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock. For use in surface condensers, evaporators, and heat exchangers. Gives requirements for material, manufacture, chemical composition, sample for chemical analysis, microscopic examination, expanding test, mercurous nitrate test, hydrostatic test, dimension and weight tolerances, workmanship, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-B-111; 1942, affected section 3, Material.

American Society for Testing Materials, B135-43T; 1943. Tentative Specifications for Miscellaneous Brass Tubes. Covers five alloys for straight tubes. Gives requirements for manufacture, chemical compositions, sampling for chemical analysis, tempers of drawn tubes and annealed tubes, physical properties, expansion test, mercurous nitrate test, methods of testing, number of tests, weight, dimensional tolerances, workmanship, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-B 135; 1942, affected section 3, Manufacture.

Copper and Brass Research Assn. Tube, Pipe Standards TUBE-1 to TUBE-8 inclusive, 1944. Covers round seamless tubes, wall thickness and diameter tolerances; round seamless tubes, length tolerances, straightness tolerances; copper water tube, standard dimensions and weights, diameter and wall thickness tolerances, weight tolerances; pipe, dimensions and weights, weight and wall thickness tolerances; condenser and other heat exchanger tubes, dimensions and weight tolerances; and condenser and other heat exchanger tubes, estimating data.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pipe and Tubes; Brass. Covers definition, nominal composition, sizes, uses, and marketing customs.

Society of Automotive Engineers. Aeronautical Material Specification 4555; 1941. Brass Tubing, Light Annealed. Covers requirements for composition, condition, quality, tolerance, reports, identification, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specification No.74—Annealed Seamless Brass Tubing and No.76—Naval Brass Tubing. Covers composition in percentage, general information, tensile strength and hardness, expanding test, appearance, dimensional tolerances, and special limits.

U. S. Gov., Federal Specification WW-T-756a; 1943. Tubes; Condenser and Ferrule-Stock, Admiralty-Metal. Covers two types—(A) suitable for packing or expanding in tube sheets, and (B) for ferrule stock. Gives requirements for chemical composition and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification WW-T-791; 1931. Tubing; Brass, Seamless. Covers three grades—1, 2, and 3; and four types—(A) maximum nominal working pressure, 100 lb. per square inch; (B) 200 lb. per square inch; (C) 300 lb. per square inch; and (D) 450 lb. per square inch. Gives requirements for chemical composition, tolerances, permissible variations, weights, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 34T1e; 1934. Tubing; Voice, Flexible, Metallic.

U. S. Gov., Navy Dept. Specification 44T5e; 1943. Tubing; Voice, Brass and Steel.

U. S. Gov., Navy Dept. Specification 44T7g; 1943. Tubes, Condenser; and Tubing for Ferrule Stock, Admiralty Metal.

U. S. Gov., Navy Dept. Specification 44T15b; 1932. Tubing; Brass, Seamless, 100-450-Pounds-Working-Pressure (Square Inch).

U. S. Gov., Navy Dept. Specification 44T16b; 1944. Tubing; Brass, Seamless, for Pressures From 451 to 4,000 Pounds per Square Inch.

U. S. Gov., Navy Dept. Specification 45F10a; 1937. Fittings; Tube, Brass or Bronze.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-191; 1944. Brass, Leaded; Tubing, Round, Seamless.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; bronze tubes, *see* 646.42; brass pipe, *see* 645.23; flexible metallic hose, *see* 607.7; gas fixture tubing and pipe, *see* 645.0.

645.25 Pipe Fittings, Brass

American Society of Mechanical Engineers, joint sponsor with American Society of Sanitary Engineering. American Standards Assn., A 40.2-1936. Brass Fittings for Flared Copper Tubes. Presents detailed dimensional requirements for the brass fittings used on one type of joint to connect copper tubing. Fittings are designated for maximum cold water service pressure of 175 lb. per square inch gage. Also specified are materials, size, and threading.

References.—Brass pipe fittings, *see* 645.4.

645.3 BRASS-WIRE MANUFACTURES

645.31 Sieves, Brass

American Society for Testing Materials, E 11-39; 1939. American Assn. of State Highway Officials, M 92-42. American Standards Assn., Z23.1-1939. Sieves for Testing Purposes (Wire Cloth Sieves, Round-Hole and Square-Hole Screens or Sieves). For precision testing in classification of materials according to size, and method of calibrating wire cloth sieves. Construction of woven wire sieves of brass, bronze, or other suitable wire, standard 8- and 3-in. sieves, micron designations for fine series and nominal dimensions, permissible variations, and limits for fine and coarse series standard wire cloth sieves, label marking, plates, and frames for round-hole and square-hole sieves, and spacing of openings.

American Society for Testing Materials, E 13-42; 1942. Definition of the Term Screen (Sieve). Includes plate, or sheet, or woven cloth type.

U. S. Gov., Federal Specification RR-S-366; 1932. Sieves; Standard, Testing. Covers sieves with woven wire cloth having frames with a nominal diameter of 8 in. of two types—(A) full-height, and (B) half-height. Wire cloth shall be woven from brass, bronze, or other suitable noncorrosive wire. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 64S8a; 1943. Sieves; Flour.

U. S. Gov., Navy Dept. Specification 64S10b; 1943. Strainers; Pot.

References.—Other wire cloth, *see* 645.39, 603.43, 642.4.

645.32 Rings and Hooks, Brass and Bronze

Society of Automotive Engineers. Aeronautical Material Specification Nos. 7320 and 7322; 1940. Sealing Rings, Bronze Castings. Primarily for drilled oil seal rings but may be used for other purposes. Gives requirements for composition, hardness, quality, finish, reports, approval, and rejections.

References.--Door hooks and eyes, brass wire, *see* 617.63; coat hooks, brass, *see* 617.63; hooks, bronze (builders' hardware), *see* 617.63.

645.39 Miscellaneous Brass-Wire Manufactures

American Hospital Assn. 4-10. Wire Screen Cloth. Covers copper, commercial bronze (brass), bronze, iron or steel, galvanized (zinc coated), copper-nickel alloy, corrosion-resisting steel (chromium-nickel), aluminum alloy, iron or steel, japanned or painted, and chromium-nickel alloy. Based on U. S. Gov. Federal Specifications RR-C-541a for Wire Screen Cloth and QQ-M-151a for General Specification for Inspection of Metals.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S.A.E. Standard Wire Cloth, adopted 1924. Table of sizes and dimensions with tolerances and types of weave.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS36-33; 1933. Fourdrinier Cloth. The standard applies to one grade only of fourdrinier wire cloth—a flexible endless woven wire cloth used on paper-making machines. It establishes the number of wires in both directions for the several mesh classifications and the thickness of the wire. It further provides for inspection, labeling, and method of handling. An appendix includes recommendations of the manufacturers on the installation and use of the product. Sponsored by Wire Cloth Manufacturers Assn.

U. S. Gov., Federal Specification RR-C-451a; 1934. Amendment 4; 1944. Cloth; Wire, Screen. Covers four types, including type B—commercial bronze (brass). Gives requirements for material and workmanship, number of meshes per inch, diameter of wire, construction, length, width, and composition of wire; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, 1943. Hook; Double, 2 1/2-inch.

U. S. Gov., Marine Corps Specification, 1933. Keepers; Brass, for Dress Belts.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; other wire cloth, *see* 603.43, 642.4; brass sieves, *see* 645.31.

645.4 BRASS FITTINGS AND PLUMBING FIXTURES

American Society of Mechanical Engineers, sponsor. American Standards Assn., A40.3-1941. Soldered Joint Fittings. Covers certain dimensions of soldered-joint wrought metal and cast brass fittings for copper water tube, including—(1) detailed dimensions of the bore, (2) minimum specifications for materials, (3) minimum inside diameter of the fittings, (4) metal thickness for both wrought metal and cast brass fittings, and (5) general dimensions for cast brass fittings, including center-to-shoulder dimensions for both straight and reducing cast fittings. Due to the variety of methods used for forming wrought metal fittings, the laying length of these fittings (center-to-shoulder) is not given at this time.

Underwriters' Laboratories, Inc. Standard for Fittings for Automotive, Gas, Hazardous Liquid, and Refrigeration Applications, 1940. For connecting copper, brass, aluminum, and steel tubing. Covers design and construction of brass body and nut, flare type, compression fittings. Vibration, pull, and season-cracking test requirements.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R21-25; 1925. Brass Lavatory and Sink Traps. This recommendation establishes a schedule of sizes, styles, and gages of brass lavatory and sink traps. Initiated by manufacturers now represented by Tubular Plumbing Goods Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R185-42; 1942. Pipe Fittings (Grey Cast Iron, Malleable Iron, and Brass or Bronze). This recommendation covers the reduction of stock varieties to 35 percent of their former number. Sponsored by the Pipe Fittings Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS5-40; 1940. Pipe Nipples; Brass, Copper, Steel, and Wrought-Iron. This standard covers steel, ferrous-alloy, and wrought-iron nipples, black- and zinc-coated (hot dip galvanized), in iron-pipe sizes from 1/8 to 12 in., of standard length; and brass and copper nipples in standard sizes 1/8 to 6 in. Gives tables showing pipe sizes and various lengths, packaging, and labeling. Initiated by manufacturers, now represented by National Assn. of Pipe Nipples Manufacturers.

U. S. Gov., Federal Specification FF-H-136; 1936. Hardware and Fittings; (for) Lavatory Partitions and Inclosures. Covers hardware and fittings for lavatory stall and shower partitions and inclosures of marble, slate, or glass. Types for marine use are not included. Includes bolts, latches, screw fastenings, partition fittings, gravity and spring hinges, hooks, top and bottom partition standards, strikes, top rail and shower curtain rods and fittings. Gives requirements covering dimensions, illustrations, composition of material used, workmanship, fastenings, finish, and details; methods of inspection and tests; and packing and marking. Emergency Alternate Federal Specification E-FF-H-136; July 1943, changed requirements for material and finish in order to conserve metal, especially bronze.

U. S. Gov., Federal Specification WW-N-351; 1930. Amendment 1; 1936. Nipples; Pipe, Brass, Steel, and Wrought Iron. Covers coated and uncoated nipples, in iron pipe sizes from 1/8 to 12 in., of standard lengths; brass nipples in iron pipe sizes from 1/8 to 6 in.; and three types—(A) standard weight, (B) extra strong, and (C) double extra strong. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-P-448a; 1941. Pipe-Fittings; Brass or Bronze (Threaded or Brazed), 125-Pound. Covers bushings, caps, couplings, crosses, elbows, plugs, return bends, tees, and Y-branch, 45°, straight. Gives requirements for chemical composition and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-448a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) permitted additional compositions for material, changed requirements for type II, Packaging and Sizes.

U. S. Gov., Federal Specification WW-P-461a; 1942. Pipe-Fittings; Brass or Bronze (Threaded), 250-Pound. Covers couplings, crosses, elbows, and tees. Gives requirements for chemical composition and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-461a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) permitted additional compositions for material and changed requirements for packing and marking.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes unfinished brass downspout nozzles threaded for pipe connection into drainage elbow at base of downspout; requirements for inspection and tests of backflow and preventives used with flush valves, including three kinds of laboratory tests; requirements for chain stay for lavatories; for metal tumbler and tooth-brush holder with round cup and bracket having round wall flange; for metal toilet paper holders including brackets, rollers, dimensions, and sizes of the various types; for soap dishes for lavatories, wall attachment, and bathtubs; for metal and round cup pattern tumbler holder with bent bracket and round wall flange; for metal towel rack with tubular metal bar with metal brackets; for towel rack with glass rod and metal brackets with round wall flange; and for area drains of heavy cast iron for three and four inch drain pipe. Emergency Alternate Federal Specification E-WW-P-541a; 1942, changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

U. S. Gov., Navy Dept. Specification 30H2; 1940. Holders; Toilet-Accessory (Shipboard Use), Brush-and-Comb, Soap-Dish, Sponge; Towel; Toothbrush-Cup or Tumbler.

U. S. Gov., Navy Dept. Specification 33N1; 1936. Nozzles; Valve, Gasoline-Hose.

U. S. Gov., Navy Dept. Specification 45f2e; 1932. Fittings; Pipe, Brass or Bronze, Threaded, 125-Pound.

U. S. Gov., Navy Dept. Specification 45N3; 1941. Nipples; Pipe, Brass, Steel, and Wrought-Iron.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; nickel plating, *see* 600.3; brass valves, *see* 607.6; brass hose couplings and play pipes, *see* 974.2, 202; pipe nipples, *see* 607.4, 645.23.

645.5 BRASS OILERS

645.6 BRASS BUILDERS' HARDWARE

Plain Washer Manufacturers' Assn. Semi-Standard Washers, 1938. Includes round flat brass washers, outside and hole diameters, thickness of metal, and estimated number per pound. Also includes hollow countersunk type (brass, plain and nickel-plated); hollow flush type (brass, plain and nickel-plated), etc.

U. S. Gov., Navy Dept. Specification 43R4b; 1944. Rivets and Tap-Rivets; Nonferrous, for Hull Construction.

References.—Builders' hardware of brass, *see* 617.

645.9 MISCELLANEOUS MANUFACTURES OF BRASS

American Hospital Assn., 4-52. Safety Treads. Covers two types—(A) brass-base and (B) aluminum-base. Based on U. S. Navy Dept., Specifications 12T4f for Safety Treads, 46 A 1 for Aluminum Alloy, and 46 S-40 for Tool Carbon Steel.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for working stresses (tension, compression, shearing, bearing) of the cast, rolled, drawn, or extruded metals used.

American Society for Testing Materials, B 129-44T; 1944. Tentative Specifications for Cartridge Brass Cartridge Case Cups. For annealed brass; type I, for small arms cartridge case cups; and type II, for artillery cartridge case cups. Gives requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis, physical properties of sheet and strip, grain size, number of tests, methods of testing, tolerances, workmanship, packing, marking, inspection, and rejection.

American Society for Testing Materials, B 131-44T; 1944. Tentative Specifications for Gilding Metal Bullet Jacket Cups. For manufacture of bullet jackets; types I, II, III, and IV; and classes I, II, and III. Gives requirements for basis of purchase, manufacture, chemical composition, sampling, tensile properties, grain size, methods of testing, tolerances, workmanship, packing, marking, inspection, and rejection.

Pin, Clip and Fastener Assn. Paper Fastener Physical Standards. Covers gauges and diameters and widths of caps; gauges, widths and lengths of shank for available sizes of brass paper fasterners.

Pin, Clip and Fastener Assn. Physical Dimensions Brass and Steel Washers. Covers gauge, diameter, and slot dimensions of brass washers for use in connection with paper fasteners.

Pin, Clip and Fastener Assn. Safety Pin Physical Standards. Covers sizes, all-over lengths, and gauges of wire for safety pins classified as—10¢ grade guarded brass, and standard guarded and unguarded brass.

Pin, Clip and Fastener Assn. Straight Pin Physical Standards. Covers numbers, sizes, and counts for brass straight pins classified as—bank, dressmaker, silk, pleating, ribbon, and furrier.

Society of Automotive Engineers. Aeronautical Material Specification 4614B; 1942. Brass Forgings. Gives requirements for composition, condition, quality, reports, and rejections. Similar specifications: Federal QQ-B-611, Composition A; S.A.E. 88; A.S.T.M. B124-42T, Alloy No. 2.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-5; 1944. Nuts; Self-Locking.

U. S. Gov., Federal Specification FF-F-101; 1932. Fasteners; Paper, Brass. Covers two types—(I) flat head, and (II) round head. Gives requirements for material and workmanship; length, other dimensions, and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification FF-S-111; 1931. Screws; Wood. Covers three types—flat, oval, and round head. Gives requirements for measurements of length, of diameter, tolerances, and standard sizes; detail requirements; and methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types—(A) welded; two grades—(I) crane, wrought iron; and (II) proof coil, wrought iron, or open-hearth steel; and (B) weldless (steel, copper, brass, or bronze); six classes for type A—(1) close link; (2a) long link, buoy or submarine net; (2b) long link, conveyor or sprocket wheel; (3a) twist link, plain pattern; (3b) twist link, long-link pattern; and (3c) twist link, short-link pattern; twelve classes for type B—(1) single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link (long pitch), (4b) flat link (short pitch), (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass, for mechanical communications. Gives requirements for material, workmanship, weights, design, and dimensions,; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Joint Army-Navy Specification JAN-B-67; 1944. Brass; Cartridge, Disks.

U. S. Gov., Marine Corps Specification, 1936. Buckle; Friction, 5/8-Inch, for Leggings.

U. S. Gov., Marine Corps Specification, 1917. Buckles; Harness.

U. S. Gov., Marine Corps Specification, 1920. Buckle; Headstrap, Field Hat.

U. S. Gov., Marine Corps Specification, 1928. Buckle; 1 7/16-Inch, for Trousers Belt.

U. S. Gov., Marine Corps Specification, 1901. Carriage; Drumstick.

U. S. Gov., Marine Corps Specification, 1944. Clip; End, Ball Type.

U. S. Gov., Marine Corps Specification, 1943. Eyelet; Brass, Bronzed, for Leggings.

U. S. Gov., Marine Corps Specification, 1943. Eyelet; Long, Brass, Bronzed, for Legging Clip.

U. S. Gov., Marine Corps Specification, 1933. Ferrules, for Flagstaff.

U. S. Gov., Marine Corps Specification, 1943. Hook; Brass, Bronzed, for Leggings,

U. S. Gov., Marine Corps Specification, 1937. Plate; Waist, Plain.

U. S. Gov., Marine Corps Specification, 1933. Stencils; Brass (Complete with Brush, Ink, and Sponge).

U. S. Gov., Marine Corps Specification, 1938. Tip; Metal, for 1 3/8-Inch Webbing.

U. S. Gov., Navy Dept. Specification 12T4f; 1939. Treads; Safety.

U. S. Gov., Navy Dept. Specification 27B9a; 1941. Buckles.

U. S. Gov., Navy Dept. Specification 54S4a; 1940. Seals.

U. S. Gov., Treasury Dept., Procurement Div., No. 305; 1938. Washers; Brass. Shall be made of sheet brass, clean, bright, flat, smoothly punched, and without burrs. Give requirements for sizes, dimensions, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-101-9B; 1931. Metal Parts; Eyepiece, Gas Mask.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2563; 1939. Holder; Napkin.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-161-2A; 1943. Brass; Free-Machining, Forgings.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-171-3A; 1943. Cup; Bullet Jacket, Gilding Metal.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-17 -2C; 1943. Cup; Case, Cartridge, Brass.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-229A; 1942. Anode; Brass.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 83-2152; 1940. Case; Firing Device, Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-4106a; 1940. Plate; Name and Number, for Submarine Mine Material.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-30; 1931. Tray; Type PG-20 and PG-22, Pigeon.

References.—Methods of testing, general requirements for metals, see 600.1, 644.11; terminals and soldering lugs of brass, see 715.34, 715.35; brass telephone equipment, see 718.29; chemical fire extinguishers, brass, see 973.3; fuel tanks of brass for stoves and gas engines, see 956.2; brazing solder, brass, see 693.2; nails, spikes, tacks, and staples of brass and Muntz metal, see 608.1; brass padlocks, see 617.21; turnbuckles of brass, see 608.7; trolley ears, brass, see 719.63; brass paper fasteners, see 932.5; testing screens of brass, see 619.2.

646. BRONZE

646.0 GENERAL ITEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Ornamental and Miscellaneous Metal Work. Gives requirements for working stresses (tension, compression, shearing, bearing) of the cast, rolled, drawn, or extruded metals used.

American Society for Testing Materials, B 119-40T; 1940. Tentative Classification of Cast Copper-Base Alloys. Defines copper alloys as containing not over 2 percent of other elements, brass as having an appreciable amount of zinc, and bronze as having more of other alloying elements than zinc. Includes copper, 13 brasses, and 9 bronzes. Endorsed by the American Foundrymen's Assn.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Bronzes. Covers definition, characteristics, types and classes, physical properties, specifications, uses, and forms available.

646.1 BRONZE INGOTS AND BARS

646.11 Ingots, Bronze

American Society for Testing Materials, B30-44T; 1944. Tentative Specifications for Copper-Base Alloys in Ingot Form for Sand Castings. Covers 25 copper-base alloys, with A.S.T.M. classifications, numerical, and commercial designations, and nominal compositions. Manufacture, chemical composition, samples for analysis, chemical analysis, marking, inspection, rejection and retesting, claims and settlement of claims. Endorsed by American Foundrymen's Assn.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Tin Bronze, Designation 2A. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specifications QQ-B-691a (No.1) and QQ-B-701 (No.1); and A.S.T.M. Specification B30-40T (2A). Nominal chemical composition of this alloy is copper 88.00, tin 6.00, lead 1.50, zinc 4.50.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Tin Bronze, Designation 2B. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specifications QQ-B-691a (No. 6 and 6X) and QQ-B-701 (No. 6); A.S.T.M. Specification B30-40T (2B); and S.A.E. Specification No. 63. Nominal chemical composition of this alloy is copper 87.00, tin 10.00, lead 1.00, zinc 2.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. High Leaded Tin Bronze, Designation 3A. Gives chemical analysis and physical properties of the alloy. This standard is similar to A.S.T.M. Specification B30-40T (3A) and S.A.E. Specification No. 64. Nominal chemical composition of this alloy is copper 80.00, tin 10.00, lead 10.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. High Leaded Tin Bronze, Designation 3B. Gives chemical analysis and physical properties of the alloy. This standard is similar to A.S.T.M. Specification B30-40T (3B); and S.A.E. Specification No. 660. Nominal chemical composition of this alloy is copper 83.00, tin 7.00, lead 7.00, zinc 3.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. High Leaded Tin Bronze, Designation 3C. Gives chemical analysis and physical properties of the alloy. This standard is similar to A.S.T.M. Specification B30-40T (3C); and S.A.E. Specification No. 66. Nominal chemical composition of this alloy is copper 85.00, tin 5.00, lead 9.00, zinc 1.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. High Leaded Tin Bronze, Designation 3D. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specifications QQ-B-701 (No.7) and QQ-B-691a (No.7); A.S.T.M. Specification B30-40T (3D); and S.A.E. Specification No. 67. Nominal chemical composition of this alloy is copper 78.00, tin 7.00, lead 15.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. High Leaded Tin Bronze, Designation 3E. Gives chemical analysis and physical properties of the alloy. This standard is similar to A.S.T.M. Specification B30-40T (3E). Nominal chemical composition of this alloy is copper 70.00, tin 5.00, lead 25.00.

U. S. Gov., Federal Specification QQ-B-701a; 1944. Bronze; Ingots. Covers bronze ingots for remelting in 12 compositions. Gives requirements for material, workmanship, chemical composition for each composition, and physical requirements for each composition; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46B9d; 1941. Bronze; Journal, Castings.

References.—Methods of testing, general requirements for metals, see 600.1, 644.11, 646.0; aluminum bronze ingots, see 647.11; manganese bronze ingots, see 647.21; phosphor bronze ingots, see 647.31.

646.12 Bars, Bronze

Society of Automotive Engineers. Aeronautical Material Specification No. 4615; 1943. Silicon Bronze Rods and Bars; Hard. For rods, bars, or shapes. Chemical composition, condition, quality, tolerance, reports, and rejection. Similar to A.S.T.M. Specification B 98-42, Type D, Temper Hard.

References.—Aluminum bronze bars, see 647.12; manganese bronze bars, see 647.22; phosphor bronze bars, see 647.32.

646.2 BRONZE PLATES, SHEETS, SHAPES, AND STRIPS

646.21 Plates and Sheets, Bronze

Copper and Brass Research Assn. Flat Products Standards FP-1 to FP-7, inclusive, 1944. Covers rolled flat products, cold rolled, thickness tolerances; rolled flat products, length, width and straightness tolerances; rolled flat products, copper sheet and strip rolled to weight; rolled flat products, circles and half circles, diameter tolerances; rolled flat products, hot rolled plates and sheets, weight tolerances; silicon bronze (copper-silicon alloy) A.S.M.E. code tank plates and sheets, weight and thickness tolerances; and drawn strip, bar and flat wire, thickness and width tolerances; rolled flat products, condenser tube plates, tolerances, thickness, diameter, length or width, and flatness.

References.—Aluminum bronze plates and sheets, *see* 647.14; manganese bronze plates and sheets, *see* 647.24; phosphor bronze plates and sheets, *see* 647.33; standard gage and thicknesses for plates and sheets, *see* 644.21.

646.22 Shapes, Bronze

Copper and Brass Research Assn. Rod, Wire, Shapes Standards ROD-1 to ROD-3-A, inclusive, 1944. Covers rod and wire, diameter tolerances, extruded rod, bar and wire, diameter tolerances, hot rolled round rod and wire, diameter tolerances; drawn rod and bar, drawn strip and drawn flat wire, shapes length tolerances and schedule of short lengths; drawn rod and bar, drawn strip and drawn flat wire, shapes straightness tolerances.

References.—Aluminum bronze shapes, *see* 647.16; manganese bronze shapes, *see* 647.25; phosphor bronze shapes, *see* 647.35.

646.23 Strips, Bronze

Society of Automotive Engineers. Aeronautical Material Specification 4520B; 1944. Bronze Strip. Gives requirements for composition, condition, quality, reports, tolerance, and rejections. Similar Specification: SAE 791.

References.—Aluminum bronze strips, *see* 647.17; manganese bronze strips, *see* 647.24; phosphor bronze strips, *see* 647.36; standard gage and thicknesses for nonferrous alloys, *see* 644.21.

646.3 BRONZE RODS AND WIRES

646.31 Rods, Bronze

American Society for Testing Materials, B 98-44; 1944. A.S.M.E. Boiler Construction Code Specification SB-98. Copper-Silicon Alloy Rods, Bars, and Shapes. Gives basis of purchase, manufacture, chemical composition, chemical analysis, tensile and bending properties, test specimens, number of tests, dimensional tolerances, workmanship and finish, inspection, rejection, and table of commercially available copper-silicon alloy rods, bars, and shapes.

Copper and Brass Research Assn. Rod, Wire, Shapes Standards ROD-1 to ROD-3-A, inclusive, 1944. Covers rod and wire, diameter tolerances, extruded rod, bar and wire, diameter tolerances, hot rolled round rod and wire, diameter tolerances; drawn rod and bar, drawn strip and drawn flat wire, shapes length tolerances and schedule of short length; drawn rod and bar, drawn strip and drawn flat wire, shapes straightness tolerances.

Society of Automotive Engineers. Aeronautical Material Specification No. 4615; 1943. Silicon Bronze Rods and Bars; Hard. For rods, bars, or shapes. Chemical composition, condition, quality, tolerance, reports, and rejection. Similar to A.S.T.M. Specification B 98-42, Type D, Temper Hard.

References.—Tobin bronze (naval brass) rods, *see* 645.11; aluminum bronze rods, *see* 647.13; manganese bronze rods, *see* 647.23; phosphor bronze rods, *see* 647.38.

646.32 Wires, Bronze

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-52; 1935. Bronze Guy and Messenger Strand. Includes three sizes of 7-strand copper-base alloy; requirements as to breaking strength, bending, joints, stranding, pitch, and physical tests.

Copper and Brass Research Assn. Rod, Wire, Shapes Standards ROD-1 to ROD-3-A, inclusive, 1944. Covers rod and wire, diameter tolerances, extruded rod, bar and wire, diameter tolerances, hot rolled round rod and wire, diameter tolerances; drawn rod and bar, drawn strip and drawn flat wire, shapes length tolerances and schedule of short lengths; drawn rod and bar, drawn strip and drawn flat wire, shapes straightness tolerances.

International Municipal Signal Assn. Inc. Specification No. 31; 1942. Copper Alloy (Bronze) Messenger Strand. Covers copper alloy (bronze) strand for use as messengers in supporting aerial cable, fire alarm, police patrol and traffic signals or other municipal signalling equipment, and for the guying of overhead line poles. Gives requirements for material, properties, samples for test, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

References.—Bronze trolley wire, *see* 715.44; manganese bronze wire, *see* 647.27; phosphor bronze wire, *see* 647.38.

646.4 BRONZE CASTINGS AND TUBES

646.41 Castings, Bronze

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Bronze Castings. Include rules for inspection and tests.

American Society of Mechanical Engineers, joint sponsor with American Gear Manufacturers' Assn. American Standards Assn., B 6.2-1933. Gear Materials and Blanks. These specifications are for forged and rolled carbon steel, steel castings, bronze and brass castings, and forged and rolled alloy steel. Recommendations cover—manufacture, ladle, and check analyses, finish, marking, inspection, etc. Also included are tables on chemical composition for each type of material.

American Society for Testing Materials, B 22-44T; 1944. American Assn. of State Highway Officials, M 107. Tentative Specifications for Bronze Castings for Turntables and Movable Bridges and for Bearing and Expansion Plates or Fixed Bridges. Cover four classes of bronze castings for turntables and movable bridges and two classes of cast-bronze plates used in bridges and other structures for fixed and expansion bearings where motion is slow and intermittent. Give requirements for manufacture, chemical composition, chemical analysis, methods of chemical analysis, physical properties, hardness, test specimens, number of tests, finish, inspection, and rejection. Endorsed by American Foundrymen's Assn. A.S.T.M. Emergency Alternate Provision EA-B22b; 1944, affected table I, Chemical Requirements; table II, Physical Requirements; and Figures.

American Society for Testing Materials, B 61-44; 1944. A.S.M.E. Boiler Construction Code Specification SB-61. Steam or Valve Bronze Castings. Covers alloy composed of copper, tin, lead, zinc, commonly used as a high-grade steam metal or valve bronze. Gives basis of purchase, manufacture, chemical composition, chemical analysis, tensile properties, hydrostatic test, test specimens, number of tests, workmanship and finish, marking, inspection, certification, and rejection. Endorsed by the American Foundrymen's Assn., A.S.T.M. Emergency Alternate Provision EA-B61; 1943; affected section 7, Tests, and adds figures 3 and 4.

American Society for Testing Materials, B 66-44; 1944. Assn. of American Railways A.A.R. Specification M 503-42. Bronze Castings in the Rough for Locomotive Wearing Parts. Includes hard, medium, soft, and phosphor bronze castings, and ordinary uses of each. Gives requirements for chemical composition, chemical analysis, sample for chemical analysis, method of analysis, examination of fracture, number of tests, permissible variations in dimensions, workmanship and finish, marking, inspection, and rejection. Endorsed by the American Foundrymen's Assn.

American Society for Testing Materials, B 143-44T; 1944. Tentative Specifications for Tin-Bronze and Leaded Tin-Bronze Sand Castings. Cover castings of four alloys. Gives basis of purchase, manufacture, chemical composition and analysis, methods of chemical analysis, tensile properties, pressure and fracture tests, test specimens, number of tests, methods of testing, workmanship and finish, marking, inspection, certification, and rejection. A.S.T.M. Emergency Alternate Provision EA-B 143b; 1944, affected section 9, Test Specimens, and adds figures 3 and 4.

American Society for Testing Materials, B 144-44T; 1944. Tentative Specifications for High-Leaded Tin-Bronze Sand Castings. Cover five alloys and are intended for use for conventional bearings and bushings in the cast state. Gives basis of purchase, manufacture, chemical composition and analysis, methods of chemical analysis, tensile properties, pressure and fracture tests, test specimens, number of tests, methods of testing, workmanship and finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-B 144b; 1944, affected section 9, Test Specimens, and adds figures 3 and 4.

Hydraulic Institute. Material Specification for Bronze Castings, No. 130; 1939. Includes four grades of bronze castings used in the manufacture of pumping equipment; requirements for manufacture, chemical composition, test coupons, physical properties and tests, pattern equipment, workmanship, hydrostatic tests, and inspection.

Manufacturers Standardization Society of the Valve and Fittings Industry. Steam-Bronze Castings for Valves, Flanges, and Pipe Fittings, SP-20; 1943. Covers scope, quality and control, chemical composition, physical properties, tension test specimen, number of tests, records, workmanship and finish, and certification. Gives drawings showing dimensions.

Society of Automotive Engineers. Aeronautical Material Specification 4845A; 1944. Bronze Castings. Gives requirements for composition, hardness, quality, precautions, reports, identification, approval, and rejections. Similar Specifications: Federal QQ-B-691, composition 5; Navy 46M6; S.A.E. 62; A.S.T.M. B 143-41T, numerical designation 1A.

Society of Automotive Engineers. Aeronautical Material Specification No. 4855; 1943. Bronze Castings. Gives requirements for composition, quality, precautions, reports, identification, approval, and rejections. Similar Specifications: Federal QQ-B-691, composition 2; Air Corps 11306, grade A; Navy 46B23; A.S.T.M. B145-41T, designation 4A; S.A.E. 40.

Society of Automotive Engineers. Aeronautical Material Specification Nos. 7320 and 7322; 1940. Sealing Rings, Bronze Castings. Primarily for drilled oil seal rings but may be used for other purposes. Gives requirements for composition, hardness, quality, finish, reports, approval, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Brass and Bronze Castings, revised 1944. Gives specification No. 62—Hard Bronze Castings and No. 63—Leaded Gun Metal. Covers composition in percentage, general information, physical characteristics, and uses.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Bronze, Cast, Sample 52a. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R183-42; 1942. Bronze or Brass Valves. This recommendation covers the working steam pressure and sizes of steam rated gate, globe, angle, and check valves. Sponsored by the Valve Manufacturers Assn.

U. S. Gov., Federal Specification QQ-B-691b; 1944. Bronze; Castings. Covers one grade only for each composition. Gives requirements for material, workmanship, dimensions, chemical requirements, physical requirements, pressure, metallographic requirements, and tolerances; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46B8h; 1943. Bronze; Valve (Composition M), Castings.

U. S. Gov., Navy Dept. Specification 46B21c; 1939. Bronze for Screw Pipe Fittings (Composition S-c) Castings.

U. S. Gov., Navy Dept. Specification 46B23d; 1943. Bronze; Hydraulic (Ounce Metal), Castings (Oz-c).

U. S. Gov., Navy Dept. Specification 46B24d; 1942. Bronze; Castings, Ornamental.

U. S. Gov., Navy Dept. Specification 46M6h; 1944. Metal; Gun (Composition G), Castings.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for three grades of bronze castings—(A) for pressure containing parts of valves and pipe fittings subjected to working pressures up to 150 lb. p.s.i. or temperatures not exceeding 366° F.; (B) for pressure containing parts of valves and pipe fittings, also boiler mountings, expansion joints, and similar appliances subjected to steam pressures up to 300 lb., or temperatures not exceeding 450° F., and for hydraulic and compressed air services at higher pressures where the temperature does not exceed 150° F.; and (C) for bolts, nuts, and light-pressure vessels where comparatively great tensile strength and resistance to salt-water corrosion are required. Gives requirements for manufacture, chemical compositions, tensile properties, test specimens, number of tests, workmanship, finish, marking, and certification. In substantial agreement with American Society for Testing Materials Standard Specifications B62-41, B61-41, and B60-41.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Propellers, 1943. Bronze; Right-Hand Drive.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11, 646.0; bronze bearing metals, and metal bearings, *see* 692.2, 692.3; feed-in yokes of trolley wire, bronze, *see* 719.63; line carrying guns of bronze, *see* 619.1; water meters of cast bronze, *see* 793.4; builders' hardware of bronze, *see* 617; aluminum bronze castings, *see* 647.15; manganese bronze castings, *see* 647.26; phosphor bronze castings, *see* 647.34; other specifications for bronze castings, *see* specifications for individual commodities made of cast bronze.

646.42 Tubes, Bronze

Copper and Brass Research Assn. Tube, Pipe Standards TUBE-1 to TUBE-8, inclusive, 1944. Covers round seamless tubes, wall thickness and diameter tolerances; round seamless tubes, length tolerances, straightness tolerances; copper water tube, standard dimensions and weights, diameter and wall thickness tolerances, weight tolerances; pipe, dimensions and weights, weight and wall thickness tolerances; condenser and other heat exchanger tubes, dimensions and weight tolerances; and condenser and other heat exchanger tubes, estimating data.

Society of Automotive Engineers. Aeronautical Material Specification No. 4665; 1941. Copper Silicon Bronze; Seamless Tubing. Gives requirements for composition, condition (soft annealed), quality, tolerance, reports, identification, and rejections.

U. S. Gov., Navy Dept. Specification 45F10a; 1937. Fittings; Tube, Brass, or Bronze.

References.—Tobin bronze (naval brass) tubes, *see* 645.24; phosphor bronze tubing, *see* 647.37.

646.5 MANUFACTURES OF BRONZE

646.50 General Items

Manufacturers Standardization Society of the Valve and Fittings Industry. Spot Facing Standard for Bronze, Iron, and Steel Flanges, SP-9; 1942. To establish maximum and minimum dimensions that reflect the tools and equipment now in common use and to set up a table of dimensions for convenient reference. Applies primarily to the spot facing of pipe flanges in brass, iron, or steel when cast integral with valves and fittings, as well as the companion flanges used with this product. Gives diagram and table showing maximum and minimum spot face diameter for standard bolt sizes from 1/2 in. to 3 1/2 in.

646.51 Fittings, Bronze

International Assn. of Milk Sanitarians, jointly with International Assn. of Milk Dealers and Dairy Industries Supply Assn. Three Associations' Standards. The committees from the three associations have accepted standards for—(1) a recessless sanitary union for sanitary milk pipe lines, (2) threaded fittings including bends for use with this union, and (3) improved indicating and recording thermometer connections for tanks, vats, and for pipe lines. Gives drawings of the sanitary union and drawings with tables showing dimensions for various threaded fittings including bends and thermometer connections.

Manufacturers Standardization Society of the Valve and Fittings Industry. 150, 250, and 300 Pound SP Bronze Flange and Flanged Fitting Standard SP-2; 1943. Covers materials, bolting, marking, facings, dimensions, and gaskets, with dimensional diagrams of flanges and flanged fittings.

Manufacturers Standardization Society of the Valve and Fittings Industry. 125 Pound SP Bronze Screw Pipe Fittings Standard, SP-10; 1943. Covers title, pressure-temperature ratings, materials, size, marking, threading, ribs, fitting dimensions, patterns, and tolerances. Gives drawings of various types of fittings together with tables showing sizes and dimensions.

Manufacturers Standardization Society of the Valve and Fittings Industry. 125 Pound SP Bronze Gate Valves, SP-37; 1943. Covers three types in sizes from 1/4 in. to 3 in.—(I) wedge disc, non-rising stem gate valves; (II) double disc, rising stem, inside screw gate valves; and (III) wedge disc, rising stem, inside screw gate valves. Gives pressure-temperature ratings, marking, general design, detail design, materials, and inspection and tests.

Manufacturers Standardization Society of the Valve and Fittings Industry. 100 Pound SP Bronze Gate

Valves, SP-38; 1943. Covers the minimum requirements for 100 lb. bronze gate valves of the wedge disc non-rising stem type in sizes 1/4 in. to 2 in. Gives pressure temperature ratings, marking, general design, detail design, materials, and inspection and tests.

U. S. Gov., Dept. of Commerce National Bureau of Standards. Simplified Practice Recommendation R185-42; 1942. Pipe Fittings (Grey Cast Iron, Malleable Iron and Brass or Bronze). This recommendation covers the reduction of stock varieties to 35 percent of their former number. Sponsored by the Pipe Fittings Manufacturers Assn.

U. S. Gov., Federal Specification WW-F-406a; 1941. Amendment 1; 1943. Flange-Dimensions, Standard (Classes 125 and 250 Cast-Iron Flanges; Classes 150, 250, and 300 Bronze Flanges) (for Land Use). Covers standard dimensions for flanges and includes flanges integral with the pipe, pipe-fittings, and valves; companion flanges; and blind flanges. Gives requirements for class and description, sizes, (cast iron and bronze), marking, materials, threads, brazing hubs, silver brazing alloy, and details for each class including facing and dimensions; method of inspection; and packing of shipments.

U. S. Gov., Federal Specification WW-P-448a; 1941. Pipe-Fittings; Brass or Bronze (Threaded or Brazed), 125-Pound. • Covers bushings, caps, couplings, crosses, elbows, plugs, return bends, tees, and Y-branch, 45°, straight. Gives requirements for chemical composition and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-448a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) permitted additional compositions for material, changed requirements for type II, Packaging and Sizes.

U. S. Gov., Federal Specification WW-P-461a; 1942. Pipe-Fittings; Brass or Bronze (Threaded), 250-Pound. Covers couplings, crosses, elbows, and tees. Gives requirements for chemical composition and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-461a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) permitted additional compositions for material and changed requirements for packing and marking.

U. S. Gov., Federal Specification WW-U-516; 1931. Unions; Brass or Bronze, 250-Pound. Covers threaded type in three chemical compositions—A, B, and C. Gives requirements for chemical compositions, physical properties, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-U-516; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for chemical composition, finish, and packaging.

U. S. Gov., Navy Dept. Specification 45F1f; 1941. Fittings; Pipe, Bronze (Threaded), 250-Pound.

U. S. Gov., Navy Dept. Specification 45f2e; 1932. Fittings; Pipe, Brass or Bronze, Threaded, 125-Pound.

U. S. Gov., Navy Dept. Specification 45F8b; 1935. Fittings; Gage-Glass (Tubular).

U. S. Gov., Navy Dept. Specification 45F12; 1944. Fittings; Tube, Bronze, Cast (Silver-Brazing).

U. S. Gov., Navy Dept. Specification 45U5a; 1935. Unions; Brass or Bronze, 250-Pound.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11, 646.0; hose valves, gate valves, check valves for fire protection, *see* 607.6; other bronze pipe fittings, *see* 645.4.

646.52 Bronze-Wire Manufactures

American Hospital Assn., 4-10. Wire Screen Cloth. Covers copper, commercial bronze (brass), bronze, iron or steel, galvanized (zinc coated), copper-nickel alloy, corrosion-resisting steel (chromium-nickel), aluminum alloy, iron or steel, japanned or painted, and chromium-nickel alloy. Based on U. S. Gov. Federal Specifications RR-C-541a for Wire Screen Cloth and QQ-M-151a for General Specification for Inspection of Metals.

American Society for Testing Materials, E 11-39; 1939. American Assn. of State Highway Officials, M 92-42. American Standards Assn., Z23.1-1939. Sieves for Testing Purposes (Wire Cloth Sieves, Round-Hole and Square-Hole Screens or Sieves). For precision testing in classification of materials according to size, and method of calibrating wire cloth sieves. Construction of woven wire sieves of brass, bronze, or other suitable wire, standard 8- and 3-in. sieves, micron designations for fine series and nominal dimensions, permissible variations, and limits for fine and coarse series standard wire cloth sieves, label marking, plates, and frames for round-hole and square-hole sieves, and spacing of openings.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S. A. E. Standard Wire Cloth, adopted 1924. Table of sizes and dimensions with tolerances and types of weave.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R122-31; 1931. Wire Insect Screen Cloth. This recommendation establishes a number of stock varieties of black painted and electro-galvanized steel wire screen cloth and of copper and commercial bronze wire screen cloth; includes standard mesh openings, sizes of wire, widths of roll, length of roll, packing, required percentage of copper for copper and bronze screen wire.

References.—Methods of testing sieves, *see* 654.31; copper and brass wire cloth, *see* 642.4, 645.39; fourdrinier wire cloth of bronze or phosphor bronze, *see* 645.39.

646.59 Miscellaneous Manufactures of Bronze

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field, 1940-41. Prize Medals. Requirements for size, quality, and weight of gold, silver, and bronze medals for junior, senior, and team.

U. S. Gov., Federal Specification RR-C-271; 1931. Amendment 2; 1934. Chain and Attachments; Standard, Miscellaneous. Covers two types—(A) welded; two grades—(I) crane, wrought iron; and (II) proof coil, wrought iron, or open-hearth steel; and (B) weldless (steel, copper, brass, or bronze); six classes for type A—(1) close link; (2a) long link, buoy or submarine net; (2b) long link, conveyor or sprocket wheel; (3a) twist link, plain pattern; (3b) twist link, long-link pattern; and (3c) twist link, short-link pattern; twelve classes for type B—(1) single-loop pattern, (2) double-loop pattern, (3) sash, (4a) flat link (long pitch), (4b) flat link (short pitch), (5) plumber's, (6) safety, (7) single jack, (8) double jack, (9) ladder, (10) register, and (11) brass, for mechanical communications. Gives requirements for material, workmanship, weights, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specifications for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Bronze Bearing Plates.

U. S. Gov., Navy Dept. Specification 42S2b; 1938. Sockets; Table.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-2152; 1940. Case; Firing Device, Submarine Mine.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11, 646.0; bronze padlocks, *see* 617.21; fire hose fittings of bronze, *see* 974.2; builders hardware of bronze, *see* 617; aluminum bronze products, *see* 647.1; manganese bronze products, *see* 647.2; phosphor bronze products, *see* 647.3; testing screens, bronze, *see* 619.2.

647. SPECIAL BRONZES (BRONZE ALLOYS)

647.0 GENERAL ITEMS

Copper and Brass Research Assn. Alloy Standards, 1944. Covers standard commercial wrought copper and copper-base alloys. Gives name, composition, and forms generally available including flat rolled products, rod and drawn bar, shapes, wire, and tube.

647.1 ALUMINUM BRONZE

647.11 Ingots, Aluminum Bronze

American Society for Testing Materials, B30-44T; 1944. Tentative Specifications for Copper-Base Alloys in Ingot Form for Sand Castings. Covers 25 copper-base alloys, with A.S.T.M. classifications, numerical, and commercial designations, and nominal compositions. Manufacture, chemical composition, samples for analysis, chemical analysis, marking, inspection, rejection and retesting, claims, and settlement of claims. Endorsed by American Foundrymen's Assn.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Aluminum Bronze, Designation 9A. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specification QQ-B-671 Grade A; A.S.T.M. Specification B30-40T (9A); S.A.E. Specification No. 68, Grade A. Nominal chemical composition of this alloy is copper 87.50, iron 3.50, aluminum 9.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Aluminum Bronze, Designation 9B. Gives chemical analysis and physical properties of the alloy. This standard is similar to Federal Specification QQ-B-671 Grade B; A.S.T.M. Specification B30-40T (9B); and S.A.E. Specification No. 68, Grade B. Nominal chemical composition of this alloy is copper 89.00, iron 1.00, aluminum 10.00.

U. S. Gov., Navy Dept. Specification 46B19a; 1925. Bronze; Aluminum (Composition Al-1) Ingots.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11, 646.0.

647.12 Bars, Aluminum Bronze

American Society for Testing Materials, B150-44T; 1944. Tentative Specifications for Aluminum Bronze Rods, Bars, and Shapes. Cover rods, bars, and shapes of any cross-section, uniform with respect to length. Basis of purchase, manufacture, chemical composition, and analysis, tensile and bending properties, mercurous nitrate test, test specimens, number of tests, methods of testing, tolerances, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4630A; 1940. Aluminum Bronze Rods or Bars. Gives requirements for form (rods, bars, forgings, or as ordered), composition, condition, quality, tolerance, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 4631; 1943. Aluminum Bronze; Silicon. For bars, rods, forgings, or as ordered. Gives requirements for tensile strength, yield strength, elongation, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 4632; 1941. Aluminum Bronze; Rods and Bars. Gives requirements for composition, condition, quality, tolerance, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 4635; 1941. Aluminum Bronze; Bars and Forgings. Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification No. 4640; 1940. Aluminum Bronze (Wrought), Nickel-Iron-Manganese. Gives requirements for form (rod, bars, forgings, or as ordered), composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 701—Wrought Aluminum Bronze Rods, Bars, and Shapes. Covers composition in percentage, general information, physical properties, tensile test, bend test, mercurous nitrate test, and tolerances.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-16-1; 1944. Bronze; Aluminum, Bar and Rod.

U. S. Gov., Federal Specification QQ-B-666; 1934. Amendment 3; 1942. Bronze; Aluminum, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes bars—type II, grade B. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46B17b; 1937. Bronze; Aluminum Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11, 646.0.

647.13 Rods, Aluminum Bronze

American Society for Testing Materials, B150-44T; 1944. Tentative Specifications for Aluminum Bronze Rods, Bars, and Shapes. Cover rods, bars, and shapes of any cross-section, uniform with respect to length. Basis of purchase, manufacture, chemical composition, and analysis, tensile and bending properties, mercurous nitrate test, test specimens, number of tests, methods of testing, tolerances, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4630A; 1940. Aluminum Bronze Rods or Bars. Gives requirements for form (rods, bars, forgings, or as ordered), composition, condition, quality, tolerance, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.4631; 1943. Aluminum Bronze; Silicon. For bars, rods, forgings, or as ordered. Gives requirements for tensile strength, yield strength, elongation, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.4632; 1941. Aluminum Bronze; Rods and Bars. Gives requirements for composition, condition, quality, tolerance, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.4640; 1940. Aluminum Bronze (Wrought), Nickel-Iron-Manganese. Gives requirements for form (rod, bars, forgings, or as ordered , composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, Revised 1944. Gives specification No.701—Wrought Aluminum Bronze, Rods, Bars, and Shapes. Covers composition in percentage, general information, physical properties, tensile test, bend test, mercurous nitrate test, and tolerances.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-16-1; 1944. Bronze; Aluminum, Bar and Rod.

U. S. Gov., Federal Specification QQ-B-666; 1934. Amendment 3; 1942. Bronze; Aluminum, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes rods—type I, grade B. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Federal Specification QQ-N-286; 1940. Nickel-Copper-Aluminum Alloy; Forgings, Rods, Strips, and Wire. Covers one grade. Includes four classes of rods—(A) hot-rolled or forged, (B) hot-rolled or forged, heat-treated, (C) cold-drawn, and (D) cold-drawn, heat-treated. Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46B17b; 1937. Bronze; Aluminum Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—*See* references under 647.12.

647.14 Plates and Sheets, Aluminum Bronze

American Society for Testing Materials, B169-44T; 1944. Tentative Specifications for Aluminum Bronze Sheet and Strip. Covers two alloys of commercial aluminum bronze sheet and strip, commonly used for drawing, forming, stamping, and bending. Gives scope, basis of purchase, manufacture, chemical composition, analysis, tensile and bending properties, tests, tolerances, finish, and inspection.

U. S. Gov., Federal Specification QQ-B-666; 1934. Amendment 3; 1942. Bronze; Aluminum, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes plates—type IV, grade A; and sheets—type V, grade A. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46B17b; 1937. Bronze; Aluminum Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Thickness tolerances, *see* 640.1; standard gage and thicknesses for nonferrous sheets and plates, *see* 644.21; *see* references under 647.12

647.15 Castings, Aluminum Bronze

American Society for Testing Materials, B 148-44 T; 1944. Tentative Specifications for Aluminum-Bronze Sand Castings. Cover castings of two alloys. Basis of purchase, manufacture, chemical composition and analysis, methods of chemical analysis, tensile properties, test specimens, number of tests, methods of testing, workmanship and finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-B 148a; 1942, affected section 3, Manufacture; table III, Tensile Requirements.

Society of Automotive Engineers. Aeronautical Material Specification No.4870; 1944. Aluminum Bronze Castings, as Cast. Gives requirements for type, composition, condition, physical properties, quality, precautions, reports, identification, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.4871; 1942. Aluminum Bronze Castings (Heat Treated). Covers requirements for composition, condition, physical properties, quality, precautions, reports, identification, approval, and rejections. Similar to U. S. Gov., War Dept., Specification 11076.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Brass and Bronze Castings, revised 1944. Gives specification No.68—Aluminum Bronze. Covers composition in percentages, general information, physical properties, and uses.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-B-672-1; 1944. Bronze; Aluminum, Castings, Aircraft.

U. S. Gov., Federal Specification QQ-B-671a; 1941. Amendment 2; 1944. Bronze; Aluminum, Castings. Covers four classes—(A) as cast, (B) heat treated, (C) as cast, and (D) heat treated. Gives requirements for material, workmanship, quality, repairing of defects, chemical composition, and physical properties; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 46B18c; 1934. Bronze; Aluminum (Composition A1-c) Castings.

U. S. Gov., Navy Dept. Specification 46B29; 1939. Bronze; Aluminum-Manganese Castings (Composition MA-c).

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11, 646.0.

647.16 Shapes, Aluminum Bronze

American Society for Testing Materials, B150-44T; 1944. Tentative Specifications for Aluminum Bronze Rods, Bars, and Shapes. Cover rods, bars, and shapes of any cross-section, uniform with respect to length. Basis of purchase, manufacture, chemical composition, and analysis, tensile and bending properties, mercurous nitrate test, test specimens, number of tests, methods of testing, tolerances, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification No. 4631; 1943. Aluminum Bronze; Silicon. For bars, rods, forgings, or as ordered. Gives requirements for tensile strength, yield strength, elongation, quality, tolerances, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No. 4635; 1941. Aluminum Bronze; Bars and Forgings. Gives requirements for composition, condition, quality, tolerance, reports, identification, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification No. 4640; 1940. Aluminum Bronze (Wrought), Nickel-Iron-Manganese. Gives requirements for form (rod, bars, forgings, or as ordered), composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives Specification No.701—Wrought Aluminum Bronze; Rods, Bars, and Shapes. Covers composition in percentages, general information, physical properties, tensile test, bend test, mercurous nitrate test, and tolerances.

U. S. Gov., Federal Specification QQ-B-666; 1934. Amendment 3; 1942. Bronze; Aluminum, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes shapes—type III, grade B. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46B17b; 1937. Bronze; Aluminum Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—*See* references under 647.15.

647.17 Strips, Aluminum Bronze

American Society for Testing Materials, B169-44T; 1944. Tentative Specifications for Aluminum Bronze Sheet and Strip. Covers two alloys of commercial aluminum bronze sheet and strip, commonly used for drawing, forming, stamping, and bending. Gives scope, basis of purchase, manufacture, chemical composition, analysis, tensile and bending properties, tests, tolerances, finish, and inspection.

U. S. Gov., Federal Specification QQ-B-666; 1934. Amendment 3; 1942. Bronze; Aluminum, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes strips—type VI, grade A. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Federal Specification QQ-N-286; 1940. Nickel-Copper-Aluminum Alloy; Forgings, Rods, Strips, and Wire. Covers one grade. Includes six classes of cold-rolled strips—(A) soft, (B) soft, heat-treated, (C) half-hard, (D) half-hard, heat-treated, (E) full-hard, and (F) full-hard, heat-treated. Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46B17b; 1937. Bronze; Aluminum Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Thickness tolerances, *see* 640.1; standard gage and thicknesses for nonferrous strip, *see* 644.21; *see* references under 647.15.

647.18 Tubes and Wire, Aluminum Bronze

American Society for Testing Materials, B 111-43; 1943. A.S.M.E. Boiler Construction Code Specification SB-111. Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock. For use in surface condensers, evaporators, and heat exchangers. Gives requirements for material, manufacture, chemical composition, sample for chemical analysis, microscopic examination, expanding test, mercurous nitrate test, hydrostatic test, dimension and weight tolerances, workmanship, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-B-111; 1942, affected section 3, Material.

U. S. Gov., Federal Specification QQ-N-286; 1940. Nickel-Copper-Aluminum Alloy; Forgings, Rods, Strips, and Wire. Covers one grade. Includes four classes of wire—(A) cold-drawn (B) cold-drawn, heat-treated, (C) cold-drawn, soft, and (D) cold-drawn, soft, heat-treated. Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

647.2 MANGANESE BRONZE

647.20 General Items

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Bronze, Manganese, Sample 62b. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

647.21 Ingots, Manganese Bronze

U. S. Gov., Federal Specification QQ-B-731a; 1938. Bronze; Manganese, Ingots (for Remelting). Covers one grade. Gives requirements for chemical composition, and tensile properties; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

References.—Methods of chemical analysis, general requirements for metals, *see* 647.20, 600.1.

647.22 Bars, Manganese Bronze

American Society for Testing Materials, B-138-43; 1943. Manganese Bronze Rods, Bars, and Shapes. Covers two types of any cross-section uniform with respect to length. Gives basis of purchase, manufacture, chemical composition, chemical analysis, tensile and bending properties, mercurous nitrate test, test specimens, number of tests, methods of testing, tolerances, workmanship and finish, inspection, and rejection.

U. S. Gov., Federal Specification QQ-B-721a; 1937. Amendment 1; 1942. Bronze; Manganese, Bars, Forgings, Plates, Rods, and Shapes. Includes two classes for soft, half-hard, and hard bars—A and B. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking. Emergency Alternate Federal Specification E-QQ-B-721A; 1941, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specifications (QQ-S-636) Steel, Carbon (Low Carbon), Sheets and Strips; and (QQ-S-671) Steel, Carbon and Alloy, Bars, Steels FS1010, FS1015, FSX1015, FSX1020, FS1025, FSX1025, FS1030, FS1035, FS1040, FS1045.

References.—Methods of testing, general requirements for metals, *see* 600.1, 647.20.

647.23 Rods, Manganese Bronze

American Society for Testing Materials, B-138-43; 1943. Manganese Bronze Rods, Bars, and Shapes. Covers two types of any cross-section uniform with respect to length. Gives basis of purchase, manufacture, chemical composition, chemical analysis, tensile and bending properties, mercurous nitrate test, test specimens, number of tests, methods of testing, tolerances, workmanship and finish, inspection, and rejection.

U. S. Gov., Federal Specification QQ-B-721a, 1937. Amendment 1; 1942. Bronze; Manganese, Bars, Forgings, Plates, Rods, and Shapes. Includes two classes for soft, half-hard, and hard rods. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking. Emergency Alternate Federal Specification E-QQ-B-721a; 1941, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specifications (QQ-S-636) Steel, Carbon (Low-Carbon), Sheets and Strips; and (QQ-S-671) Steel, Carbon and Alloy, Bars, Steels FS1010, FS1015, FSX1015, FSX1020, FS1025, FSX1025, FS1030, FS1035, FS1040, FS1045.

U. S. Gov., Federal Specification QQ-R-571; 1932. Rods; Welding, Nonferrous (for) Gas Welding. Includes type A—manganese bronze. Gives requirements for chemical composition, weldability, character of weld metal, physical properties, sizes, and lengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 46B15d; 1939. Composition Mn-r (Bronze, Manganese); Plates, Rods, and Shapes.

U. S. Gov., Navy Dept. Specification 46R1b; 1933. Rods; Welding, Nonferrous (for Gas Welding).

References.—Welding equipment and practice, *see* 767; *see* references under 647.22.

647.24 Plates and Sheets, Manganese Bronze

U. S. Gov., Federal Specification QQ-B-721a; 1937. Amendment 1; 1942. Bronze; Manganese, Bars, Forgings, Plates, Rods, and Shapes. Includes one class for soft and half-hard plates—A. Gives requirements for material; workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking. Emergency Alternate Federal Specification E-QQ-B-721A; 1941, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specifications (QQ-S-636) Steel, Carbon (Low Carbon), Sheets and Strips; and (QQ-S-671) Steel, Carbon and Alloy, Bars, Steels FS1010, FS1015, FSX1015, FSX1020, FS1025, FSX1025, FS1030, FS1035, FS1040, FS1045.

U. S. Gov., Navy Dept. Specification 46B15d; 1939. Composition Mn-r (Bronze, Manganese); Plates, Rods, and Shapes.

References.—Standard gage and thicknesses for plates and sheets, *see* 644.21; *see* references under 647.22.

647.25 Shapes, Manganese Bronze

American Society for Testing Materials, B-138-43; 1943. Manganese Bronze Rods, Bars, and Shapes. Covers two types of any cross-section uniform with respect to length. Gives basis of purchase, manufacture, chemical composition, chemical analysis, tensile and bending properties, mercurous nitrate test, test specimens, number of tests, methods of testing, tolerances, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 2560A; 1942. Impregnation of Castings. To make porous castings pressure tight by suitable cleaning of castings, extraction of air from the porous sections by vacuum, pressure filling the evacuated pores with tung oil, and subsequent polymerization and swelling of the oil retained by the pores. Optional processes permitted. Includes preparation of castings, requirements for materials, impregnation procedure, and identification.

U. S. Gov., Federal Specification QQ-B-721a; 1937. Amendment 1; 1942. Bronze; Manganese, Bars, Forgings, Plates, Rods, and Shapes. Includes one class for soft shapes—A. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking. Emergency Alternate Federal

Specification E-QQ-B-721A; 1941 (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specifications (QQ-S-636) Steel, Carbon (Low Carbon), Sheets and Strips; and (QQ-S-671) Steel, Carbon and Alloy, Bars, Steels FS1010, FS1015, FS1015, FSX1020, FS1025, FSX1025, FS1030, FS1035, FS1040, FS1045.

U. S. Gov., Navy Dept. Specification 46B15d; 1939. Bronze; Manganese (Composition Mn-r) Plates, Rods, and Shapes.

References.—See references under 647.22.

647.26 Castings, Manganese Bronze

American Society for Testing Materials, B132-44T; 1944. Tentative Specifications for Leaded High-Strength Yellow Brass (Manganese Bronze) Sand Castings. For light or medium and heavy section castings, two classes, known commercially as manganese bronze, for use as structural or nonpressure containing parts of valves. Basis of purchase, manufacture, tensile properties, test specimens, methods of testing, chemical composition, marking, inspection, castings made from stock, and certification.

Society of Automotive Engineers. Aeronautical Material Specification 4619; 1940. Manganese Bronze; Forgings. Covers requirements for composition, condition, quality, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4860; 1940. Manganese Bronze; Castings. Gives requirements for composition, test bars, quality, reports, precautions, identification, shipments, approval, and rejections. Similar to U. S. Gov., Navy Dept., Specification 49B3; U. S. Gov. Federal Specification QQ-B-726; A.S.T.M. Specification B54-27; and Society of Automotive Engineers Specification 43.

Society of Automotive Engineers. Aeronautical Material Specification 4862A; 1944. Manganese Bronze Castings (High Strength). Gives requirements for composition, condition, physical properties, quality, precautions, reports, identification, approval, and rejections. Similar Specifications: Federal QQ-B-726, Class C; Navy 46B29, Class A.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Brass and Bronze Castings, revised 1944. Gives specification No.43—Manganese Bronze and High Tensile Manganese Bronze. Covers composition in percentage, general information, physical characteristics, and intended uses.

U. S. Gov., Federal Specification QQ-B-721a; 1937. Amendment 1; 1942. Bronze; Manganese, Bars, Forgings, Plates, Rods, and Shapes. Includes one class for soft, half-hard, and hard forgings. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking. Emergency Alternate Federal Specification E-QQ-B-721A; 1941, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specifications QQ-S-636, Steel, Carbon (Low Carbon), Sheets and Strips; and QQ-S-671, Steel, Carbon and Alloy, Bars, Steels FS1010, FS1015, FSX1015, FSX1020, FS1025, FSX1025, FS1030, FS1035, FS1040, FS1045.

U. S. Gov., Federal Specification QQ-B-726c; 1943. Amendment 1; 1944. Bronze; Manganese, Castings (including Manganese Aluminum Bronze). Covers four classes—A, B, C, and D. Gives requirements for material, appearance of castings, repairing of defects, dimensions, chemical composition, and tensile requirements; methods of sampling, inspection, and tests; packing and marking.

U. S. Gov., Navy Dept. Specification 49B3e; 1939. Bronze; Manganese Castings (Composition Mn-c).

References.—See references under 647.22; manganese bronze ingots, *see* 647.21.

647.27 Wires, Manganese Bronze

647.3 PHOSPHOR BRONZE

647.31 Ingots and Bearing Metals, Phosphor Bronze

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Movable Railway Bridges. Covers requirements for phosphor bronze—hardness, casting ingots, grades, chemical and physical properties, test specimens, and compression tests.

References.—Bronze bearing metals and metal bearings, *see* 647.34, 692.2, 692.3; methods of testing, general requirements for metals, *see* 600.1.

647.32 Bars, Phosphor Bronze

American Society for Testing Materials, B139-44T; 1944. Tentative Specifications for Phosphor Bronze Rods, Bars, and Shapes. Cover five grades of rods, bars, and shapes 0.250 in., and over in diameter or thickness, and of any cross-section uniform with respect to length. Basis of purchase, manufacture, chemical composition, sampling for and methods of chemical analysis, tensile and bending properties, test specimens, number and methods of tests, tolerances, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4625B; 1942. Phosphor Bronze; Rods and Bars (Hard). Gives requirements for form (rods, bars, tubes, or shapes), composition, condition, quality, tolerance, reports, identification, and rejections. Similar specifications: Federal QQ-B-746, Types I, II, and III, Grade A, Temper Hard; Navy 46B14; A.S.T.M. B139-42T, Grade A.

U. S. Gov., Federal Specification QQ-B-746; 1934. Amendment 2; 1942. Bronze; Phosphor, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes (type II) bars, grade A, hard. Gives requirements for material. workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46B14f; 1945. Bronze; Phosphor, Rolled or Drawn, Bars, Plates, Rods, Sheets, and Strips.

647.33 Plates and Sheets, Phosphor Bronze

American Society for Testing Materials, B 103-44; 1944. Phosphor Bronze Sheet and Strip. For drawing, forming, stamping, and bending, particularly in making of spring devices for electrical apparatus. Covers four grades. Gives requirements for manufacture, chemical composition, sampling, analysis, tempers, tensile strength, hardness, testing, tolerances, workmanship and finish, inspection, and rejection.

U. S. Gov., Federal Specification QQ-B-746; 1934. Amendment 2; 1942. Bronze; Phosphor, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes (type IV) plates, grades A and B; and (type V) sheets, grades A and B. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46B14f; 1945. Bronze; Phosphor, Rolled or Drawn, Bars, Plates, Rods, Sheets; and Strips.

References.—Standard gage and thicknesses for nonferrous sheets and plates, *see* 644.21.

647.34 Castings, Phosphor Bronze

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Brass and Bronze Castings, revised 1944. Gives specification No. 64—Phosphor Bronze, No. 640—Nickel Phosphor Bronze, and No. 65—Phosphor Gear Bronze. Covers composition in percentage, general information, physical characteristics, and uses.

U. S. Gov., Navy Dept. Specification 46B51; 1943. Bronze; Phosphor Castings (Composition P-c).

References.—Phosphor bronze bearing metal castings, *see* 647.31; methods of testing, general requirements for metals, *see* 600.1.

647.35 Shapes, Phosphor Bronze

American Society for Testing Materials, B139-44T; 1944. Tentative Specifications for Phosphor Bronze Rods, Bars, and Shapes. Cover five grades of rods, bars, and shapes 0.250 in. and over in diameter or thickness, and of any cross-section uniform with respect to length. Basis of purchase, manufacture, chemical composition, sampling for and methods of chemical analysis, tensile and bending properties, test specimens, number and methods of tests, tolerances, workmanship and finish, inspection, and rejection.

U. S. Gov., Federal Specification QQ-B-746; 1934. Amendment 2; 1942. Bronze; Phosphor, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes (type III) shapes, grade A, hard. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

647.36 Strips, Phosphor Bronze

American Society for Testing Materials, B 103-44; 1944. Phosphor Bronze Sheet and Strip. For drawing, forming, stamping, and bending, particularly in making of spring devices for electrical apparatus. Covers four grades. Gives requirements for manufacture, chemical composition, sampling, analysis, tempers, tensile strength, hardness, testing, tolerances, workmanship and finish, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4510A; 1942. Phosphor Bronze Strip. Covers requirements for composition, condition (spring temper), quality, tolerances, reports, and rejections. Similar specifications: Federal QQ-B-746, Type VI, Grade A, Temper Spring; Navy 46B14, Temper Spring; A.S.T.M. B103-42T, Temper Spring; and S.A.E. 77, Grade A.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials, S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 77—Phosphor Bronze Strip. Covers composition in percentage, general information, temper and tensile strength, and dimensional tolerances.

U. S. Gov., Federal Specification QQ-B-746; 1934. Amendment 2; 1942. Bronze; Phosphor, Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes (type VI) strips, grades A and B. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection, and test; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46B14f; 1945. Bronze; Phosphor, Rolled or Drawn, Bars, Plates, Rods, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1; thickness tolerances, see 640.1; standard gage and thicknesses for strip, see 644.21.

647.37 Tubing, Phosphor Bronze

647.38 Wires and Rods, Phosphor Bronze

American Society for Testing Materials, B139-44T; 1944. Tentative Specifications for Phosphor Bronze Rods, Bars, and Shapes. Cover five grades of rods, bars, and shapes 0.250 in. and over in diameter or thickness, and of any cross-section uniform with respect to length. Basis of purchase, manufacture, chemical composition, sampling for and methods of chemical analysis, tensile and bending properties, test specimens, number and methods of test, tolerances, workmanship and finish, inspection, and rejection.

American Society for Testing Materials, B159-44T; 1944. Tentative Specifications for Phosphor Bronze Wire. Covers three grades of round phosphor bronze wire for general use and for spring purposes. Gives requirements for basis of purchase, manufacture, chemical composition, sampling for chemical analysis, methods of chemical analysis, tensile properties, bending properties, number of tests, diameter tolerances, workmanship and finish, packing, inspection, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4625B; 1942. Phosphor Bronze; Rods and Bars (Hard). Gives requirements for form (rods, bars, tubes, or shapes), composition, condition, quality, tolerance, reports, identification, and rejections. Similar specifications: Federal QQ-B-746, Types I, II, and III, Grade A, Temper Hard; Navy 46B14; A.S.T.M. B139-42T, Grade A.

Society of Automotive Engineers. Aeronautical Material Specification 4720A; 1942. Spring Wire; Phosphor Bronze (5 Percent Tin-Solution). Gives requirements for composition, condition, quality, tolerances, reports, and rejections. Similar specifications: Federal QQ-W-401; Navy 22W5; S.A.E. 81; A.S.T.M. B159-42T, Grade A.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Wrought Copper Alloys, revised 1944. Gives specification No. 81—Phosphor Bronze Wire. Covers composition in percentage, physical properties, mechanical requirements, bend test, appearance, and dimensional tolerances.

U. S. Gov., Federal Specification QQ-B-746; 1934. Amendment 2; 1942. Bronze; Phosphor Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes (type I) rods, grade A, hard. Gives requirements for material, workmanship, chemical composition, physical properties, and permissible variations; methods of sampling, inspection and tests; and requirements for packing and marking.

U. S. Gov., Federal Specification QQ-W-401, 1932. Amendment 4; 1943. Wire; Phosphor-Bronze, Spring. Covers one grade, either hard-drawn or hard-rolled. Gives chemical composition and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification RR-R-571; 1933. Amendment 6; 1944. Rope; Wire. Covers about 25 types. Gives definitions and general requirements for wire, strand, centers, cores, lubrication, marline, diameter of wire rope, and performing; details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 22W5f; 1939. Wire; Spring, Phosphor-Bronze.

U. S. Gov., Navy Dept. Specification 46B14f; 1945. Bronze; Phosphor, Rolled or Drawn, Bars, Plates, Rods, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1; iron and steel wire and wire rope, *see* 603.41, 603.42; wire gages, *see* 603.40; wire cloth of phosphor bronze, *see* 646.52.

650-659 LEAD, MERCURY, AND NICKEL

651. LEAD

651.0 GENERAL ITEMS

American Society for Metals. Metal Handbook, 1939 edition. Constitution of Lead Alloys, Properties of Lead and Its Alloys, and Micrography of Lead. Covers constitution of lead-antimony, lead-bismuth, lead-codmium, lead-calcium, lead-magnesium, lead-silver, and lead-tin alloys; physical constants of lead; properties of lead-antimony, lead-calcium, lead-tin, and lead-tin-antimony alloys; lead-base bearing alloys; preparation of lead for metallographic examinations; and etching lead for metallographic examination.

American Standards Assn., Z 37.11-1943. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Lead and Certain of Its Inorganic Compounds. To prescribe the permissible concentration of metallic lead, lead carbonate, lead sulfate, lead oxides, lead nitrate, and lead chloride in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Gives toxic properties of lead, permissible concentration, sampling procedure, and analytical methods.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 2, Part 6; 1938. Determination of Lead in the Air. Covers collection of dust sample from the air, analysis of sample, typical example, and microscopic detection of lead.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Lead. Covers definition, constants, solubility, occurrence, grades and specifications, marketing methods, forms available, impurities, uses, and substitutes.

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. United States and British Commonwealth of Nations Aircraft Metals. Lead Alloys. Gives table showing specifications used in the United States and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers lead alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement. 1944. Standard Samples. Lead, Sample 49b. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

651.1 LEAD INGOTS

U. S. Gov., Federal Specification QQ-L-171; 1931. Lead; Pig. Covers two grades—A and B. Gives requirements for material, weight, marking, and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 42W2; 1943. Weights; Ballast.

References.—Methods of chemical analysis, general requirements for metals, *see* 651.0, 600.1.

651.2 BAR LEAD

651.3 CASTINGS, LEAD

American Society for Testing Materials, B 102-44; 1944. Lead- and Tin-Base Alloy Die Castings. For pressure die castings from five designated alloys. Gives requirements for chemical compositions, sampling, density, soundness, finish, permissible variations in dimensions, and rejection.

Lead Industries Assn. Hard Lead Closet Floor Flange, 1943. Gives requirements for material, dimensions, weight, workmanship, and drawing.

U. S. Gov., Federal Specification FF-H-111; 1933. Hardware; Builders', Shelf and Miscellaneous. Includes weights, sash. Covers four types of weight made of cast iron or cast lead, round or square. Emergency Alternate Federal Specification E-FF-H-111, July 1943, changed requirements in order to conserve lead.

U. S. Gov., Navy Dept. Specification 12S12b; 1933. Sinkers; Boat-Chest.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 29-27B; 1940. Lead; Sounding, 8-Pound.

U. S. Gov., U. S. Maritime Commission. Specification 23-MC-1; 1941. Leads; Sounding (for) Hand Line. Shall be but one type and grade. Gives requirements for material, workmanship, construction, inspection, tests, and drawing.

651.4 STRIPS AND SLEEVES, LEAD

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-51; 1932. Lead and Lead-Alloy Sleeving. For covering splices in lead-sheathed cable, includes lead, lead-tin, and lead-antimony sleeving, requirements as to composition, form, dimensions, and finish.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-439A; 1937. Sleeve; Types FT-75 to FT-85, Inclusive, Lead.

651.5 SHEET LEAD

American Society of Mechanical Engineers. American Standards Assn., B32.1-1941. Preferred Thicknesses for Uncoated, Thin Flat Metals (Under 0.250 Inch). Provides a simplified system for designating the thickness of uncoated, thin flat metals and alloys by decimal parts of an inch. Gives table of preferred thicknesses.

U. S. Gov., Federal Specification QQ-L-201; 1933. Amendment 1; 1942. Lead; Sheet. Covers two grades—A and B. Gives requirements for material, chemical composition, thickness, weight, width, and length; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 47L1c; 1942. Lead; Sheet.

References.—Methods of test, general requirements for metals, *see* 600.1, 651.0.

651.6 LEAD ALLOYS

International Assn. of Electrotypers and Stereotypers of America. Standards in Printing Plates, 1930. Includes formula for electrotype backing metal for lead alloyed with tin and antimony.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-16-2; 1944. Lead-Base Alloy, for Name Plates.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-92-1B; 1942. Lead-Antimony Alloys, for Bullet Cores and Shrapnel Balls.

References.—Babbitt metal, *see* 692.1; solder, *see* 693.1; methods of analysis, *see* 692.0.

651.7 LEAD COMPOUNDS AND SALTS

References.—Chemical compounds of lead, *see* 839.35.

651.8 LEAD PIPE

Collapsible Tube Mfrs. Assn. Lead, Tin-Coated and Tin-Lead Alloy Tube Data, 1941. Gives inside and outside dimensions and weights, for seven numbers, minimum wall thickness, and metal and moulded plastic cap data.

Lead Industries Assn. Standard for Lead Fittings. For use with lead pipe, includes regular and extra long straps and bends, medium and extra heavy weight sizes, dimensional diagrams, and requirements for purity of lead, manufacture, weight and weight tolerance, and marking.

Lead Industries Assn. Standard for Lead Pipe. Gives requirements as to purity of lead, wall thickness tolerances, classification, and table of outside dimensions and weight per foot for 3/8- to 6-in. nominal pipe sizes, manufacture, and marking.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Pipe; Lead. Covers definition, properties, solubility, grades and specifications, and uses.

U. S. Gov., Federal Specification WW-P-325; 1944. Pipe, Bends, and Traps; Lead (for) Plumbing and Water-Distribution. Covers lead pipe of one grade, one type, and six classes; lead traps of one grade, one class, and two types; drum traps of one grade, one class, and one type; lead bends of one grade, one class, and one type; and sizes to be as required. Gives requirements for material, workmanship, marking, dimensions and weights, screw caps and plugs, tolerances on weight, and details for each item; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 44P3e; 1944. Pipe; Lead, Lining, for Iron Pipe and Steel Tubing.

651.9 MISCELLANEOUS MANUFACTURES OF LEAD

International Assn. of Electrotypers and Stereotypers of America. Standards in Printing Plates, 1930. Includes thickness of unmounted electrotypes (ad plates and patent bases), thickness of curved plates, angle of bevel of patent base plates, quality of shell as to toughness and hardness, and formula for electrotype backing metal.

Lead Industries Assn. Standard for Calking Lead. Includes lead wool and other forms for calking purposes, requirements for purity of lead, maximum percentage of impurities, and marking.

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS94-41; 1941. Calking Lead. This standard covers chemical composition, certification, labeling, and packaging of one grade of calking lead available in pig, ingot, or wool form. Sponsored by Lead Industries Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS95-41; 1941. Lead Pipe. This standard covers chemical composition, inside and outside diameters, weight classification, weight per foot, defects, certification, and labeling of one grade of lead pipe. Maximum working pressures are included to assist in the selection of the proper classification of lead pipe for various purposes. Sponsored by Lead Industries Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS96-41; 1941. Lead Traps and Bends. This standard covers chemical composition, markings, weights, and dimensions, and provisions for allowable deviations, for one grade in various sizes of full S-traps, 1/2 S- or P-traps, drum traps, and bends. Sponsored by the Lead Industries Assn.

U. S. Gov., Federal Specification QQ-L-156; 1934. Lead; Calking. Covers one grade and two types—(I) pig lead and (II) lead wool. Gives requirements for material, workmanship, and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2512A; 1942. Letter and Number; Lead.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-16-1A; 1933. Washer; Lead, for Plug, Compound.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-5678; 1940. Foil; Submarine Mine.

References.—Methods of testing, general requirements for metals, *see* 600.1, 651.0, 692.0; lead carboys, *see* 955.2; chemical hand fire extinguishers of lead, *see* 973.3; storage batteries, *see* 712.2; lead pigments and paints, *see* 840-849.

652. MERCURY

American Dental Assn. Specification No.6; 1932. Dental Mercury. Technical requirements are identical with those of U. S. Pharmacopoeia.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. Twelfth Revision, 1942. Mercury (Quicksilver). Description, solubility, residue on ignition, foreign substances, and storage. U.S.P. products of mercury—Hydrargyrum cum Creta, Unguentum Hydrargyri Forte, Unguentum Hydrargyri Mite.

652.0 GENERAL ITEMS

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Mercury. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Standards Assn., Z 37.8-1943. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Mercury. To prescribe the maximum permissible concentration of mercury in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Gives properties of mercury, permissible concentration, sampling procedure, and analytical methods.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Mercury (Quicksilver). Covers definition, constants, derivation, grades, containers, and uses.

U. S. Gov., Navy Dept. Specification 51Mla; 1930. Mercury.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-38A; 1938. Mercury.

U. S. Gov., Veterans Administration. Specification VA-D-23; 1940. Mercury.

652.1 MERCURY COMPOUNDS AND SALTS

References.—Chemical compounds of mercury, *see* 839.36.

653. NICKEL

653.0 GENERAL ITEMS

American Society for Metals. Metals Handbook, 1939 edition. Constitution of Nickel Alloys and Properties of Nickel and Its Alloys. Covers constitution of nickel-aluminum, nickel-beryllium, nickel-carbon, nickel-chromium, nickel-cobalt, nickel-manganese, nickel-molybdenum, nickel-silicon, nickel-sulphur, nickel-tin, and nickel-zinc alloys; physical constants of pure nickel; properties of commercially pure wrought "A" nickel; properties of cast nickel; and properties of the various nickel alloys.

American Society for Metals. Metals Handbook, 1939 edition. Micrography of Nickel and Its Alloys and Technology of Nickel. Covers polishing nickel for metallographic examination, etching nickel for metallographic examination, forging nickel alloys, machining high nickel alloys, and grinding, polishing, and buffing high nickel alloys.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Nickel. Covers definition, constants, derivation, manufacture, impurities, specifications, forms available, uses, substitutes, and marketing.

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Nickel Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers nickel alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Alumel Wire, No.8 Gauge, Sample 118. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

653.1 NICKEL METAL, INGOTS, AND SHOT

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U.S., 1941. Metallic Nickel. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Iron and Steel Institute. Contributions to the Metallurgy of Steel—No.5. Possible Alternates for Nickel, Chromium, and Chromium-Nickel Constructional Alloy Steels, 1941. Possible alternates are confined to constructional alloy steels containing not more than the following percentages of the following elements—nickel 5.25, chromium 3.99, manganese 2.00, silicon 2.25, vanadium 0.25, and molybdenum 1.00.

American Society for Testing Materials, B 39-22; 1922. Nickel. Covers four grades of virgin nickel—electrolytic, suitable for high grades of malleable alloys; "X" shot, suitable for nonferrous alloys and nickel steel; "A" shot, suitable for manufacture of anodes; and ingot, suitable for open-hearth and electric furnace steel. Gives chemical compositions and methods of sampling each grade. Endorsed by the American Foundrymen's Assn.

U. S. Gov., Federal Specification QQ-N-301; 1932. Amendment 2; 1941. Nickel; (for) Remelting. Covers three grades—A, B, and C. Gives requirements for material, form (in cathodes, plates, pigs, ingots, cubes, or shot form, except grade A, which is in cathodes only), and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing, general requirements for metals, *see* 600.1, 853.0; nickel plating, *see* 800.3; chemical compounds of nickel, *see* 839.39.

653.2 NICKEL BARS AND RODS

American Society for Testing Materials, B160-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-160. Tentative Specifications for Nickel Rods and Bars. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, test specimens, methods of testing, permissible variations in dimensions and weight, straightness, special permissible variations, workmanship and finish, marking, inspection, special tests, and rejection.

653.3 NICKEL MANUFACTURES

653.31 Nickel Plate, Sheet and Strip

American Society for Testing Materials, B162-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-162. Tentative Specifications for Nickel Plate, Sheet, and Strip. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, Rockwell hardness, test specimens, methods of testing, permissible variations in thickness and weight, permissible variations in width and length, straightness, finished edges, squareness, flatness, special permissible variations, workmanship and finish, marking, inspection, special tests, rejection, rehearing.

653.32 Nickel Wire

American Society for Testing Materials, B 175-42 T; 1942. Tentative Specifications for Round Nickel Wire for Lamps and Electronic Devices. Cover round nickel wire 0.010 to 0.075 in. in diameter for use as side rods for grids, leads, and supports in lamps and electronic devices. Chemical composition, tensile properties, bending properties, resistivity, testing, dimensions and permissible variations, finish, spooling, marking, and rejection.

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

References.—Nickel-chromium wire, *see* 715.43; fourdrinier wire cloth of nickel wire, *see* 645.39.

653.33 Nickel Pipe and Tubing

American Society for Testing Materials, B161-41T-1941. A.S.M.E. Boiler Construction Code Specification SB-161. Tentative Specifications for Nickel Cold-Drawn Pipe and Tubing. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, expansion test, hydrostatic test, test specimens, methods of testing, permissible variations in dimensions and weight, workmanship and finish, marking, inspection, special tests, and rejection.

American Society for Testing Materials, B163-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-163. Tentative Specifications for Nickel, Nickel-Copper Alloy, and Nickel-Chromium-Iron Alloy Seamless Condenser Tubes and Ferrule Stock. Gives scope, material, manufacture, chemical composition, samples for chemical analysis, tensile properties, expansion test, hydrostatic test, number of tests, retests, methods of testing, permissible variations in dimensions and weight, workmanship and finish, marking, inspection, special tests, and rejection.

653.39 Miscellaneous Manufactures of Nickel

U. S. Gov., Federal Specification QQ-N-265; 1944. Amendment 1; 1944. Nickel; Anodes. Covers one grade and two types—(I) carbon and (II) oxide. Gives requirements for material and workmanship, chemical composition, size, shape, means for suspension, and identification; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-227A; 1942. Anode; Nickel.

654. NICKEL-COPPER ALLOYS (MONEL METAL)

654.0 GENERAL ITEMS

American Iron and Steel Institute. Contributions to the Metallurgy of Steel—No.5. Possible Alternates for Nickel, Chromium, and Chromium-Nickel Constructional Alloy Steels, 1941. Possible alternates are confined to constructional alloy steels containing not more than the following percentages of the following elements—nickel 5.25, chromium 3.99, manganese 2.00, silicon 2.25, vanadium 0.25, and molybdenum 1.00.

654.1 NICKEL-COPPER METAL, INGOTS, AND SHOT

American Society for Testing Materials, B 30-44T; 1944. Tentative Specifications for Copper-Base Alloys in Ingot Form for Sand Castings. Covers 25 copper-base alloys, with A.S.T.M. classifications, numerical, and commercial designations, and nominal compositions. Includes nickel-bronze. Gives requirements for manufacture, chemical analysis, marking, inspection, rejection and retesting, claims, and settlement of claims. Endorsed by American Foundrymen's Assn.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Copper-Nickel Alloy (Monel Metal). Covers definition, properties, constants, impurities, grades and forms available, containers, uses, and ordering instructions.

654.2 NICKEL-COPPER BARS

American Society for Testing Materials, B164-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-164. Tentative Specifications for Nickel-Copper Alloy Rods and Bars. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, test specimens, methods of testing, permissible variations in dimensions and weight, straightness, special permissible variations, workmanship and finish, marking, inspection, special tests, and rejection.

U. S. Gov., Navy Dept. Specification 46M7f; 1938. Wire, Nickel-Copper-Alloy; Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1.

654.3 STRIPS, NICKEL-COPPER

American Society for Testing Materials, B 122-42T; 1942. Tentative Specifications for Copper-Nickel-Zinc and Copper-Nickel Alloy Sheet and Strip. For seven classes of alloy. Gives requirements for basis of purchase, manufacture, chemical composition, tempers, tensile strength, hardness, grain size, tests, tolerances, finish, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-B 122; 1942, affected section 3, Manufacture.

U. S. Gov., Federal Specification QQ-N-281; 1940. Amendment 1; 1941. Nickel-Copper-Alloy; Forgings, Plates, Rods, Shapes, Sheets, Strips, and Wire. Includes cold-rolled strips (annealed, 1/4 hard, and hard stress relieved). Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46M7f; 1938. Wire, Nickel-Copper-Alloy; Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Standard gage and thicknesses, *see* 644.21, 654.52; *see* also references under 654.2.

654.4 SHAPES, NICKEL-COPPER

U. S. Gov., Federal Specification QQ-N-281; 1940. Amendment 1; 1941. Nickel-Copper Alloy; Forgings; Plates, Rods, Shapes, Sheets, Strips, and Wire. Includes shapes (annealed, cold-rolled, and hot-rolled). Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46M7f; 1938. Wire, Nickel-Copper Alloy; Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—*See* references under 654.2.

654.5 NICKEL-COPPER MANUFACTURES

654.51 Castings and Forgings, Nickel-Copper

Hydraulic Institute. Material Specification for Cast Nickel-Copper Alloy (Monel), No. 140; 1939. For resistance to corrosion and a reasonable degree of castability in simpler shapes; requirements for manufacture, chemical composition, test coupons, physical properties and tests, pattern equipment, workmanship, welding, hydrostatic tests, and inspection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Forgings. Covers definition, characteristics, classes of forgings, forgeable metals, and commercial forging practice.

U. S. Gov., Army Air Forces. Specification 11084; 1940. Nickel-Copper Alloy; Castings.

U. S. Gov., Federal Specification QQ-C-551; 1933. Copper-Nickel Alloy; Castings. Covers one grade. Gives requirements for quality and condition, repairing of defects, chemical composition, and physical requirements; methods of inspection and tests; and requirements for packing and marking.

U. S. Gov., Federal Specification QQ-N-281; 1940. Amendment 1; 1941. Nickel-Copper Alloy; Forgings, Plates, Rods, Shapes, Sheets, Strips, and Wire. Includes forgings (hot finished and high-tensile). Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46M1g; 1944. Nickel-Copper Alloy; Castings.

References.—Methods of testing, general requirements for metals, *see* 600.1.

654.52 Sheets and Plates, Nickel-Copper

American Society for Testing Materials, B 122-42T; 1942. Tentative Specifications for Copper-Nickel-Zinc and Copper-Nickel Alloy Sheet and Strip. For seven classes of alloy. Gives requirements for basis of purchase, manufacture, chemical composition, tempers, tensile strength, hardness, grain size, tests, tolerances, finish, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-B 122; 1942, affected section 3, Manufacture.

American Society for Testing Materials, B127-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-127. Tentative Specifications for Nickel-Copper Alloy Plate, Sheet, and Strip. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, Rockwell hardness, test specimens, methods of testing, permissible variations in thickness and weight, permissible variations in width and length, straightness, finished edges, squareness, flatness, special permissible variations, workmanship and finish, marking, inspection, special tests, rejection, and rehearing.

U. S. Gov., Federal Specification QQ-N-281; 1940. Amendment 1; 1941. Nickel-Copper Alloy; Forgings, Plates, Rods, Shapes, Sheets. Strips, and Wire. Includes cold-rolled sheets (annealed, satin finish, and hard stress relieved), and plates (annealed, hot-rolled, and hot-rolled and stress relief annealed). Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46M7f; 1938. Nickel-Copper Alloy; Bars, Plates, Rods, Shapes, Sheets, Strips, and Wire.

References.—Standard gage and thickness for nonferrous alloy plates and sheets, *see* 644.21; *see* references under 654.51.

654.53 Rods, Nickel-Copper

American Society for Testing Materials, B164-41T; 1944. A.S.M.E. Boiler Construction Code Specification SB164. Tentative Specifications for Nickel-Copper Alloy Rods and Bars. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, test specimens, methods of testing, permissible variations in dimensions and weight, straightness, special permissible variations, workmanship and finish, marking, inspection, special tests, and rejection.

U. S. Gov., Federal Specification QQ-N-281; 1940. Amendment 1; 1941. Nickel-Copper Alloy; Forgings, Plates, Rods, Shapes, Sheets, Strips, and Wire. Includes cold-drawn and hot-drawn rods (class A) nickel-copper-alloy; and cold-drawn and hot-drawn rods (class B) nickel-copper-alloy, free machining. Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-R-571; 1932. Rods; Welding, Nonferrous (for) Gas Welding. Includes type F—copper-nickel alloy. Gives requirements for chemical composition, weldability, character of weld metal, physical properties, sizes, and lengths; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 46M7f; 1938. Nickel-Copper Alloy; Bars, Plates, Rods, Shapes, Sheets, Strips, and Wire.

U. S. Gov., Navy Dept. Specification 46R1b; 1933. Rods; Welding, Nonferrous (for Gas Welding).

References.—See references under 654.51.

654.54 Wires and Cables, Nickel-Copper

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

U. S. Gov., Army Air Forces. Specification 11350; 1942. Wire, Nickel-Copper-Aluminum Alloy; Spring Temper (Non-Magnetic).

U. S. Gov., Federal Specification QQ-N-281; 1940. Amendment 1; 1941. Nickel-Copper Alloy; Forgings, Plates, Rods, Shapes, Sheets, Strips, and Wire. Includes cold-drawn wire (annealed, No.1 temper, regular temper, and four spring tempers). Gives requirements for material, workmanship, chemical composition, tensile properties, physical properties, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46M7f; 1938. Nickel-Copper Alloy; Bars, Plates, Rods, Shapes, Sheets, Strips, and Wire.

U. S. Gov., Navy Dept. Specification 46N5a; 1941. Wire, Nickel-Copper-Aluminum Alloy; Forgings, Rods, Strip.

654.59 Miscellaneous Manufactures of Nickel-Copper

American Hospital Assn., 4-10. Wire Screen Cloth. Covers copper, commercial bronze (brass), bronze, iron or steel, galvanized (zinc coated), copper-nickel alloy, corrosion-resisting steel (chromium-nickel), aluminum alloy, iron or steel, japanned or painted, and chromium-nickel alloy. Based on U. S. Gov. Federal Specifications RR-C-541a for Wire Screen Cloth and QQ-M-151a for General Specification for Inspection of Metals.

American Society for Testing Materials, B111-43; 1943. A.S.M.E. Boiler Construction Code Specification SB-111. Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock. For use in surface condensers, evaporators, and heat exchangers. Gives requirements for material, manufacture, chemical composition, sample for chemical analysis, microscopic examination, expanding test, mercurous nitrate test, hydrostatic test, dimension and weight tolerances, workmanship, finish, and inspection. A.S.T.M. Emergency Alternate Provision EA-B-111; 1942, affected section 3, Material.

American Society for Testing Materials, B163-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-163. Tentative Specifications for Nickel, Nickel-Copper Alloy, and Nickel-Chromium-Iron Alloy Seamless Condenser Tubes and Ferrule Stock. Gives scope, material, manufacture, chemical composition, samples for chemical analysis, tensile properties, expansion test, hydrostatic test, number of tests, retests, methods of testing, permissible variations in dimensions and weight, workmanship and finish, marking, inspection, special tests, and rejection.

American Society for Testing Materials, B165-41T; 1941. A. S. M. E. Boiler Construction Code Specification SB-165. Tentative Specifications for Nickel-Copper Alloy Cold-Drawn Pipe and Tubing. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, expansion test, hydrostatic test, test specimens, methods of testing, permissible variations in dimensions and weight, workmanship and finish, marking, inspection, special tests, and rejection.

References.— Fourdrinier wire cloth of monel metal, *see* 645.39.

655. NICKEL-COPPER-ZINC ALLOYS (NICKEL SILVER AND GERMAN SILVER)

655.0 GENERAL ITEMS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Nickle Silver and Cupro-Nickel. Covers definition, grades and characteristics, constants, forms available, specification, and uses.

655.1 BARS, NICKEL-COPPER-ZINC ALLOY

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Nickel Brass (Nickel Silver), Designation 10A. Gives chemical analysis and physical properties of the alloy. This standard is similar to A. S.T.M. Specification B30-40T (10A). Nominal chemical composition of this alloy is copper 57.00, tin 2.00, lead 9.00, zinc 20.00, nickel 12.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Nickel Brass (Nickel Silver), Designation 10B. Gives chemical analysis and physical properties of the alloy. This standard is similar to A. S.T.M. Specification B30-40T (10B). Nominal chemical composition of this alloy is copper 60.00, tin 3.00, lead 5.00, zinc 16.00, nickel 16.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Nickel Bronze (Nickel Silver), Designation 11A. Gives chemical analysis and physical properties of the alloy. This standard is similar to A. S.T.M. Specification B30-40T (11A); and Federal Specifications FF-H-106, FF-H-136, FF-H-121a, FF-H-116a, FF-H-111, and WW-P-541. Nominal chemical composition of this alloy is copper 64.00, tin 4.00, lead 4.00, zinc 8.00, nickel 20.00.

Non-Ferrous Ingot Metal Institute. 1940 Manual. Leaded Nickel Bronze (Nickel Silver), Designation 11B. Gives chemical analysis and physical properties of the alloy. This standard is similar to A. S.T.M. Specification B30-40T (11B). Nominal chemical composition of this alloy is copper 66.50, tin 5.00, lead 1.50, zinc 2.00, nickel 25.00.

U. S. Gov., Federal Specification QQ-N-321; 1933. Amendment 2; 1942. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes two compositions (A and B) for bars. Gives requirements for material, workmanship, chemical composition, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46S3d; 1936. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1.

655.2 SHEETS AND PLATES, NICKEL-COPPER-ZINC ALLOY

American Society for Testing Materials, B 122-42T; 1942. Tentative Specifications for Copper-Nickel-Zinc and Copper-Nickel Alloy Sheet and Strip. For seven classes of alloy. Gives requirements for basis of purchase, manufacture, chemical composition, tempers, tensile strength, hardness, grain size, tests, tolerances, finish, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-B 122; 1942, affected section 3, Manufacture.

U. S. Gov., Federal Specification QQ-N-321; 1933. Amendment 2; 1942. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes two compositions (A and B) for sheets and plates. Gives requirements for material, workmanship, chemical composition, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46S3d; 1936. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—Standard gage and thicknesses of nonferrous alloy sheets and plates, *see* 644.21; *see* references under 655.1.

655.3 SHAPES AND CASTINGS, NICKEL-COPPER-ZINC ALLOY

American Society for Testing Materials, B149-44T; 1944. Tentative Specifications for Leaded Nickel-Brass (Leaded Nickel-Silver) and Leaded Nickel-Bronze (Leaded Nickel-Silver) Sand Castings. Cover castings of four alloys. Basis of purchase, manufacture, chemical composition, chemical analysis, methods of chemical analysis, pressure and fracture tests, test specimens, number of tests, methods of testing, workmanship and finish, marking, inspection and rejection.

U. S. Gov., Federal Specification QQ-N-321; 1933. Amendment 2; 1942. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes two compositions (A and B) for shapes. Gives requirements for material, workmanship, chemical composition, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46S3d; 1936. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips.

References.—*See* references under 655.1.

655.4 STRIPS, NICKEL-COPPER-ZINC ALLOY

American Society for Testing Materials, B 122-42T; 1942. Tentative Specifications for Copper-Nickel-Zinc and Copper-Nickel Alloy Sheet and Strip. For seven classes of alloy. Gives requirements for basis of purchase, manufacture, chemical composition, tempers, tensile strength, hardness, grain size, tests, tolerances, finish, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-B 122; 1942, affected section 3, Manufacture.

U. S. Gov., Federal Specification QQ-N-321; 1933. Amendment 2; 1942. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes two compositions (A and B) for strips. Gives requirements for material, workmanship, chemical composition, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46S3d; 1936. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-220A; 1942. Wire, Copper-Zinc-Nickel; Resistance Alloy.

References.—*See* references under 655.1.

655.5 WIRES AND RODS, NICKEL-COPPER-ZINC ALLOY

American Society for Testing Materials, B151-44T; 1944. Tentative Specifications for Copper-Nickel-Zinc Alloy Rod, Bar, and Wire. Covers round, rectangular, square, hexagonal, or octagonal sections in three alloys, i.e., for general use; for use generally in hard or spring temper; and for use where ease of machining is important. Basis of purchase, manufacture, chemical composition, sampling for chemical analysis, tempers of cold-drawn and annealed, tensile properties of drawn tempers, grain size of annealed tempers, number of tests, methods of testing, tolerances, finish, inspection, and rejection.

U. S. Gov., Federal Specification QQ-N-321; 1933. Amendment 2; 1942. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips. Includes two compositions (A and B) for wires and rods. Gives requirements for material, workmanship, chemical composition, and permissible variations in dimensions; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46S3d; 1936. Nickel-Silver (German Silver); Bars, Plates, Rods, Shapes, Sheets, and Strips.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-220A; 1942. Wire, Copper-Zinc-Nickel; Resistance Alloy.

References.—Methods of analysis and testing of high resistance electrical wire, *see* 715.43; *see* references under 655.1.

655.6 HOLLOW AND STAMPED WARE, NICKEL-COPPER-ZINC ALLOY

References.—See references under 655.1.

655.9 MISCELLANEOUS SPECIFICATIONS FOR NICKEL-COPPER-ZINC ALLOY

References.—German silver contacts for telephone jacks, *see* 718.29; drawing instruments of nickel silver, *see* 935; methods of testing, general requirements for metals, *see* 600.1.

656. NICKEL-CHROME ALLOY

656.0 GENERAL ITEMS

American Society for Testing Materials, B167-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-167. Tentative Specifications for Nickel-Chromium-Iron Alloy Cold-Drawn Pipe and Tubing. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, expansion test, hydrostatic test, test specimens, methods of testing, permissible variations in dimensions and weight, workmanship and finish, marking, inspection, special tests, and rejection.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP474; 1932. Tensile Properties of Cast Nickel-Chromium-Iron Alloys and of Some Alloy Steels at Elevated Temperatures. Gives tensile properties, as determined by short-time tests, of cast nickel-chromium-iron alloys and alloy steels.

References.—Electrical testing of materials for electrical heating, *see* 715.43; nickel chromium alloys for electrical heating elements, *see* 715.43; ferro alloy castings, *see* 622.5.

656.1 NICKEL-CHROME METALS AND ALLOYS

American Society for Testing Materials, B82-41; 1941. Drawn or Rolled Alloy, 80 Percent Nickel, 20 Percent Chromium, for Electrical Heating Elements. Covers annealed drawn or rolled shapes. Gives heat treatment, chemical composition, chemical analysis, elongation, nominal resistivity, test for resistivity, resistance increase with temperature test, for change of resistance, durability, finish, packing, and marking.

American Society for Testing Materials, B83-41; 1941. Drawn or Rolled Alloy, 60 Percent Nickel, 15 Percent Chromium, and Balance Iron, for Electrical Heating Elements. Cover annealed drawn or rolled shapes. Heat treatment, chemical composition, chemical analysis, elongation, nominal resistivity, test for resistivity, resistance increase with temperature, test for change of resistance, durability, finish, packing, and marking.

American Society for Testing Materials, B163-41T-1941. A.S.M.E. Boiler Construction Code Specification SB-163. Tentative Specifications for Nickel, Nickel-Copper Alloy, and Nickel-Chromium-Iron Alloy Seamless Condenser Tubes and Ferrule Stock. Gives scope, material, manufacture, chemical composition, samples for chemical analysis, tensile properties, expansion test, hydrostatic test, number of tests, retests, methods of testing, permissible variations in dimensions and weight, workmanship and finish, marking, inspection, special tests, and rejection.

American Society for Testing Materials, B166-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-166. Tentative Specifications for Nickel-Chromium-Iron Alloy Rods and Bars. Gives scope, material, manufacture, chemical composition, lots, sampling, samples for chemical analysis, tensile properties, test specimens, methods of testing, permissible variations in dimensions and weight, straightness, special permissible variations, workmanship and finish, marking, inspection, special tests, and rejection.

American Society for Testing Materials, B168-41T; 1941. A.S.M.E. Boiler Construction Code Specification SB-168. Tentative Specifications for Nickel-Chromium-Iron Alloy Plate, Sheet, and Strip. Gives scope, material, manufacture, lots. sampling, samples for chemical analysis, tensile properties, Rockwell hardness, test specimens, methods of testing, permissible variations in thickness and weight, permissible variations in width and length, straightness, finished edges, squareness, flatness, special permissible variations, workmanship and finish, marking, inspection, special tests, rejection, and rehearing.

656.2 NICKEL-CHROME PLATES, SHEETS, AND STRIPS

Society of Automotive Engineers. Aeronautical Material Specification 5540A; 1941. Sheet and Strip, Corrosion and Heat Resistant, Nickel-Chromium-Iron Alloy. Gives requirements for composition, condition, quality, tolerance, reports, and rejections. Similar specifications: Army-Navy Aeronautical AN-QQ-N-271.

U. S. Gov., Army Air Forces. Specification 11355; 1944. Nickel-Chromium-Iron Alloy; Plate and Shapes.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-N-271a-2; 1942. Nickel-Chromium-Iron Alloy; Sheet and Strip.

U. S. Gov., Navy Dept. Specification 47N1a; 1938. Nickel-Chromium-Iron Alloy; Bars, Forgings, Rods, Shapes, Sheets, Strips, and Wire.

656.3 NICKEL-CHROME TUBING

Society of Automotive Engineers. Aeronautical Material Specification 5580A; 1941. Seamless Tubing, Corrosion- and Heat-Resistant Nickel-Chromium-Iron Alloy. Gives requirements for composition, condition (cold drawn annealed), quality, tolerance, reports, identification, and rejections. Similar specifications: Army 57-174, Type IV, Class B; and Navy 49 T 13.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-T-831-1; 1942. Tubing; Nickel-Chromium-Iron Alloy; Seamless, Round.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-T-833-1; 1944. Tubing; Nickel-Chromium-Iron Alloy, Welded Round.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-174A; 1940. Nickel-Chromium-Iron Alloys; Bars, Rods, Tubing, Seamless and Welded, Wire and Welding Rod.

656.4 NICKEL-CHROME BARS, RODS, AND SHAPES

Society of Automotive Engineers. Aeronautical Material Specification No.5665; 1940. Nickel-Chromium-

Iron Alloy. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, tolerance, reports, and rejections. Similar Specifications: Army 57-174, Type I; Navy 47 N 1, Types I and II.

Society of Automotive Engineers. Aeronautical Material Specification No.5682; 1942. Coating Alloy (Nickel-Chromium). For rods, wire, or as ordered. Covers requirements for use, composition, condition, quality, reports, identification, and rejections.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-N-268-1; 1942. Nickel-Chromium-Iron Alloy; Bars, Forgings, and Rods.

U. S. Gov., Army Air Forces. Specification No.11355; 1944. Nickel-Chromium-Iron Alloy; Plate and Shapes.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-4-1; 1944. Nickel-Chromium-Iron Alloy; Wire and Welding Rod.

U. S. Gov., Navy Dept. Specification 46N4b; 1943. Nickel-Chromium Alloy; Rods, for Boiler Refractory Anchor Bolts.

U. S. Gov., Navy Dept. Specification 47N1a; 1938. Nickel-Chromium-Iron Alloy; Bars, Forgings, Rods, Shapes, Sheets, Strips, and Wire.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-174A; 1940. Nickel-Chromium-Iron Alloy; Bars, Rods, Tubing, Seamless and Welded, Wire and Welding Rod.

656.5 NICKEL-CHROME CASTINGS

656.6 NICKEL-CHROME FORGINGS

Society of Automotive Engineers. Aeronautical Material Specification No.5665; 1940. Nickel-Chromium-Iron Alloy. For bars, billets, forgings, or as ordered. Gives requirements for composition, condition, quality, tolerance, reports, and rejections.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-N-268-1; 1942. Nickel-Chromium-Iron Alloy; Bars, Forgings, and Rods.

U. S. Gov., Navy Dept. Specification 47N1a; 1938. Nickel-Chromium-Iron Alloy; Bars, Forgings, Rods, Shapes, Sheets, Strips, and Wire.

656.7 NICKEL-CHROME WIRE

American Hospital Assn., 4-10. Wire Screen Cloth. Covers copper, commercial bronze (brass), bronze, iron or steel, galvanized (zinc coated), copper-nickel alloy, corrosion-resisting steel (chromium-nickel), aluminum alloy, iron or steel, japanned or painted, and chromium-nickel alloy. Based on U. S. Gov., Federal Specifications RR-C-541a for Wire Screen Cloth and QQ-M-151a for General Specification for Inspection of Metals.

Society of Automotive Engineers. Aeronautical Material Specification No.5682; 1942. Coating Alloy (Nickel-Chromium). For rods, wire, or as ordered. Covers requirements for use, composition, condition, quality, reports, identification, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification No.5683; 1940. Wire; Corrosion-Resistant, Nickel-Chromium-Iron Alloy (Welding). Covers requirements for composition, condition, quality, tolerance, reports, and rejections. Similar Specifications: Army 57-174, Type IV, Class B; Navy 46 R 6.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-4-1; 1944. Nickel-Chromium-Iron Alloy; Wire and Welding Rod.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Chromel Wire, No.8 Gauge, Sample 119. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Navy Dept. Specification 47N1a; 1938. Nickel-Chromium-Iron Alloy; Bars, Forgings, Rods, Shapes, Sheets, Strips, and Wire.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-174A; 1940. Nickel-Chromium-Iron Alloy; Bars, Rods, Tubing, seamless and Welded, Wire and Welding Rod.

660-669 PRECIOUS METALS, METAL JEWELRY, AND PLATED WARE

661. PLATINUM AND PLATINUM JEWELRY

American Gem Society, 1943. Condensed from Commercial Standard CS66-38. Platinum Jewelry. To be stamped "platinum" (or "plat.") articles must contain, if made without solder, 98 1/2 percent of the platinum metals; if made with solder, 95 percent of the platinum metals. In stamping, platinum metals refer to metals of which 90 percent is pure platinum. Articles containing less than 50 percent platinum must be marked with the percentage of other metal and the word "platinum" cannot be used. Platinum or gold articles containing 5 percent or more of platinum may be stamped with the karat of gold followed by the words "and platinum."

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Metallic Platinum. Chemical symbol, synonyms, description, and preparations for tincture, solution, dilutions, medications, and triturations for use in homoeopathic medicines.

American Society of Metals. Metals Handbook, 1939 edition. Properties of Platinum Metals. Covers physical constants of platinum and platinum group metals and properties of platinum and platinum group metals.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Platinum. Covers definition, constants, solubility, derivation, grades and forms, uses, and commercial alloys.

U S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS66-38; 1938. Marking of Articles Made Wholly or in Part of Platinum. This standard covers the marking of articles made wholly or in part of platinum, as therein defined, offered for sale in the U. S. A. It includes also definitions, application of quality marks, contents as to quality, and a recommended wording of quality label or a tag to accompany the article. Sponsored by the Jewelry Crafts Assn.

662. GOLD AND DENTAL GOLD ALLOYS

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Prize Medals. Requirements for size, quality, and weight of gold, silver, and bronze medals for junior, senior, and team.

American Dental Assn. Specification No: 5; 1932. Inlay Casting Gold Alloys. Technical requirements are similar to those of U. S. Gov. Federal Specification QQ-G-540, Gold; Casting, Inlay, Dental.

American Dental Assn. Specification No. 7; 1932. Wrought Gold Wire Alloys. Covers composition, fusion temperature, ultimate tensile strength, yield strength, elongation, color, methods of inspection and test, and packing.

American Gem Society, 1943. Condensed from Commercial Standard CS47-34. Gold Covered Jewelry. The quality mark "gold filled" or "rolled gold plate" shall refer to articles (except watch cases) made of base metal upon one or more sides of surfaces of which base metal there is affixed by soldering, brazing, welding, or mechanical means a sheet or sheets or shell of karat gold. "Gold filled" mark states correct proportion of alloyed gold to weight of entire metal and the actual karat fineness of the gold covering. If weight of the alloyed gold to the weight of the entire metal is less than 1/20th 12K, such article may be marked "rolled gold plate."

American Gem Society, 1943. Gold Jewelry. "Fine Gold" means gold of 24 karat quality. The term "solid gold" shall be applied only to fine gold. Karat preceded by a whole number indicates the number of 24th parts of fine gold contained in the alloy. No quality mark less than 10 karat fineness is applied. Covers articles with hollow centers, trade mark, and name of manufacturer.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Metallic Gold. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Society for Metals. Metals Handbook, 1939 edition. Constitution of Gold Alloys and properties. Covers constitution of gold-copper alloys, constitution of gold-silver alloys, gold alloys, and properties of gold-copper-nickel-zinc alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Scientific Paper S532; 1926. Analysis of Dental Gold Alloys. Describes methods developed at Bureau for sampling the alloys and for detection and determination of silver, iridium, tin, gold, palladium, copper, rhodium, zinc, nickel, manganese, iron, magnesium, with typical analyses of several alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS47-34; 1934. Marking of Gold Filled and Rolled Gold Plate Articles Other Than Watchcases. This standard covers the marking of gold-covered articles therein defined, other than watchcases, offered for sale in the U. S. A. It also gives nomenclature and definitions, refers to quality marks and general requirements relating to tolerances, trade-mark, and style mark. This commercial standard was approved as American Standard Z31-1933 by the American Standards Assn. Sponsored by New England Manufacturing Jewelers' and Silversmiths' Assn. and Rolled Gold Platers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS67-38; 1938. Marking Articles Made of Karat Gold. This standard covers the marking of articles made of karat gold, as therein defined, offered for sale in the U. S. A. It also includes definitions, requirements for quality marks, and general requirements relating to tolerance, trade-mark, class, or style mark. It also includes a recommended wording of quality label or a tag to accompany the article. Sponsored by the New England Manufacturing Jewelers' and Silversmiths' Assn.

U. S. Gov., Federal Specification QQ-G-540; 1940. Amendment 1; 1941. Gold; Casting, Inlay, Dental. Covers four types—(I) soft, (II) medium, (III) hard, and (IV) extra hard. Gives requirements for material, workmanship, color, castings, physical characteristics, and composition; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-G-566; 1936. Gold-Leaf. Covers gold alloy (95 percent pure gold) sheets, furnished in books with gold leaf loosely placed between the leaves. Gives detail requirements; methods of sampling and testing; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2138; 1933. Gold Wire.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2458A; 1944. Gold; Lingual Bars.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2707A; 1945. Gold Plate.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2888; 1939. Gold Foil.

663. SILVER

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Prize Medals. Requirements for size, quality, and weight of gold, silver, and bronze medals for junior, senior, and team.

American Gem Society, 1943. Condensed from Commercial Standard CS51-35. Jewelry of Sterling Silver in Combination With Gold. An article in which the parts of the two metals are not visibly separable and easily distinguishable may use a quality mark including the term "sterling and" or "sterling +," followed by the weight of the alloyed gold and weight of the entire article. The karat gold mark may not be used unless the alloyed gold content is at least 1/20th of the weight of the entire metal. Where silver and gold are so combined as to be visibly separable and easily distinguishable, the quality mark "sterling" and the karat mark may be used.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS51-35; 1935. Marking Articles Made of Silver in Combination With Gold. This standard covers the marking of articles made of sterling silver in combination with gold, as herein defined, offered for sale in the U. S. A. It includes also definitions, requirements for quality marks, and general requirements relating to tolerance, trade marks, and style marks. This standard was approved as American Recommended Practice by the American Standards Assn. Sponsored by New England Manufacturing Jewelers' and Silversmiths' Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 118-44; 1944. Marking of Jewelry and Novelties of Silver. Covers the marking of silver articles commonly or commercially known as jewelry or novelties (other than flatware, hollow ware and toilet-ware) offered for sale in the U. S. Gives definitions, requirements for quality marks, tolerance, exemptions, trade mark, and class pattern, type, or style mark.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-23A; 1942. Silver.

References.—Silver and silverware, *see* 691.

670-679 CLOCKS, WATCHES, AND DIALS

670. GENERAL ITEMS

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 12—Measurement of Time, 1942. Describes the following time-telling mechanisms or timekeepers and discusses their accuracy, use, and care: General purpose clocks, chronometers, high-grade clocks or regulators, precision clocks, watches and stop watches, timers, chronographs, and oscillographs.

671. CLOCKS

U. S. Gov., Army Air Forces. Specification 27470; 1943. Clock; Type A-12 (Aircraft).

U. S. Gov., Army-Navy Aeronautical Specification AN-C-62; 1942. Clocks; 2 3/4-Inch Dial Civil Date Elapsed Time.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-99-1; 1944. Clocks; 1 7/8-Inch Dial.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 99-S. Clock; Alarm.

U. S. Gov., Federal Specification GG-C-451; 1935. Clocks; Pendulum (for) General Purposes. Covers three types—(I) floor, (II) wall, and (III) shelf; two grades—(B) rate not greater than 30 seconds per week, and (C) rate not greater than 120 seconds per week; and four classes—(1) weight driven, motor wound, (2) Weight driven, hand wound, (3) spring driven, magnet wound, and (4) spring driven, hand wound. Gives requirements for cases, movements, and driving mechanism; method of inspection and tests; and requirements for packing and marking of shipment.

U. S. Gov., Federal Specification GG-C-466; 1935. Clocks; Synchronous-Motor (for) General Purposes. Covers three types—(I) floor, (II) wall, and (III) shelf; two grades—(A) without current failure standby and (B) with current failure standby; and two classes—(1) self-starting motors, (2) nonself-starting motors. Gives requirements for cases and movements; methods of inspection and tests; and requirements for packing and marking of shipments. Amendment No. 3; 1943, changes two grades to one grade, corrosion-resisting metal, finish, construction details, and deletes current failure standby.

U. S. Gov., Marine Corps Specification, 1942. Clock; Alarm.

U. S. Gov., Marine Corps Specification, 1933. Clock; Eight-Day.

U. S. Gov., Navy Dept. Specification 18C5c; 1934. Clocks; Boat.

U. S. Gov., Navy Dept. Specification 18C11c; 1938. Clocks; Mechanical (Shipboard Use Other Than as Deck Clocks).

U. S. Gov., Navy Dept. Specification 18C13; 1931. Clocks; Deck.

U. S. Gov., Navy Dept. Specification 18C19; 1941. Clocks; Interval-Timer, Alarm-Clock Pattern.

U. S. Gov., Navy Dept. Specification 18C22; 1943. Clocks; Small, With Second Hand.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Clocks; Marine, 1944. Phenolic plastic case, polished, 6-in. dial, nonstriking.

U. S. Gov., Treasury Dept., Procurement Div., 446b; 1942. Clocks; Watchman's. Covers portable clock with carrying case and strap. Gives detail requirements as to case, movement, registering mechanism, and methods of sampling, inspection, and tests.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2222A; 1941. Clock; Interval Timer.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-376A; 1928. Clock; Type 1-55.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-3a; 1943. Clocks; Marine, Mechanical. Shall be one grade and four types—(I) nonstriking-deck (6-in. dial), (II) ship's bell (6-in. dial-luminous marking), (III) engine room (8 1/2-in. dial), and (IV) radio room (6-in. dial). Gives requirements for materials, workmanship, construction, movement, case, bezel ring, dial, keys, hands, crystal, and details for each type; inspection, sampling, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-6 (Tentative) 1943. Clocks; Zigzag Control. Covers one type and grade. Gives requirements for materials, workmanship, construction, movement, dials, hands, audible signal time selector, audible signal system case, finish, and instructions; inspection and methods of test; packaging, packing, and marking.

References.—Electric time clock systems, *see* 718.35; testing of timepieces, *see* 672; measurement of time, *see* 700.

672. WATCHES

U. S. Gov., Army-Navy Aeronautical Specification AN-W-9; 1943. Watches; Navigational Stop.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-W-108-1; 1943. Watches; Navigation, Master.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C432; 1941. Testing of Timepieces. This circular describes in detail the six standard tests used at the National Bureau of Standards in the testing of watches and chronometers. These tests consist in four tests for pocket watches, namely—class A; class B; railroad precision; and business precision; a test for stop watches of various grades; and a test for ship chronometers. Information is given regarding the use and care of a watch, watch sizes, watch jewels, watch-testing machines, standard time zones and time signals. Directions and general information for the submittal of timepieces for test are also given.

U. S. Gov., Federal Specification DD-W-131; 1943. Watch-Glasses. Covers two classes—(A) resistance glass and (B) ordinary glass; and thirteen sizes. Gives requirements for material, workmanship, physical requirements, shock test, boiling test, annealing, tolerance, and wrapping; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-W-111a; 1934. Amendment 2; 1939. Watches; Stop. Covers stop watches having sweep hands making one revolution a minute; six types—(A) noncontinuous-running; (B) continuous-running, single-action; (C) continuous-running, double-action; (D) combination, single-action; (E) combination, double-action; and (F) noncontinuous-running, time-out. Each class is designated by a number corresponding to the number of jewels in the movement, viz.—classes 0, 6, 7, 11, 15, 17, and 18. Gives detail requirements; method of inspection and test; and requirements for packing and marking shipments.

U. S. Gov., Marine Corps Specification, 1943. Watch; Wrist, Seven to Fifteen-Jewel.

U. S. Gov., Navy Dept. Specification 18W1d; 1943. Watches; Stop, Timer, Navigation.

U. S. Gov., Navy Dept. Specification 18W3d; 1943. Watches; Comparing.

U. S. Gov., Navy Dept. Specification 18W4c; 1931. Watches; Torpedo-Boat.

U. S. Gov., Navy Dept. Specification 18W5; 1931. Watches; Stop, Chronograph.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-27749; 1940. Watch; Navigation, Type A-8 (Ground Speed).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 55-1B; 1940. Watch; Wrist, 7-Jewel.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 55-4A; 1926. Watch; Pocket, 7-Jewel.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 55-5A; 1926. Watch; Pocket, 15-Jewel or More.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 55-8A; 1926. Watch; Wrist, 15-Jewel or More.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 55-16; 1939. Watch; Pocket, Railroad Grade.

673. DIALS

U. S. Gov., Navy Dept. Specification 18D2; 1944. Dials; Pelorus, Plastic.

680-689 TIN AND ZINC

681. TIN

681.0 GENERAL ITEMS

American Society for Metals. Metals Handbook 1939 edition. Constitution of Tin Alloys, Structure of Tin Alloys, and Properties of Tin and Its Alloys. Covers constitution of tin-antimony, tin-bismuth, tin-cadmium, tin-copper, and tin-phosphorus alloys; constitution of tin-antimony-copper alloys used as bearing metals; structure of tin-antimony-copper alloys used as bearing metals; physical constants of tin; and properties of tin-base bearing alloys.

American Society for Metals. Metals Handbook, 1939 edition. Micrography and Technology of Tin. Covers preparation and etching of tin and tin alloys for metallographic examination and manufacture and properties of tin and tin alloy die castings.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Tin. Covers definition, constants, production and consumption, uses, secondary tin, smelters, prices, markets and trading, and packing.

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Tin Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers tin alloys, babbitts, solders, and brazing alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C66; 1917. Standard Samples for Thermometric Fixed Points. Description of preparation of pure samples of tin, their chemical analyses, freezing points, and degree of purity, used for the standardization of thermocouples, pyrometers, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Tin, Sample 42d. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Tin Ore (Bolivian Concentrate), Sample 137; and Tin Ore (N. E. I. Concentrate), Sample 138. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

681.1 TIN INGOTS AND PIG METAL

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Metallic Tin. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Society for Testing Materials, B 29-43; 1943. American Assn. of State Highway Officials, M 112-40. Pig Lead. For refined lead in pig form made from ore or other material by reduction and refining, but not for reclaimed lead. Gives requirements for types, manufacture, chemical composition, samples for chemical analysis, methods of chemical analysis, marking, and claims.

American Society for Testing Materials, E 25-37 T; 1937. Tentative Method of Quantitative Spectrochemical Analysis of High Grade Pig Lead. This method may be applied to any high grade lead, provided the impurities to be determined are not present in quantities over 0.1 percent. Covers preparation of sample, preliminary estimation, final estimation, and testing for compliance with specification.

U. S. Gov., Federal Specification QQ-T-371a; 1944. Tin; Pig. Covers one grade, designated grade A. Gives chemical composition; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46T1d; 1924. Tin; Pig.

References.—General requirements for metals, *see* 600.1.

681.2 TIN SHEETS

References.—Roofing tin, terneplate, *see* 604.31.

681.3 TIN CASTINGS

American Society for Testing Materials, B 102-44; 1944. Lead- and Tin-Base Alloy Die Castings. For pressure die castings from five designated alloys. Gives requirements for chemical compositions, sampling, density, soundness, finish, permissible variations in dimensions, and rejection.

681.4 TIN MANUFACTURES

681.41 Tin Hollow Ware

American Bakers Assn. Recommended Pan Sizes. Covers four sizes of pans for loaves of bread weighing 12, 16, 20, and 24 oz. baked.

Assn. of American Railroads, Purchases and Stores Div. Tin and Sheet Metalware, Standardization of, 1934. Gives dimensional requirements and illustration for torches, squirt cans, valve oilers, tallow pot, oil carriers, card cases, marking pot, funnels, measures, oil cans, coal hod, pails, fire bucket, soil can, refuse and garbage can.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 144-S. Funnel; Filter-Type.

U. S. Gov., Federal Specification RR-P-62; 1940. Pans; Cake, Tinned, Round. Covers one type, one grade, and two sizes—9 3/8 and 10 3/8 in. outside diameter at top of pan. Gives requirements for material, workmanship, tinned plate gage, tolerance, weight of tin coating, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-RR-P-62; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for materials and finish.

U. S. Gov., Federal Specification RR-P-76; 1935. Pans; Dust. Covers two types—(I) hood pattern; in two classes—(A) welded handle, and (B) covered wire handle; and (II) open pattern; in three classes—(A) welded handle, (B) covered wire handle, and (C) one piece. Gives requirements for material, workmanship, construction, finish, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-P-571; 1939. Amendment 1; 1944. Pots; Marking, Ink. Covers one type, grade, and size. Gives requirements for material and workmanship, tinned plate, coating, body, cover, handle, illustration, dimensions, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1918. Boilers; Tin, Nested, for No. 1 Field Range.

U. S. Gov., Marine Corps Specification, 1921. Boilers; Tin, Nested, for No. 2 Field Range.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-53; 1939. Dipper; Tin.

References.—Standard sizes of tin ware, *see* 612.20; liquid and dry measures of tin, *see* 919.1; metal kits and pails, *see* 951.61, 951.64; tin coatings, test of, *see* 600.3; illuminating torch for railways, tin, *see* 997.1; tin cans, *see* 959.1.

681.42 Tin Coatings

References.—Test of tin coatings, *see* 600.3; roofing tin, terneplate, *see* 604.31.

681.43 Tin Alloys

References.—Bronzes, *see* 643, 646, 647, 692.3; phosphor tin, *see* 682; babbitt metal, *see* 692.1; solder, *see* 693.2.

681.49 Miscellaneous Tin Manufactures

Collapsible Tube Mfrs. Assn. Lead, Tin-Coated and Tin-Lead Alloy Tube Data, 1941. Gives inside and outside dimensions and weights, for seven numbers, minimum wall thickness, and metal and moulded plastic cap data.

Collapsible Tube Mfrs. Assn. Tin Tube Data, 1941. Gives inside and outside dimensions and weights, for seven numbers, minimum wall thickness, and tin and moulded plastic cap data.

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

U. S. Gov., Federal Specification RR-W-456; 1935. Wireware; Bake-Shop and Kitchen. Covers eight types—(I) broilers, (II) chains, pot-cleaning, (III) cleaners, pot, chain, (IV) drainers, (V) potato mashers, (VI) skimmers, (VII) egg whips, and (VIII) pastry whips. Gives requirements for material, workmanship, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 64G3b; 1943. Graters.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-96; 1941. Tin; Pulverized.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-18A; 1937. Foil; Tin.

References.—Cans made from tin plate, *see* 959.1.

682. PHOSPHOR TIN

American Society for Testing Materials, B 51-42; 1942. Phosphor Tin. For material in ingot form; chemical composition, sampling and uniformity requirements, and marking. Endorsed by the American Foundrymen's Assn.

U. S. Gov., Federal Specification QQ-T-351; 1932. Tin; Phosphor. Covers one grade. Gives requirements for material and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—General requirements for metals, *see* 600.1.

683. ZINC

683.0 GENERAL ITEMS

American Society for Metals. Metals Handbook, 1939 edition. Constitution of Zinc Alloys and Properties of Zinc and Its Alloys. Covers constitution of zinc-aluminum, zinc-cadmium, zinc-iron, zinc-lead, zinc-magnesium, zinc-nickel, zinc-silver, and zinc-tin alloys; zinc-rich portion of the zinc-copper and zinc-magnesium constitution diagram; physical constants of zinc; and properties of wrought zinc and zinc alloys.

American Society for Metals. Metals Handbook, 1939 edition. Micrography of Zinc and Technology of Zinc and Its Alloys. Covers polishing of zinc for metallographic examination, etching of zinc and zinc alloys for metallographic examination, and zinc die castings.

American Society for Testing Materials, D 521-40; 1940. Methods of Chemical Analysis of Zinc Dust (Metallic Zinc Powder). Covers procedure for analysis of form known commercially as zinc dust for use as pigment in paint; mixing for sample, determination of moisture and other volatile matter, reagents for total zinc, and metallic zinc and zinc oxide by difference.

American Society for Testing Materials, E 26-43 T; 1943. Tentative Method of Quantitative Spectrochemical Analysis of Zinc for Lead, Iron, and Cadmium. This method may be applied to any grade of zinc provided the lead, iron, and cadmium contents are less than 0.1 percent. Covers preparation of sample, preparation of electrode, preliminary and final estimation, and testing for compliance with specification.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Zinc. Covers definition, constants, occurrence, grades, specifications, uses, and forms available; also I—definition, constants, physical properties, and uses for zinc alloy (die casting); and II—definition, uses, constants, purity, forms available, and grades for zinc powder.

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Zinc Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers zinc alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular 66; 1917. Standard Samples for Thermometric Fixed Points. Description of preparation of pure samples of zinc; their chemical analyses, freezing point, and degree of purity; their use for the standardization of thermocouples, pyrometers, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Zinc Ore (Tri-State Concentrate), Sample 113. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Zinc, Sample 43e. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis, for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Zinc Spelter, Samples 108, 109, and 110. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

683.1 ZINC OR SPELTER INGOT METALS

American Society for Testing Materials, B 6-37; 1937. American Assn. of State Highway Officials, M 120-37. American Standards Assn., H 24.1-1943. Endorsed by American Foundrymen's Assn. Slab Zinc (Spelter). Covers six grades made from ore or other material by a process of distillation or by electrolysis. Gives marking, quality, composition, physical appearance, sampling, claims, plant treatment, and investigation and settlement of claims.

U. S. Gov., Army Air Forces Specification 11328; 1941. Ingots; Zinc Base Alloy (for Forming Dies).

U. S. Gov., Federal Specification QQ-Z-351a; 1940. Zinc; Slab (Spelter). Covers six grades—(A-1) special high grade, (A) high grade, (B) intermediate, (C) brass special, (D) selected, and (E) prime western. Gives chemical composition; methods of sampling, inspection, and tests; and requirements for packing and marking.

References.—Methods of test, general requirements for metals, *see* 600.1, 683.0.

683.2 ZINC SHEETS AND PLATES

American Society for Testing Materials, B 69-39; 1939. American Assn. of State Highway Officials, M 113-39. American Standards Assn., H 25.1-1943. Rolled Zinc. Covers three types—(I) coils or sheets cut from strip rolled zinc, (II) pack rolled zinc, and (III) zinc plates. Gives requirements for permissible variations in dimensions, coils, bend and curvature, packing, marking, sidewise bend or curvature, gaging, and appendix.

American Zinc Institute. Specification for Hot-Dipped Zinc-Coated Ferrous Sheets Bearing the "Zinc Institute Seal of Quality" Trade-Mark, 1931. For use on sheets of No. 28 and heavier galvanized sheet gages.

Covers gage weights, weight of coating, testing, record of tests, inspection, marking, and forming.

U. S. Gov., Federal Specification QQ-Z-301a; 1938. Zinc; Plates, Sheets, and Strips. Covers three types—(I) coils or sheets cut from strip (ribbon) rolled zinc, (II) pack rolled zinc, and (III) zinc plates, such as boiler and hull plates produced by any rolling method. Gives requirements for material, workmanship, bending, and permissible variations; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 47Z6b; 1939. Zinc; Plates, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 683.0; zinc coated iron and steel sheets, *see* 604.32.

683.3 ZINC STRIPS

U. S. Gov., Federal Specification QQ-Z-301a; 1938. Zinc; Plates, Sheets, and Strips. Covers three types—(I) coils or sheets cut from strip (ribbon) rolled zinc, (II) pack rolled zinc, and (III) zinc plates, such as boiler and hull plates produced by any rolling method. Gives requirements for material, workmanship, bending, and permissible variations; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 47Z6b; 1939. Zinc; Plates, Sheets, and Strips.

References.—Methods of testing, general requirements for metals, *see* 600.1, 663.0; standard thicknesses, weights, and tolerances, *see* 683.2.

683.4 ZINC MANUFACTURES

683.41 Zinc-Base Die Castings

American Society for Testing Materials, B 86-43; 1943. Zinc-Base Alloy Die Castings. Covers three alloy compositions. Gives requirements for manufacture, base metal, chemical composition, sampling, physical properties, stability, expansion test, test specimens, number of tests, soundness, optional tests, finish, and rejection.

American Society for Testing Materials, B 186-42 T; 1942. Tentative Specifications for Special Quality Zinc-Base Alloy Die Castings. Covers two alloys where added assurance will be gained against breakdown in service which might entail danger to life or failure to achieve important objectives. Manufacture, base metal, chemical composition, chemical analysis, physical properties, tests, stabilization treatment, production control, workmanship, marking, and records.

American Society for Testing Materials, E 27- 43 T; 1943. Tentative Method of Quantitative Spectrochemical Analysis of Zinc-Alloy Die Castings for Minor Constitutents and Impurities. This method refers particularly to the analysis of zinc-base die-casting Alloy Nos. XXI and XXIII, covered by the Tentative Specifications for Zinc-Base Alloy Die Castings B 86-34 T of the American Society for Testing Materials. The method includes the determination of copper in Alloy No. XXIII and of magnesium, iron, lead, tin, and cadmium in Alloys Nos. XXI and XXIII. The determination of nickel in an alloy differing from Alloy No. XXIII by the presence of nickel as a minor constituent is also included. An arc spectrum is used, employing graphite electrodes, one of which is treated with a solution of the sample to be analyzed. Quantitative estimations are made by the comparison of the spectrum of the sample with the spectra of standard samples of known composition.

Society of Automotive Engineers, Aeronautical Material Specification 4803; 1944. Zinc Alloy Die Castings. Gives requirements for composition, quality, stability, reports, identification, and rejections. Similar specifications: S.A.E. 903; A.S.T.M. B86-41T; and Alloy No. XXIII.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Zinc Alloys Die Casting, revised 1939. Gives specification Nos. 903, 921, and 925. Covers composition in percentage, general information, and typical physical and mechanical properties.

U. S. Gov., Navy Dept. Specification 46Z 2c; 1944. Zinc-Base Alloy; Die-Castings.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-93-2A; 1942. Casting; Die, Zinc-Aluminum-Magnesium Alloy.

References.—Methods of test, general requirements for metals, *see* 600.1, 683.0.

683.42 Gravity Battery Zincs

References.—Gravity battery zincs, *see* 712.5.

683.49 Miscellaneous Zinc Manufactures

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-A-686a; 1944. Anodes; Zinc.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-440A; 1941. Zinc Dust.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-228A; 1942. Anode; Zinc.

References.—Nails, spikes, tacks, and staples of zinc, *see* 608.1.

683.5 ZINC ALLOYS

U. S. Gov., Army Air Forces. Specification 10302; 1939. Rod; Zinc Alloy, Welding (for Aeronautical Use).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C395; 1931. Zinc and Its Alloys. Summarizes from technical literature the physical and mechanical properties of zinc, together with results obtained at the National Bureau of Standards; effects of structural conditions of the metal resulting from impurities and from such factors as mechanical working, recrystallization upon measured physical properties; discusses corrosion resistance of zinc, and the die-casting alloys and the properties which determine their usefulness industrially.

References.—Zinc base die casting alloys, *see* 683.41; copper-tin-zinc alloys, *see* 643, 646, 647; brass, *see* 644, 645; nickel-copper-zinc alloys, *see* 655; brazing solder, brass, *see* 693.2.

683.6 ZINC COMPOUNDS AND SALTS

References.—Chemical compounds of zinc, *see* 839.38.

684. ZINC COATINGS (GALVANIZING)

References.—Zinc coated sheets, *see* 604.32; zinc coatings and tests, *see* 600.3.

684.0 GENERAL ITEMS

690-699 MISCELLANEOUS ORES, METALS, ALLOYS, AND METAL MANUFACTURES

690. GENERAL ITEMS

691. SILVER

691.0 GENERAL ITEMS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C412; 1936. Silver; Its properties and Industrial Uses. Information is given concerning variation in physical properties by mechanical working and heat treatment; discussed chemical properties with respect to resistance to corrosion; and describes the bactericidal uses of silver, its employment in chemical equipment, and also its application in electrical switching devices.

691.1 SILVER METAL AND ALLOYS

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Metallic Silver. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Silver. Covers definition and properties, constants, solubility, derivation, purity, forms available, uses, and marketing.

U. S. Gov., Navy Dept. Specification 57S63; 1944. Sutures; Silver-Wire.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2724; 1939. Silver; Pure.

References.—Silver solder, *see* 693.3; definition of sterling, *see* 691.0; dental alloys, *see* 915.12.

691.2 SILVERWARE

American Hospital Assn., 64-10. Nickel-Silver Tableware.

American Hospital Assn., 64-13. Silver-Plated Tableware. Based on U. S. Gov., Federal Specification RR-T-51a for Silver-Plated Tableware.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R54-26; 1926. Sterling Silver Flatware. This recommendation establishes a schedule of stock items in sterling silver flatware patterns covering various items listed as staples, fancy dozens, carving sets, baby sets, child's sets, and fancy single pieces. Sponsored by Sterling Silversmiths Guild of America.

U. S. Gov., Federal Specification RR-T-51a; 1934. Tableware; Silver-Plated. Covers a grade equal to that required for high-class hotel and restaurant service. Gives requirements for chemical composition of metal, weights of silver used on commonly used articles of flatware; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-RR-T-51a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specification (RR-T-56) Tableware; Steel (Chromium, Nickel, Silver, and Tin) Plated.

U. S. Gov., Federal Specification RR-T-56; 1941. Amendment 1; 1944. Tableware; Steel (Chromium, Nickel, Silver, and Tin) Plated. Covers three types—(I) knives, table (straight-blade and grille); (II) forks (dessert, flat-handle); and (III) spoons (tea and table, medium). Gives requirements for material, workmanship, construction, finish, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 63-MC-1; 1941. Tableware; Silver-Plated, Flatware and Holloware. Type I, flatware; type II, holloware; grade A, extra heavy hotel plate; grade B, triple plate; class I, with overlay; and class II, without overlay. Gives requirements for materials, workmanship, finish, marking, tolerances, design, silverplate, sampling, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 63-MC-7; 1941. Tableware; Flatware, Steel Base, Silver-Plated (Officers'). Type I, knives (table); type II, forks; type III, spoons; type IV, spreaders; seven classes; and two grades. Gives requirements for material, workmanship, identification, finish, plating, sampling, inspection, and methods of test.

References.—Definition of sterling, *see* 691.0.

691.3 SILVER COMPOUNDS AND SALTS

References.—Chemical compounds of silver, *see* 839.37.

692. BABBITT AND OTHER BEARING METALS

692.0 GENERAL ITEMS

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations, Aircraft Metals. Tin Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers tin alloys, babbitts, solders, and brazing alloys.

Society of Automotive Engineers, Inc. Report on Engine Bearings; Replacement Technique for Installation or Fitting. Submitted to Vehicle Maintenance Section, Office of Defense Transportation, 1943. Covers section I—types of bearings and materials of engine bearing construction; and II—operational guide for engine bearing replacement.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-36a; 1944. Preservation and Packing of Bearings and Bearing Parts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP512; 1933. White-Metal Bearing Alloys—Mechanical Properties at Different Temperatures and Service Tests. Gives results of a study made of the wear resistance and other mechanical properties of 11 white-metal bearing alloys.

692.1 BABBITT METALS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Movable Railway Bridges. Includes requirements for composition of babbitt metal.

American Society for Testing Materials, B 23-26; 1926. White Metal Bearing Alloys (known commercially as "Babbitt Metal"). Covers 12 typical babbitt metals based on tin content, quality, size, chemical composition, permissible variations in composition, samples for analysis, and physical properties. Endorsed by the American Foundrymen's Assn. A.S.T.M. Emergency Alternate Provision EA-B 23b; 1944, affected section 4, Chemical Composition; table I, Chemical Requirements; and appendix, Physical Properties of Alternate Alloys.

American Society for Testing Materials, B 67-44; 1944. Assn. of American Railroads AAR. Specification M501-43. Car and Tender Journal Bearings; Lined. For use on locomotive tenders, passenger, and freight equipment cars. Gives requirements for manufacture, chemical composition, analysis, examination of fracture, permissible variations in dimensions, workmanship and finish, marking, inspection, and rejection. Endorsed by the American Foundrymen's Assn.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Babbitt. Covers definition, characteristics, constants, grades, uses, forms available, and marketing customs.

Society of Automotive Engineers. Aeronautical Material Specification 4800; 1940. Bearings; Babbitt. Gives requirements for form, composition, sampling, quality, reports, identification, corrosion, approval, and rejections. Similar to U. S. Gov. Federal Specification QQ-M-161, Grade I; A.S.T.M. Specification B23-26, Alloy Grade 1; and Society of Automotive Engineers Specification 10.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE Standard Bearing and Bushing Alloys, revised 1944. Covers main and connecting rod bearings including babbitt metals, silver bearing alloys, cadmium bearing alloys, and copper-lead bearing alloys; wrist pin and miscellaneous bushing alloys; and sintered metal powder bearings.

U. S. Gov., Army Air Forces. Specification 10285-A-3; 1943. Wire; Metal, Spray Gun.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Bearing Metal, Tin Base, Sample 54b. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Specification QQ-M-161; 1932. Metal; Antifriction, Castings and Ingots. Covers seven grades in the form of ingots for remelting or castings. Gives requirements for material, workmanship, and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and shipping. Emergency Alternate Federal Specification E-QQ-M-161; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) deleted grades 1, 2, 3, 4, and 5 and gives requirements for grades 6, 7, 8, 9, 10, 11, and 12.

U. S. Gov., Navy Dept. Specification 46M2e; 1933. Metal; Antifriction, Ingots and Castings.

References.—Methods of testing, general requirements for metals, *see* 600.1, 692.0; bronze backings of lined bearings, *see* 692.2.

692.2 BEARING METALS, OTHER THAN BABBITT

American Society for Testing Materials, B 22-44T; 1944. American Assn. of State Highway Officials, M107. Tentative Specifications for Bronze Castings for Turntables and Movable Bridges and for Bearing and Expansion Plates of Fixed Bridges. Cover four classes of bronze castings for turntables and movable bridges and two classes of cast-bronze plates used in bridges and other structures for fixed and expansion bearings where motion is slow and intermittent. Give requirements for manufacture, chemical composition, chemical analysis, methods of chemical analysis, physical properties, hardness, test specimens, number of tests, finish, inspection, and rejection. Endorsed by American Foundrymen's Assn. A.S.T.M. Emergency Alternate Provision EA-B22b; 1944, affected table I, Chemical Requirements, table II, Physical Requirements and Figures.

American Society for Testing Materials, B 30-44T; 1944. Tentative Specifications for Copper-Base Alloys in Ingot Forms for Sand Castings. Covers 25 copper-base alloys, with A.S.T.M. classifications, numerical, and commercial designations. Includes aluminum-bronze. Gives requirements for manufacture, chemical analysis, marking, inspection, rejection and retesting, claims, and settlement of claims. Endorsed by American Foundrymen's Assn.

American Society for Testing Materials, B 66-44; 1944. Assn. of American Railways' AAR. Specification M 503-42. Bronze Castings in the Rough for Locomotive Wearing Parts. Includes hard, medium, soft, and phosphor bronze castings, and ordinary uses of each. Gives requirements for chemical composition, chemical analysis, sample for chemical analysis, method of analysis, examination of fracture, number of tests, permissible variations in dimensions, workmanship and finish, marking, inspection and rejection. Endorsed by the American Foundrymen's Assn.

American Society for Testing Materials, B 144-44T; 1944. Tentative Specifications for High-Leaded Tin-Bronze Sand Castings. Cover five alloys and are intended for use for conventional bearings and bushings in the cast state. Gives basis of purchase, manufacture, chemical composition and analysis, methods of chemical analysis, tensile properties, pressure and fracture tests, test specimens, number of tests, methods of testing, workmanship and finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-B 144b; 1944, affected section 9, Test Specimens, and adds figures 3 and 4.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-503-43 changed AAR. Specification M-503-42, Bearings, Bronze for Locomotives, section I, Chemical Properties and Tests, paragraph 3, Chemical Composition.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-503-42; 1942. Bearings; Bronze, for Locomotives. Covers bronze castings in the rough for locomotive wearing parts. Gives requirements for chemical and physical properties and tests, permissible variation, finish, marking, inspection, rejection, and rehearing.

Society of Automotive Engineers. Aeronautical Material Specification 4805; 1941. Sintered Bearings, Bushings. Gives requirements for composition, condition, quality, lubrication, precaution, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4820; 1940. Bearings; Copper Lead, Steel Back (Copper-Lead, 73-27). Gives requirements for form (steel back, lined on one or both sides with bearing metal), composition, quality, sampling, reports, identification, corrosion, approval, and rejections. Similar to Society of Automotive Engineers Specification 48.

Society of Automotive Engineers. Aeronautical Material Specification 4822; 1940. Bearings; Copper Lead, Steel Back (Copper-Lead-Tin, 71-25-3). Gives requirements for form (steel back, lined on one or both sides with bearing metal), composition, quality, sampling, reports, identification, corrosion, approval, and rejections. Similar to Society of Automotive Engineers Specification 481.

Society of Automotive Engineers. Aeronautical Material Specification 4825; 1941. Bearings; Copper-Lead-Tin, Steel Back (Copper-Lead-Tin, 74-16-10). Gives requirements for form (steel back, lined on one or both sides with bearing metal), composition, sampling, quality, reports, identification, corrosion, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 4827; 1942. Bushings; Copper Lead Tin, Steel Backed Castings. Shall consist of a steel back, lined on one or both sides with a bearing metal of the composition specified. Gives requirements for composition, sampling, quality, reports, identification, corrosion, approval, and rejection. Similar specification: S.A.E. 792.

Society of Automotive Engineers. Aeronautical Material Specification 4840; 1940. Bearings; Copper-Lead-Tin Castings (Copper-Lead-Tin, 70-25-5). Gives requirements for composition, condition, quality, reports, identification, precautions, shipments, approval, and rejection. Similar to U. S. Gov., Navy Dept., Specification 46B22, Grade V; and A.S.T.M. Specification B66-35, Soft Bronze Alloy.

Society of Automotive Engineers. Aeronautical Material Specification 4842; 1941. Bushings; Copper-Lead-Tin Castings (Copper-Lead-Tin, 79-10-10) Gives requirements for composition, hardness, quality, precautions, reports, identification, shipments, approval, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE Standard Bearing and Bushing Alloys, revised 1944. Covers main and connecting rod bearings including babbitt metals, silver bearing alloys, cadmium bearing alloys, and copper-lead bearing alloys; wrist pin and miscellaneous bushing alloys; and sintered metal powder bearings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Bearing Metal, Lead Base, Sample 53a. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Bearing Metal, Phosphor-Bronze, Sample 63a. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Navy Dept. Specification 46B22e; 1944. Bronze, Bearing; Castings.

U. S. Gov., Treasury Dept., Procurement Div., No.472; 1941. Bronze, Bearing; Castings, Leaded. Shall be made from best grades of virgin metals, or from best grades of virgin metals and scrap of known composition and cleanliness. Gives requirements for repairing of defects, dimensions, chemical composition, and physical properties; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing, general requirements for metals, *see* 600.1, 646.0; brass and bronze ingot metals for bearings, *see* 644.11.

692.3 METAL BEARINGS

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 72, 73, 74, 75, 76, and 77. Bushing. NAS 72; 1942, Clamp-Up, Steel, Chrome Plated. NAS 73; 1942, Clamp-Up, Steel, Cadmium Plated. NAS 74; 1942, Clamp-Up, Bronze. NAS 75; 1942, Plain, Press-Fit, Steel, Cadmium Plated. NAS 76; 1942, Plain, Press-Fit, Bronze. NAS 77; 1944, Flanged, Press-Fit, Steel. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 181; 1944. Bearings; Plain Spherical (Interchangeable). Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

American Society for Testing Materials, B 67-44; 1944. Assn. of American Railroads, AAR Specification M501-43. Car and Tender Journal Bearings; Lined. For use on locomotive tenders, passenger, and freight equipment cars. Gives requirements for manufacture, chemical composition, analysis, examination of fracture, permissible variations in dimensions, workmanship and finish, marking, inspection, and rejection. Endorsed by the American Foundrymen's Assn.

American Transit Assn. Standard Journal Boxes and Contained Parts, E2-34; 1934. Standard designs and dimensions for journal boxes, bearings and wedges, and dust guards for seven sizes of bearings.

American Transit Assn. Standard Design of Gauges for Journal Bearings and Wedges, E12-31; 1931. Gives detailed drawings and dimensions of gauges for journal bearings and wedges.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Bearings; Journal, Lined. Emergency Specification E-M-501-43; 1944, changed A.A.R. Specification M-501-41, section I, Chemical Properties and Tests, and section V, Marking.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Bearings; Journal, Lined. Specification M-501-41; 1941. Covers journal bearings for use on locomotive tenders, passenger and freight cars. Gives manufacture, chemical and physical properties and tests, permissible variations, finish, marking, inspection, rejection and rehearing, with dimensional drawing.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Emergency Specification E-M-502-42, changed A.A.R. Specification M-502-41, Bearings, Journal, Relined, Scope, Dimensions (Relined Journal Bearings), Crown Thickness (Relined Bearings), Inspection, and Marking.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification M-502-41; 1941. Bearings; Journal, Relined. Determination of condition, wear limits, reboring operation, tinning, lining, and inspection, with dimensional diagram.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Journal Bearings. Standard, corrected 1942. Dimensional drawing with size variations for A, B, C, D, E, and F journals, tolerance and marking. Emergency Specification, 1942, changed requirements.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Journal Bearing Gages, Journals A to F, Inclusive. Standard, revised 1941. Detailed dimensional drawings of size of journal. Emergency Specification issued in 1942.

Society of Automotive Engineers. Aeronautical Material Specification 4800; 1940. Bearings; Babbitt. Gives requirements for form, composition, sampling, quality, reports, identification, corrosion, approval, and rejections. Similar to U. S. Gov. Federal Specification QQ-M-161, Grade I; A.S.T.M. Specification B23-26, Alloy Grade 1; and Society of Automotive Engineers Specification 10-

Society of Automotive Engineers. Aeronautical Material Specification 4815A; 1944. Bearings; Silver, Steel Back. Shall consist of silver electroplated on a steel back. Gives requirements for composition, procedure, hardness, quality, reports, identification, corrosion, approval, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 4817; 1942. Bearings; Cast Silver, Steel Back. Shall consist of silver cast on steel back. Gives requirements for composition, procedure, hardness, quality, reports, identification, corrosion, approval, and rejection.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE Standard Brass and Bronze Castings, revised 1944. Gives specification No.66 and No.660—Bronze Bearings. Covers composition in percentage, general information, physical properties, and recommended uses.

U. S. Gov., Army Air Forces. Specification 25534; 1943. Bearings; Plain, Aircraft, General Specification for.

U. S. Gov., Army Air Forces. Specification 25536 (1); 1944. Bearings; Bellcrank.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-4-2; 1944. Bearings; Anti-Friction Air-Frame.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-7; 1942. Bearings; Copper-Tin Sintered (Oil Impregnated).

References.—Bearing metals, *see* 692.1, 692.2; journal boxes, *see* 611.22; ball and roller bearings, *see* 766.2.

693. SOLDERS AND BRAZING

693.0 GENERAL ITEMS

American Society for Metals. Metals Handbook, 1939 Edition. Nonferrous Section General. Covers hot plastic working of nonferrous metals, soldering (soft solders), and brazing and related joining methods.

American Welding Society. Filing Classification of Welding, Brazing, Soldering, and Cutting Processes, Materials and Applications, 1936. Gives complete details for a standard filing or classification system covering the entire welding field and allied processes and may be used as either a filing system or an indexing system.

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Tin Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers tin alloys, babbitts, solders, and brazing alloys.

U. S. Gov., Army Air Forces. Specification 20018; 1939. Brazing Process; Furnace, Copper, for Aircraft Parts.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-20003-B; 1939. Brazing Aircraft Parts.

693.1 SOLDER (TIN-LEAD BASE)

American Society for Testing Materials, B32-40T; 1940. Tentative Specifications for Soft Solder Metal.

Covers two grades of tin-lead, and tin-lead-antimony alloy. Gives requirements for quality, chemical composition, permissible variations in chemical composition, sampling for chemical analysis, preparation of sample for analysis, methods of chemical analysis, dimensions, marking, inspection, rejection, claims, and appendix. A.S.T.M. Emergency Alternate Provision EA-B32b; 1944, affected section 1, Scope; section 3, Chemical Composition; section 4, Permissible Variations in Chemical Composition; table I, Chemical Requirements; and table II, Properties of Soft Solder Metal.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-38; 1930. 40-60 and 45-55 Solder. Gives uses for each solder, chemical composition and variations, form and weights.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-20; 1926. Rosin Core Solder. Seamless tube filled with rosin flux, composition of 38 percent tin solder, in the form of a wire. Requirements as to minimum impurities, diameter of wire and rosin core, and sizes of 1 and 5 lb. spools.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Solder. Covers definition, properties, soldering fluxes, grades of solder, sizes, core solders, other solders, impurities, shipping regulations, and ordering instructions.

Society of Automotive Engineers. Aeronautical Material Specification 4750; 1940. Solder; Tin-Lead (50-50). Gives requirements for form (wire strip, bars, and ingots), composition, physical properties, quality, and rejections. Similar to U. S. Gov., Navy Dept., Specification 46 S 14, Grade A; U. S. Gov. Federal Specification QQ-S-571, Grade A; A.S.T.M. Specification B32-21, Grade No.1; and Society of Automotive Engineers Specification 1, Class A.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE Standard Solders, Revised 1944. Gives reference table of similar specifications for solders and a table of S.A.E. standard and emergency solders giving chemical composition and temperatures where materials are solid and liquid.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS58; 1940. Strength of Soft-Soldered Joints in Copper Tubing. An extended investigation was made of the strength, under tensile loading, of sleeve joints in copper tubing, with wrought-copper and cast-brass couplings, soldered with (50-50) tin-lead and (95-5) tin-antimony alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS83; 1942. Strength of Sleeve Joints in Copper Tubing Made With Various Lead-Base Solders. Solders of the following types were used—lead-silver, lead-tin-antimony, lead-cadmium, high lead-low tin, and high-purity lead. Tensile tests at room temperature (short-time tests) were made, together with long-time tests at temperatures ranging from 85° to 325° F.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Solder, 35 Sn-65 Pb, Sample 127. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Specification QQ-S-571a; 1942. Amendment 1; 1942. Solder; Tin-Lead. Covers seven grades—A, B, D, E, F, G, and H. Gives requirements for material, chemical composition and melting range, and fluxed-cored wire solder; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-QQ-S-571a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted one class of lead-tin-silver solder and one class of lead-silver solder, and gives requirements for same.

U. S. Gov., Navy Dept. Specification 46S14b; 1944. Solder; Tin-Lead.

U. S. Gov., Navy Dept. Specification 46S20a; 1943. Solder; Tin-Lead, Wire, Flux-Cored.

U. S. Gov., Navy Dept. Specification 46S38a; 1945. Solder; Tin-Antimony.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-98; 1931. Solder; Low Melting Point.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-332D; 1937. Solder M-31; Rosin Core.

References.—Methods of testing, general requirements for metals, *see* 600.1, 692.0.

693.2 SOLDERS, COPPER-ZINC BASE

American Society for Testing Materials, B 64-43; 1943. Brazing Solder. Covers two grades of granular brazing solder in three classifications. Gives requirements for manufacture, chemical composition, chemical analysis, sampling, round-grain solder, long-grain solder, lump solder, packing, impurities, marking, inspection, and rejection.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. SAE Standard Brass and Bronze Castings, 1944. Gives specification No. 45—Brazing Solder. Covers composition in percentage and general information and use.

U. S. Gov., Federal Specification QQ-S-551; 1932. Amendment 1; 1942. Solder; Brazing. Covers four compositions—A, B, C, and D; one grade each. Gives requirements for material, workmanship, form (granulated, ingots, bars, or wire), and chemical composition; methods of inspection and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 46S15a; 1934. Solder; Brazing.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11; brass welding rod, *see* 645.11.

693.3 SILVER SOLDER

American Society for Testing Materials, B 73-29; 1929. Silver Solders. For eight grades of silver-copper-zinc alloys in wire, strip, sheet, or granular form, for brazing purposes; requirements for manufacture, chemical composition, and methods of sampling.

Society of Automotive Engineers. Aeronautical Material Specification 4755; 1940. Solder; Lead-Silver (95-5). Gives requirements for form (wire, strip, bars, and ingots), composition, quality, physical properties, and rejections. Similar to

U. S. Gov., War Dept., Specification 57-99-1; and U. S. Gov. Navy Aeronautical Specification M-254.

Society of Automotive Engineers. Aeronautical Material Specification No.4770; 1940. Brazing Alloy; Silver (50 Percent Silver, Copper, Zinc, Cadmium). For joining nonferrous and ferrous materials, including austenitic steels. Gives requirements for form (wire, strip, pig, or granular); composition, physical properties, condition, quality, size and tolerance, precautions, packaging, and rejections. Similar to U. S. Gov., Navy Dept., Specification 47 S 13, Grade IV; and U. S. Gov. Federal Specification QQ-S-561, Class 4.

U. S. Gov., Federal Specification QQ-S-561d; 1944. Solder; Silver. Covers seven classes—0, 1, 2, 3, 4, 5, and 6. Furnished in strips, wire, pigs, grain, shot, or chips. Gives requirements for materials, workmanship, chemical composition, form, strip, and wire; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 46S42; 1941. Solder; Lead-Silver.

U. S. Gov., Navy Dept. Specification 47S13c; 1936. Solder; Silver.

U. S. Gov., U. S. Army, Army Air Forces. Specification 57-99-1; 1933. Solder; Lead-Silver.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2869; 1939. Solder; Silver, Dental.

References.—Methods of testing, general requirements for metals, *see* 600.1, 644.11.

693.4 SOLDERS FOR ALUMINUM

693.5 GOLD SOLDER

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2748A; 1941. Solder; Gold.

695. MAGNESIUM AND MAGNESIUM ALLOYS

References.—Methods of testing, general requirements for metals, *see* 600.1; other light alloys of aluminum, *see* 631.11, 631.41; magnesia pipe coverings, *see* 707.43; chemical compounds of magnesium, *see* 839.39.

695.0 GENERAL ITEMS

American Society for Metals. Metals Handbook, 1939 Edition. Micrography of Magnesium and Technology of Magnesium and Its Alloys. Covers polishing of magnesium alloys for metallographic examination, etching of magnesium alloys for metallographic examination, magnesium alloy die castings, hot and cold working of magnesium, machaning of magnesium, riveting of magnesium, and protection of magnesium against corrosion.

695.1 MAGNESIUM METAL AND ALLOYS

American Society for Metals. Metals Handbook, 1939 Edition. Constitution of Magnesium Alloys and Properties of Magnesium and Its Alloys. Covers constitution of magnesium-aluminum, magnesium-copper, magnesium-manganese, and magnesium-zinc alloys; physical constants of magnesium; and physical properties of magnesium-aluminum and magnesium casting alloys.

American Society for Testing Materials, B92-41; 1941. Magnesium Ingot and Stick for Remelting. Covers 99.8 percent commercial form. Manufacture, chemical composition, workmanship and finish, claims, sampling for umpire and analysis, and settlement of claims.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Mangesium and Magnesium Alloys. Covers definition, constants, derivation, solubility, purity and forms available, uses, supply, packing, and definition; physical properties, forms available, and marketing for magnesium alloy.

Society of Automotive Engineers, Inc. Aeronautical Information Report 8; 1944. U. S. and British Commonwealth of Nations Aircraft Metals. Magnesium Alloys. Gives table showing specifications used in the U. S. and specifications for similar metals used in the United Kingdom, Australia, and Canada for use in the selection of interchangeable and substitute materials for the repair and maintenance of aircraft; and a table showing chemical composition and mechanical properties of these aircraft metals. Covers bars, rods, shapes, forgings, sheet, tubing, and castings.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. Notes on Magnesium Alloys, revised 1944. The outstanding characteristic of magnesium alloys is their lightness. Covers castings, sand castings, die castings, permanent mold castings, wrought alloys, extruded alloys, rolled alloys, and forgings together with tables of dimensions.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. Standard Magnesium Alloy Specifications, revised 1944. Gives table showing compositions of S.A.E. magnesium alloys and gives specifications including general information and physical properties for sand castings, die castings, permanent mold castings, wrought alloys, extrusion alloys, and forging alloys.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C346; 1927. Light Metals and Alloys—Aluminum and Magnesium. Gives detailed information on the physical and mechanical properties of aluminum and magnesium and of their light alloys; and the variation in properties caused by changing the composition of the alloy, by the presence of impurities, by changes in conditions of manufacturing operations, and by heat treatment. Discusses the metallography, corrosion resistance, and methods of protection against corrosion, the theory of heat treatment, and the application of the alloys to industry.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-21-1C; 1944. Magnesium Powder.

695.2 MAGNESIUM ALLOY PLATES, SHEETS, AND STRIPS

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 194; 1944. Magnesium Alloy—Standard Thicknesses for Sheet and Plate. Gives table showing various thicknesses and standard sheet sizes. Thickness sizes based on American Standards Assn. preferred number series B32.1-1941. Developed by National Aircraft Standard Committee.

American Society for Testing Materials, B90-44T; 1944. Tentative Specifications for Magnesium-Base Alloy Sheet. Cover four designated commercial types of alloy sheet having a specific gravity under 1.8. Manufacture, chemical composition, tensile properties, test specimens, tolerances, workmanship, and explanatory notes.

Society of Automotive Engineers. Aeronautical Material Specification 4370; 1940. Magnesium Alloy Sheet (Annealed). Gives requirements for composition, condition, physical properties, quality, tolerances, reports, and rejections. Similar to U. S. Gov., War Dept., Specification 11317, Grade A; U. S. Gov., Navy Dept., Specification M-111d, Alloy 11, Condition A; A.S.T.M. Specification B90-38T, Alloy 11; and Society of Automotive Engineers Specification 51.

Society of Automotive Engineers. Aeronautical Material Specification 4380; 1941. Magnesium Alloy Sheet, Aluminum Zinc (Annealed). Gives requirements for composition, condition, quality, tolerance, reports, corrosion, rejections, and identification. Similar specifications: Army 11317, Grade II, Condition A; Navy M-111, Alloy 8, Condition A; Alloys C-57S and J-1.

Society of Automotive Engineers. Aeronautical Material Specification 4381; 1941. Magnesium Alloy Sheet, Aluminum Zinc (Hard). Gives requirements for composition, condition, quality, tolerance, reports, corrosion, rejections, and identification. Similar specifications: Army 11317, Grade II, Condition H; Navy M-111, Alloy 8, Condition H; Alloys C-57S and J-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-28; 1944. Magnesium Alloy, 6.5 Aluminum, 1.0 Zinc; Sheet and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-29; 1944. Magnesium Alloy, 3.0 Aluminum, 1.0 Zinc; Sheet and Strip.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-30, 1944. Magnesium Alloy, 1.5 Manganese; Sheet and Strip.

U. S. Gov., Navy Dept. Specification 47M2a; 1942. Magnesium-Base Alloy; Sheet.

U. S. Gov., U. S. Army, Ordance Dept. Specification 57-157; 1944. Magnesium-Base Alloy; Plate and Sheet.

695.3 MAGNESIUM ALLOY TUBING

U. S. Gov., Army Air Forces. Specification 11334; 1942. Tubing; Magnesium Alloy (3.0 Aluminum, 3.0 Zinc) Round, Seamless.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-71; 1944. Tubing; Magnesium Alloy (6.5 Aluminum, 1.0 Zinc), Round, Extruded.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-72; 1944. Tubing; Magnesium Alloy (3.0 Aluminum, 1.0 Zinc), Round, Extruded.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-73; 1944. Tubing; Magnesium Alloy (1.5 Manganese) Round, Extruded.

U. S. Gov., Navy Dept. Specification 44T35; 1941 Tubing; Magnesium-Base Alloy.

U. S. Gov., U.S.Army, Ordnance Dept. Specification 57-193; 1944. Magnesium-Base Alloy; Tubing.

695.4 MAGNESIUM ALLOY BARS, RODS, AND SHAPES

American Society for Testing Materials, B 107-44T; 1944. Tentative Specifications for Magnesium-Base Alloy Bars, Rods, and Shapes. Covers commercial extruded shapes in five types of alloys. Manufacture, chemical composition, sampling, tensile properties, test specimens, number of tests, methods of testing, permissible variations in dimensions, workmanship and finish, inspection, rejection, and explanatory notes re types of alloys.

Society of Automotive Engineers. Aeronautical Material Specification 4350A; 1941. Wrought Magnesium Alloy Bars and Forgings—Aluminum Zinc. Gives requirements for composition, condition, tensile strength, yield strength, elongation, Brinell, quality, identification, corrosion, and rejections. Similar specifications: Air Corps 11320, Grade 1; Navy M-314, Alloy 8; S.A.E. 520; Alloys J 1; Alloy C 57 S.

U. S. Gov., Army Air Forces. Specification 11322; 1939. Rod; Welding, Magnesium Alloy (for Aeronautical Use).

U. S. Gov., Army-Navy Aeronautical Specification AN-M-24; 1944. Magnesium Alloy, 6.5 Aluminum, 1.0 Zinc; Extruded Bar, Rod, and Shapes.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-25; 1944. Magnesium Alloy, 8.5 Aluminum, 0.5 Zinc; Extruded Bar, Rod, and Shapes.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-26; 1944. Magnesium Alloy, 1.5 Manganese; Extruded Bar. Rod, and Shapes.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-27; 1944. Magnesium Alloy, 3.0 Aluminum, 1.0 Zinc; Extruded Bar, Rod, and Shapes.

695.5 MAGNESIUM ALLOY CASTINGS

American Society for Testing Materials, B80-44T; 1944. Tentative Specifications for Magnesium-Base Alloy Sand Castings. For castings of commercial alloy having specific gravity under 1.9; six types of alloys. Manufacture, heat treatment, chemical composition, sampling for chemical analysis, tensile properties, test specimens, number of tests, methods of testing, workmanship and finish, inspection, rejection, and explanatory notes. Endorsed by American Foundrymen's Assn.

American Society for Testing Materials, B 93-44T; 1944. Tentative Specifications for Magnesium-Base Alloys in Ingot Form for Sand Castings and Die Castings. Covers commercial alloys in ingot form with specific gravity under 1.9, for eight designated types of alloys. Gives manufacture, chemical composition, sampling for chemical analysis, and rejection.

American Society for Testing Materials, B 94-44T; 1944. Tentative Specifications for Magnesium-Base Alloy Die Castings. For two alloys having specific gravity about 1.8; requirements for manufacture, chemical composition, sampling, and workmanship. Includes explanatory notes on physical properties.

American Society for Testing Materials, ES-40; 1944. Emergency Specifications for Special Quality, Magnesium-Base Alloy Die Castings. Gives scope, manufacture, detail drawings, chemical composition, chemical analysis, sample castings, production control, marking, and records.

Society of Automotive Engineers. Aeronautical Material Specification 4420B; 1942. Magnesium Alloy Castings (Sand), 6 Al, 3 Zn (As Cast). Gives requirements for composition, casting, hardness, test bars and analytical samples, quality, precautions, reports, identification, corrosion, approval, and rejections. Similar specifications: Army-Navy Aeronautical AN-QQ-M-56, Composition A, Condition AC, S.A.E. 50, Condition As Cast; A.S.T.M. B80-41T; Alloy No. 4, Condition As Cast.

Society of Automotive Engineers. Aeronautical Material Specification 4422C; 1944. Magnesium Alloy Castings (Sand) 6 Al, 3 Zn (Solution). Gives requirements for composition, casting, heat treatment, test bars and analytical samples, quality, precautions, reports, identification, corrosion, approval, and rejections. Similar Specification: Army-Navy Aeronautical AN-QQ-M-56, Composition A, Condition HT; S.A.E. 50, Condition Heat Treated; A.S.T.M. B80-41T, Alloy No. 4, Condition Heat Treated.

Society of Automotive Engineers. Aeronautical Material Specification 4424C; 1944. Magnesium Alloy Castings (Sand) 6 Al, 3 Zn (Solution-Precipitation). Gives requirements for composition, casting, heat treatment, test bars and analytical samples, quality, precautions, reports, identification, corrosion, approval, and rejections. Similar Specification: Army-Navy Aeronautical AN-QQ-M-56, Composition A, Condition, H.T.A.; S.A.E. 50; Condition, Heat Treated and Aged; A.S.T.M. B80-41T, Alloy No. 4; Condition, Heat Treated and Aged.

Society of Automotive Engineers. Aeronautical Material Specification 4434B; 1944. Magnesium Alloy Castings (Sand) 9 Al, 2 Zn (Solution-Precipitation). Gives requirements for composition, casting, heat treatment, test bars and analytical samples, quality precautions, reports, identification, corrosion, approval, and rejections. Similar specification: Army-Navy Aeronautical AN-QQ-M-56; Composition C, Condition H.T.A.; S.A.E. 500; Condition Heat Treated and Aged; A.S.T.M. B80-41T; Alloy No. 17, Condition, Heat Treated and Aged.

Society of Automotive Engineers. Aeronautical Material Specification No. 4484; 1944. Magnesium Alloy Castings (Permanent Mold) 9 Al, 2 Zn (Solution-Precipitation). Gives requirements for composition, casting, heat treatment, test bars, quality, precautions, reports, identification, corrosion, approval, and rejections. Similar Specification, Army Air Forces 11349, Condition H.T.A.

Society of Automotive Engineers. Aeronautical Material Specification 4490A; 1942. Magnesium Alloy Die Casting. Gives requirements for composition, quality, reports, identification, corrosion, approval, and rejections. Similar specifications: Air Forces 11319; Navy 46M11; Navy Aeronautical M-369; S.A.E. 501; A.S.T.M. - B94-40T, Alloy 13.

U. S. Gov., Army Air Forces. Specification 11348-1; 1944. Magnesium Alloy; 10.0 AL, Permanent Mold Castings.

U. S. Gov., Army Air Forces. Specification 11349-1; 1944. Magnesium Alloy Castings; Permanent Mold, 9.0 Aluminum, 2.0 Zinc.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-16; 1943. Magnesium Alloy; Die Castings.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-M-56-1; 1943. Magnesium Alloy; Sand Castings.

U. S. Gov., Navy Dept. Specification 46M11; 1941. Magnesium-Base Alloy; Die Castings.

U. S. Gov., U.S. Army, Ordnance Dept. Specification 57-74-1E; 1943. Magnesium-Base Alloy; Sand Castings.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-74-2; 1943. Magnesium-Base Alloy; Permanent Mold Castings.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-74-3; 1943. Magnesium-Base Alloy; Die Castings.

695.6 MAGNESIUM ALLOY FORGINGS

American Society for Testing Materials, B91-44T; 1944. Tentative Specifications for Magnesium-Base Alloy Forgings. Covers fully worked commercial forgings having a specific gravity under 1.9, for five types of alloy. Manufacture, chemical composition, tensile properties, test specimens, workmanship, and explanatory notes.

Society of Automotive Engineers. Aeronautical Material Specification 4350A; 1941. Wrought Magnesium Alloy Bars and Forgings—Aluminum Zinc. Gives requirements for composition, condition, tensile strength, yield strength, elongation, Brinell, quality, identification, corrosion, and rejections. Similar specifications: Air Corps 11320, Grade 1; Navy M-314, Alloy 8; S.A.E. 520; Alloys J 1; Alloy C 57 S.

Society of Automotive Engineers. Aeronautical Material Specification No. 4360; 1940. Wrought Magnesium Alloy Forgings. Gives requirements for composition, condition, physical properties, quality, reports, corrosion, and rejections. Similar to U. S. Gov., Air Corps, Specification 11321; U. S. Gov., Navy Dept., Specification M-126, Grade 9; A.S.T.M. specification B107-38T, Alloy 9.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-20; 1944. Magnesium Alloy, 6.5 Aluminum, 1.0 Zinc; Forgings.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-21; 1944. Magnesium Alloy, 8.5 Aluminum, 0.5 Zinc; Forgings.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-22; 1944. Magnesium Alloy, 1.5 Manganese; Forgings.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-23; 1944. Magnesium Alloy, 3.5 Aluminum, 5.0 Tin; Forgings.

U. S. Gov., Navy Dept. Specification 46M13; 1941. Magnesium-Base Alloy; Forgings.

696. ORES, METALS, AND ALLOYS NOT ELSEWHERE CLASSIFIED

American Society for Metals. Metals Handbook, 1939 edition. Properties of Lithium. Covers properties of lithium and its alloys.

American Standards Assn., Z 37.6-1942. Prepared by the U. S. Public Health Service. Allowable Concentration of Manganese (American War Standard). To prescribe the permissible concentration of manganese dust and fumes in the atmosphere of work places for the protection of the health of all workers. Gives properties of manganese, permissible concentration, sampling procedure, and analytical methods.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Beryllium. Covers definition, constants, solubility, properties, occurrence, grades, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Chromium; Metallurgical. Covers definition, constants, solubility, derivation, uses, grades, forms and shipping, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Indium. Covers definition, constants, solubility, derivation, uses, grades and forms, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Lithium. Covers definition, constants, solubility, uses, derivation, forms and grades, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Manganese. Covers definition, constants, derivation, uses, forms and grades, production and imports of ore, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Molybdenum. Covers definition, constants, occurrence, forms available, containers, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Tantalum. Covers definition, constants, derivation, mechanical properties, forms, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Titanium; Metallurgical. Covers definition, constants, structure and work-ability, derivation, uses, grades and forms, and containers.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Tungsten and Ferrotungsten. Covers definition, constants, derivation, uses, impurities, and substitutes.

U. S. Gov., Army Air Forces. Specification 10300-1; 1937. Rods; Welding, Chromium-Cobalt-Tungsten Composition, for Hard-Facing Metal Parts.

U. S. Gov., Navy Dept. Specification 46R3c; 1945. Rods; Welding, Tungsten-Carbide.

U. S. Gov., Navy Dept. Specification 46R5b; 1938. Rods; Welding, Chromium-Cobalt Composition.

References.—Methods of testing, general requirements for metals, *see* 600.1; ferro-tungsten, *see* 621.25.

697. FLUX FOR SOLDERING, WELDING, AND BRAZING

697.1 SOLDERING FLUX

U. S. Gov., Federal Specification O-F-506; 1943. Flux; Soldering, Paste. Covers one type and one grade and shall not cause burns or irritation on contact with the skin. Gives requirements for consistency, corrosion, volatile matter, and performance; sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 51F1c; 1945. Flux; Soldering, Paste.

U. S. Gov., U. S. Army, Army Air Forces. Specification 2-89-1935. Paste; Soldering, Non-Corrosive.

697.2 WELDING FLUX

U. S. Gov., Army Air Forces. Specification 11313; 1939. Flux; Gas Welding, (for) Aluminum and Aluminum Alloys (Aircraft Use).

U. S. Gov., Army Air Forces. Specification 11314; 1939. Flux; Gas Welding. (for) Corrosion and Heat Resistant Steel (Aircraft Use).

U. S. Gov., Army Air Forces. Specification 11315; 1939. Flux; Gas Welding (for) Nickel-Chromium Iron Alloy (Aircraft Use).

U. S. Gov., Army Air Forces. Specification 11323-A; 1945. Flux; Gas Welding, for Magnesium Alloys.

U. S. Gov., Navy Dept. Specification 51F3a; 1937. Flux; Gas-Welding, for Corrosion- and Heat-Resisting Steel (Aircraft Use).

U. S. Gov., Navy Dept. Specification 51F6; 1940. Flux; Welding, for Aluminum and Aluminum Alloy.

U. S. Gov., Navy Dept. Specification 51F7; 1940. Flux; Gas-Welding, for Nickel-Chromium-Iron Alloy (Aircraft Use).

U. S. Gov., Navy Dept. Specification 51F8; 1940. Fluxes; Welding.

697.3 BRAZING FLUX

Society of Automotive Engineers. Aeronautical Material Specification No.3410; 1940. Flux (Brazing, Silver). This specification covers silver brazing at temperatures from 1,200° to 1,600° F., and silver brazing corrosion-resisting steels (18 chromium, 8 nickel) at 1,200° F. It is a paste containing not more than 30 percent water by weight. Gives requirements as to physical properties, quality, packaging, and rejections. Similar to U. S. Gov., War Dept., Specification 11316; and Navy Dept. Specification 51F4.

U. S. Gov., Army Air Forces. Specification 11316-A; 1940. Flux; Brazing, Silver Alloy.

U. S. Gov., Navy Dept. Specification 51F4a; 1940. Flux; Brazing (Silver).

700-799 MACHINERY AND VEHICLES

700-709 POWER GENERATING EQUIPMENT

(Except Electrical)

700. GENERAL ITEMS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Rules for the Construction and Classification of Machinery. Include conditions of classification, boilers and other pressure containers, steam engines, internal combustion engines, electrical equipment, pumps and piping systems, propellers, refrigerating machinery and insulation of cargo spaces; and rules for the inspection and testing of materials for machinery, boilers, and piping.

American Society of Mechanical Engineers. Letter Symbols for Heat and Thermodynamics Including Heat Flow, 1943. American Standards Assn., Z10.4-1943. Sponsor organizations, American Assn. for the Advancement of Science; American Institute of Electrical Engrs.; American Society of Civil Engrs.; and Society for the Promotion of Engineering Education. Covers general letter symbols, letter symbols primarily for heat and thermodynamics, letter symbols for heat flow, and letter symbols for radiation.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Definitions and Values, 1931. Outlines the units to be employed in reporting the results of tests made in accordance with the various power test codes. Covers table 1 (fundamental units and constants), table 2 (units of output), table 3 (units of performance), and general notes on data and computations of test codes.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. General Instructions, 1929. Supplements specific instructions to be found in each code. Covers scope of the codes, the object, the preparations, instruments and testing apparatus, miscellaneous instructions, the starting conditions, the operating conditions, the records, working up the data, and the report.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 1—General Considerations, 1935. The instruments and apparatus here considered are those used for measuring physical and chemical quantities in connection with tests of power equipment.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 8—Measurement of Indicated Horsepower, 1941. This section treats the direct measurement of the indicated power of piston engines and machines with the aid of engine indicators. Several types of indicators are described and illustrated, along with recommendations for installation of the indicator on an engine and for carrying out the indicating tests. There are also chapters dealing with testing lubrication, accuracy at pressure measurement and evaluation of results.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 9—Heat of Combustion, 1943. Treats of calorimetric apparatus for solid, liquid, and gaseous fuels.

American Society of Mechanical Engineers. Power Test Codes, Auxiliary Section. Part 20—Smoke Density Determinations, 1936. Describes methods of measurements, instruments used, and smoke scale. Includes samples of standard smoke charts.

American Society for Testing Materials, C 108-44 T; 1944. Tentative Symbols for Heat Transmission. Gives special practices relating to heat flow terms including terms ending in "ivity," "ance," and "ion"; transmission; and conduction. Also heat flow symbols including area, density, specific heat, temperature, time, weight, flow rate, thermal conductivity, thermal resistivity, thermal resistance, thermal conductance, heat transfer, radiant flux, and thermal diffusivity.

American Standards Assn., B48.1-1933. American Standard Practice for Inch-Millimeter Conversion for Industrial Use.

Assn. of American Railroads, Operations and Maintenance Department, Operating-Transportation Division, Safety Section. Safety Rules Governing Maintenance of Way and Structures Employes, 1942. Includes general provisions; eye protection; motor, hand, trailer, and push cars (track cars), and motor vehicles; protection against train and engine hazards; handling material; derricks, cranes, and roadway material; tools or tackle; working around electrical circuits or equipment; working on poles; ladders, scaffolds, and trestles; working at elevated positions, manhole. well, trench, sewer, turntable pit or other excavation; cutting and welding equipment; preparing and using molten metals or materials; and handling gasoline, other flammables, and explosives. Also includes provisions for signal, telegraph, and telephone, and electrical workers on power circuits and on overhead lines.

Assn. of American Railroads, Operations and Maintenance Department, Operating-Transportation Div., Safety Section. Safety Rules Governing Train, Engine, and other Transportation Employes. Station Employes and Dining Car Service Employes, 1942. Includes general provisions on or about tracks, structures, platforms, and equipment; handling material and freight; and using tools or appliances and working around machinery; provisions for train engine and other transportation employes (except station and dining car employes)—coupling or uncoupling engines and cars and work incident thereto; operating engines, hand brakes, and switches; getting on or off engines or cars; on engines, cars, or trains; handling freight, baggage, express, mail, etc.; and other train and engine service works; provisions for station employes—trucking; gases, acids, explosives, etc.; tools and equipment; elevators, power cranes, hoists, or derricks; getting on or off equipment; self-propelled trucks or tractors; and miscellaneous; and provisions for dining car employes—dining car, kitchen and pantry; handling and stowing material and supplies; trucking material and supplies; and miscellaneous.

Assn. of American Railroads. Purchases and Stores Div. Manual, 1939. Recommended rules and practices governing use of stock book, requisitions and receiving material, transferring material between stores, handling material manufactured in shops, material released and reclaimed including scrap, working stocks, rails and ties, locomotive fuel, ice, stationery, inventory, safety practice, fire prevention, standard organization and practices, uniform methods of purchase of equipment and large material contracts, stock control, carrying cost of material and supplies investment, and handling of containers.

Assn. of American Railroads. Purchases and Stores Division. Standard Material Classification, 1940. For materials used by railroads under main numbered headings with detail lists of materials under each heading and the unit in which purchased.

National Conference on Uniform Traffic Accident Statistics, Committee on Definitions. Manual of Definitions of Motor Vehicle Accidents, 1942. Includes primary definitions and guiding examples and interpretations for motor-vehicle accident, motor vehicle, motor-vehicle traffic accident, traffic way, motor-vehicle accident death, motor-vehicle traffic accident death, place of accident, and property damage; and classifications of types of motor vevehicle traffic accidents and causes of death. Endorsed by U. S. Public Health Service, U. S. Bureau of Census, Division of Statistics Standards, U. S. Bureau of the Budget, and U.S. Public Roads Administration.

National Safety Council, joint sponsor with National Council on Compensation Insurance, and International Assn. of Industrial Accident Boards and Commissions. American Standards Assn., Z16.2-1941. Recommended Practice for Compiling Industrial Accident Causes. Part I, Selection of Accident Factors, defines the various classes of disabilities, the time charges to be assigned to the disabilities, definitions of frequency and severity rates, and general rules for the compilation of rate statistics; Part II, Detailed Classification of Accident Factors, presented in five sections—(1) agency and agency part, (2) the unsafe mechanical or physical condition, (3) the accident type, (4) the unsafe act, and (5) the unsafe personal factor.

U. S. Gov., Dept. of Labor, Division of Labor Standards. Special Bulletin 7; 1942. Standards for Industrial Safeguards. Runways; Elevated. Covers means of access and railings.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000°F. Includes specifications for two grades (A and B) of stay-bolt steel—process, chemical composition, bending properties, test specimens, number of tests, permissible variation in diameter, finish, and marking.

References.—Temperature measurements, *see* 919.80; density determination of solids, liquids, and gases, *see* 503.0; liquid fuels, *see* 503.0; coal and coke, *see* 501; tolerances, allowances, and gages for metal fits, *see* 615.82; heat transmission measurements, *see* 792.0.

701. STEAM ENGINES AND LOCOMOTIVES

701.1 STEAM ENGINES

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Steam Reciprocating Engines. Include requirements for construction and installation, drawings and data to be submitted, material, general construction, bedplate, cylinders, shafting, crankshaft, webs, tube shafts, tailshafts, tailshaft liners, hollow shafts, coupling bolts, trial, and spare parts and equipment.

American Society of Mechanical Engineers. Power Test Code. Reciprocating Steam-Driven Displacement Pumps, 1927. For determining the performance of the pump and engine, including reheaters, heaters, and jacket pumps, circulating pumps, condensate pumps, and vacuum pumps, which are concerned in their operation; with auxiliary sections on general considerations, pressure measurement, temperature measurement, electrical measurements, determination of quality of steam, measurement of time, speed measurements, linear measurements, and leakage measurement.

American Society of Mechanical Engineers. Power Test Code. Reciprocating Steam Engines, 1935. Recommends standard methods of determining the performance of an engine, including steam jacket if any; with auxiliary sections covering general considerations, pressure measurement, temperature measurement, electrical measurements, determination of quality of steam, measurement of time, speed measurements, linear measurements, measurement of surface areas, and leakage measurement.

Technical Assn. of the Pulp and Paper Industry. Standard Power Plant Report, E 201 p-44; 1944. Lists data to be obtained, and form of report, for steam, steam-electric power, hydro-electric power, and purchased power paper mills.

References.—Donkey engines, *see* 703.1; other ship engineering specifications, *see* 725.42; steel forgings, shafts, *see* 611.51, 611.52; general requirements on power test codes, *see* 700; gaskets, rod packing, *see* 707.1, 707.2.

701.2 STEAM TURBINES

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Steam Turbines and Gears. Include requirements for construction and installation, drawings, material, general construction, astern power, definition of speed, governor control, casings, shafting, turbine rotors, blades, tests, and spare parts and equipment.

American Society of Mechanical Engineers. Power Test Code. Steam Turbines, 1941. Appendix, 1943. Provides for the testing and for the computation and tabulation of the results, for condensing, regenerative and non-condensing or back-pressure turbines. Includes object and scope; description and definition of terms applicable to all turbines, emergency governor, reheating, regenerative, and extraction and mixed-pressure turbines; guiding principles embracing agreements to be reached, tolerances, preliminaries to tests, test conditions, instruments, and corrections; instruments and method of measurement; computation of results; and report of tests. Appendix is intended to facilitate the working up of test reports.

National Electrical Manufacturers Assn. Turbine-Generator Recommended Practices, 41-66; 1941. Covers direct connected sets and 25 cycle and direct-current geared sets in types and sizes in current use. Includes requirements for turbine units; synchronous generators for steam turbine drive; and direct-current generators for steam turbine drive.

National Electrical Manufacturers Assn. Recommended Standards for Single-Stage and Multi-Stage Mechanical Drive Steam Turbines, 43-88; 1943. Provides practical information concerning construction, performance, and manufacture of single-stage and multi-stage mechanical drive steam turbines. Covers nomenclature, basis of rating, initial steam pressure and temperature standards, turbine load capacities, overspeed protective devices, relief valves for turbine discharge connections, speed governor, turbines governed by external devices, finish and painting, and standard features and accessories.

References—Steel forgings, shafts, *see* 611.51, 611.52; cast iron, cast steel, *see* 611.11, 611.41; general requirements on power test codes, *see* 700; speed governors, *see* 795.

701.3 LOCOMOTIVES

American Railway Engineering Assn., Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1940. Steam Locomotives. Gives general principles, locomotive classification, table of horsepower capacities, typical characteristics of steam locomotives, and typical design data pertaining to steam locomotives.

American Society of Mechanical Engineers. Boiler Construction Code. Boilers of Locomotives, 1943. Recommendations here are given for materials, working pressures, thickness of plates and tubes, joint efficiency, braced and stayed surfaces, riveting, safety valves, fittings, hydrostatic tests, fusion welding, stamping, etc.

American Society of Mechanical Engineers. Power Test Code. Steam Locomotives, 1941. These rules are divided into two parts—a code for laboratory tests to determine the coal and steam consumption per unit of power when the locomotive is operated under fixed conditions, and a code for road tests to develop similar information under the conditions of road service. Consideration is given to measurements involved, instruments and apparatus required, preparations, operating conditions, duration of test, calculation of results and method of calculating individual items. Also included are approved forms for reporting data and results; with auxiliary sections on general considerations, pressure measurements, temperature measurements, determination of quality of steam, measurement of time, speed measurement, linear measurement, measurement of surface areas, smoke density determinations, and leakage measurement.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1943. Counterbalancing of Locomotives. Diagrams and formulae for calculating weight of counterbalance, for the reduction of rail blow and smoother operation. Example gives illustration of principles involved.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Efficiency Tests of Locomotives. Method of Conducting. Gives detailed method of conducting laboratory and road tests, for determining steam and fuel consumption per unit of power, testing apparatus and method of attachment, test data sheets and computation forms, for calculating horse power and boiler efficiency, etc.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Inspection and Testing of Locomotive Boilers. Design and construction responsibility, factor of safety, rules for inspection, interior, and exterior inspection, and testing, staybolts, steam gages, safety valves, water gages, injectors, flue plugs, washing boilers, and reports.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Rules for Fuel Economy on Locomotives. For saving of coal fuel, instructions to prepare fire adding coal and water, firing methods (with ten illustrations of firebox), combustion of mixed fuels, cleaning fires, etc. Also for use of oil fuel, condition of boiler, draft, scale, and suggestions to engineer and fireman.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Rules and Instructions for Inspecting and Testing of Steam Locomotives and Tenders. Inspection periods, care of ash pans, brakes, cabs, signals, sanders, draft gear, driving gear, lights, running gear, tenders, throttle, and reversing gear. Includes table of minimum thickness for tires on standard and narrow-gage lomotives, inspection reports, and accident reports.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Tractive Power for Mallet Locomotives. Formulae for tractive power, simple and compound, at 90 and 50 percent cut-off, for four cylinder locomotives. Also includes three cylinder simple locomotives, and locomotive booster.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. U. S. Safety Appliances for all Classes of Cars and Locomotives. Includes the safety-appliance acts, requirements on number, dimensions, location, and manner of application of hand brakes, running boards, steps, ladders, hand holds, uncoupling levers, and safety railings, with dimensional drawings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H5; 1923. American Standards Assn., B13-1924. American Logging and Sawmill Safety Code. For steam locomotives for logging railroads, requirements on minimum allowed factor of safety, number, general location, and protection of water glasses, gauge (try) cocks, and gauges, capacity and type of safety valves, design and dimensions of footboards, and handrails, equipment requisite in lamps, sand boxes, spark arresters, and ash pan.

U. S. Gov., Interstate Commerce Commission, Bureau of Locomotive Inspection. Laws, Rules, and Instructions for Inspection and Testing of Steam Locomotives and Tenders and Their Appurtenances, 1929. Also interpretations, rulings, and explanations on questions raised regarding above laws, rules, and instructions, 1921. Requirements, mandatory by law, for new locomotives and for locomotives in service, as regards permissible factor of safety for boiler, allowable stress on boiler stays and braces, design strength of material and rivets, interior and exterior inspection, hydrostatic pressure test, stay bolt testing, location, siphon connection, and testing of steam gauges, number, capacity, and test of safety valves, number and location of water glass and gauge cocks, provision of glass shields, method of support and height of ash pan, testing of air brake compressors and reservoirs, maximum piston travel for brakes, windows and curtains for cabs, cab apron, provision of mechanically operated fire door, safety chains for draw gear, fit in main and side rod bearings, headlight illumination intensity, cab lighting, minimum diameter of axles for various loads, permissible play in wheel bearings, clearance of pilot, gauge of wheel and their pressing on axles, gangway of tender and relative deck height, etc., permitted wear limits and defects appearing in service.

U. S. Gov., Interstate Commerce Commission, Bureau of Locomotive Inspection. Laws, Rules, and Instructions for Inspection and Testing of Steam Locomotives and Tenders and Their Appurtenances, 1929. Safety Appliance Standards for Locomotives. Requirements, mandatory by law, regarding number, dimensions, location, and application of sill steps, handholds, uncoupling levers, running boards, and handrails, provision of automatic couplers and of hand-brakes, standard height of draw-bars.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-30; 1937. Locomotive; Steam, Type 280.

References.—Electric locomotives, *see* 721.1; boiler plates, *see* 604.11; copper plates for locomotive fireboxes, *see* 641.21; staybolt and engine bolt iron bars, *see* 603.1; copper bars for locomotive staybolts, *see* 641.12; boiler tubes, *see* 703.2; structural steel for locomotives, *see* 605.13; locomotive cylinders, *see* 702.1; locomotive frames, *see* 702.2; miscellaneous locomotive parts, *see* 702.9; miscellaneous boiler accessories, *see* 703.9; general requirements for power test codes, *see* 700; classification of material, *see* 700; valve stem packing, *see* 707.2.

702. ACCESSORIES AND PARTS FOR STEAM ENGINES AND LOCOMOTIVES

702.0 GENERAL ITEMS

American Society of Mechanical Engineers. Power Test Code. Evaporating Apparatus, 1941. Rules for the testing of single or multiple-effect evaporators to determine—(1) adaptability of apparatus, (2) best method of operation, (3) capacity or efficiency or both of new installation preparatory to acceptance. Recommendations include measurements, instruments, and apparatus, precautions to be observed, operating conditions, duration of test, method of recording data obtained, and calculation of result. An approved form for reporting results of test is included; with auxiliary sections on general considerations, pressure measurement, temperature measurement, and measurement of time.

702.1 CYLINDERS FOR STEAM LOCOMOTIVES

References.—Gray cast iron, *see* 611.11; methods of testing cast iron, *see* 600.1.

702.2 FRAMES FOR STEAM ENGINES AND LOCOMOTIVES

American Society for Testing Materials, A 87-44; 1944. Carbon-Steel and Alloy-Steel Castings for Railroads. Four grades intended for locomotive and car equipment. Gives requirements for heat treatment, temperature control, chemical composition, ladle analysis, check analysis, tensile properties, alternate tests to destruction, magnetic particle testing, test specimens, number of tests, retests, permissible variations in weight, workmanship, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A87; 1942. Section 3 (d) full annealing, and section 10 (a) magnetic particle testing.

References.—Cast steel, *see* 611.41; methods of testing metal, *see* 600.1.

702.3 BOILERS AND FIREBOXES FOR STEAM ENGINES AND LOCOMOTIVES

702.9 MISCELLANEOUS PARTS FOR STEAM ENGINES AND LOCOMOTIVES

American Society of Mechanical Engineers. Power Test Code. Compressors and Exhausters, 1935. This code provides standard directions for conducting and reporting tests on centrifugal compressors and exhausters. The information is presented as follows: (1) Object and scope, (2) enumeration and description of terms, (3) guiding principles, (4) instruments and testing apparatus required and measurement methods, (5) computation of results, (6) form for reporting data and results of tests. In addition, the method of measuring flow with nozzles is explained in detail, and formulas are given for flow measuring nozzles. Diagrams are included to show the nozzle shape applying to all arrangement.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Dry Pipes and Outside Steam Pipes. Recommended Practice. Revised, 1943. For locomotives, recommended diameters, and thickness of ten sizes of pipe.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brackets and Other Means of Support for Air Pumps, Water Pumps, Power Reverse Gears Feedwater Heaters, Etc., on

Locomotives. Requirements for design brackets built up from steel bars or made of cast steel, location of boiler braces, reinforcement to prevent vibration, with outline diagrams.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Crossheads and Guides for Locomotives. Covers use of alligator type cross head and guide, with formulae and drawings. Includes methods of lubrication, taking up wear, and materials.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Crosshead or Wrist Pins. Recommendations for design of crosshead pins, in several sizes, with dimensional drawings, detailing oil or grease lubrication, maximum bearing pressure, and material to be of forged steel, medium grade, A.A.R. specification.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Design of Frame Pedestal Toes for Both Built-up Frames and Engine Beds. Diagrams for two styles of pedestal toes, with ratios members to width of frame.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Front and Back cylinder Heads for Locomotives. Design factors and drawings for cylinders up to 32 in. diameter and boiler pressure up to 300 lb. Material to be cast steel, A.A.R. specification, grade B.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Knuckle Joints for Locomotive Side Rods. Recommended designs and details for rod ends and pins of forged steel. Gives maximum bearing pressure, and requires material to meet A.A.R. specification.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Injectors; Dimensions for Flange and Screw Couplings for. Dimensional drawing of various sizes of iron and copper pipe, detailing thread, shoulder, etc. Includes forged steel bolted flanges, coupling nuts, and sleeves, etc.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Locomotive Rods for Heavy Power. Factors of design, and drawings for two forms of main and side rod.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Locomotive Sanding System. Gives sanding arrangements for steam, Diesel, and electric locomotives.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Main and Other Crank Pins for Locomotives. Requirements for designs using A.A.R. specifications for material, with detailed diagrams, and formulas for design of pins.

Assn. Of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Pistons and Heads for Locomotives. Design recommendations and dimensional drawing of piston head of the conical type, for several sizes of cylinder.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Piston Rod and Key Taper in Crosshead. Dimensional drawing of taper for rod and key, with alternate.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Typical Methods of Lubricating Main and Side Rods. For locomotives, lubrication of back end of main rod, end of side rod, crank pin, and cross head pin. Dimensional drawings.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Universal Joints for Operating Rods of Cab Valves, Injectors, Etc. Recommends use of three styles only for locomotive cab valves. Gives dimensional drawings, of jaws and combinations for screw, extension rod, and square head patterns.

U. S. Gov., Navy Dept. Specification, 60S1a; 1944. Sirens, Steam, Revolving Cylinder Type, 150 to 600 Pounds per Square Inch W.S.P. (Shipboard Use).

References.—Locomotives, *see* 701.3; cast iron, cast steel, *see* 611.11, 611.41; cast-iron wheels, cast-steel wheels, *see* 611.18, 611.49; forged-steel wheels and tires, *see* 611.53; journal boxes, bearings, *see* 611.22, 692.3; brake beams, brake shoes, *see* 611.42 and 611.43; couplers and cast-steel parts, *see* 611.44, 611.49; axles, *see* 611.52, 611.51; valves, safety valves, *see* 607.6; hose, *see* 202; lubricator fittings, *see* 794; boiler accessories, *see* 703.9; locomotive headlights, *see* 716.2; power piping, *see* 607.0.

703. BOILERS, FURNACES, EVAPORATORS, CONDENSERS

703.0 GENERAL ITEMS

American Boiler Manufacturers Assn. and Affiliated Industries. Determination of Design Pressure for Boilers.

American Boiler Manufacturers Assn. and Affiliated Industries. Performance Forms for Steam Generating Equipment, 1937. Contains standard provisions adopted by this association for predicted or guaranteed performance of boilers and appurtences, radiation loss chart, and specifies conditions for tests.

American Boiler Manufacturers Assn. and Affiliated Industries. Standard Contract Forms. Prepared for the information of specification writers for steam generating equipment and covers general conditions and performance.

American Boiler Manufacturers Assn. and Affiliated Industries. Standard Guaranteed Performance Forms. Covers guaranteed performance on boilers with or without water walls, superheaters, air heaters, economizers, stokers, stoker fans, pulverizers, pulverized coal burners, and steam generating units.

American Petroleum Institute, Production Div. Code 2; 1942. Code of Recommended Field Practice on Care and Use of Oil Field Boilers. Applies to horizontal return tubular and locomotive or firebox type boilers. Includes requirements for installation of boiler settings, stacks, pipe and fittings, steam piping, blow-off piping, feed water piping, burners, and fuel piping; and rules for care and operation of boilers in oil fields.

American Petroleum Institute, Production Div. Standard 2; 1942. Specification for Oil Field Boilers

(Locomotive Type). Covers detailed information relative to the installation of oil field boilers, including settings for both firebox type and return tubular type, with paragraphs devoted to stacks, fittings, and piping, illustrated with four full-page diagrams. Also contains sections on the care and operation of boilers, including firing and cutting in, cutting out and shutting down, cleaning out boiler, and repairs.

American Society of Mechanical Engineers. Boiler Construction Code. Low-Pressure Heating Boiler Code, 1943. Rules apply to steel and cast iron boilers used exclusively for low-pressure steam heating, hot water heating, and hot water supply. Recommendations cover materials, thickness of plates and tubes, joint efficiency, braced and stayed surfaces, supports, setting and installation, fittings, safety valves, stamping, hydrostatic tests, and welding.

American Society of Mechanical Engineers. Boiler Construction Code. Material Specifications, 1943. For the important materials used in the construction of boiler and pressure vessels. Recommends chemical composition, outlines the requirements for tensile properties, test specimens, finish, marking, inspection, annealing, heat treatment, etc. Covers boiler steel plates and rivets, steel and iron castings, steel tubes, steel bolting materials, pipe and flanges, wrought iron, and nonferrous metals.

American Society of Mechanical Engineers. Boiler Construction Code. Miniature Boiler Code, 1943. Boilers for which these rules have been formulated do not exceed 16 in. inside diameter of shell, 42 in. over-all length of outside to outside of heads at center, 20 sq.ft. water heat surface, and 100 lb. per sq.in. maximum allowable working pressure. Code provides complete construction details.

American Society of Mechanical Engineers. Boiler Construction Code. Power Boiler Code Including Rules for Inspection, 1943. These rules apply to the boiler proper and piping connections up to and including the valves as required by the code, also to superheaters, reheaters, economizers, and other pressure parts connected directly to the boiler without intervening valves. Recommendations are provided for the materials, thicknesses of plates, joint efficiency, ligament efficiency, domes and manholes, dished and flat heads, braced and stayed surfaces, stays and stay tubes, combustion chambers, headers, riveting, caulking, nozzle openings, safety valves, gages, fittings, piping, setting, inspection, and stamping.

American Society of Mechanical Engineers. Boiler Construction Code. Suggested Rules for Care of Power Boilers, 1943. A set of practical rules for performing the ordinary duties of operating and maintaining steam boilers and appliances, such as handling boilers in and out of service, inspection, preventing causes of boiler failure, and treatment and control of boiler feedwater.

American Society of Mechanical Engineers. Power Test Code. Atmospheric Water-Cooling Equipment, 1930. Applies only to equipment used for cooling of the comparatively large amounts of water required for power or industrial purposes; with auxiliary sections covering general considerations, pressure measurement, temperature measurement, measurement of time, and humid-measurements.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 11—Determination of Quality of Steam, 1940. Describes and illustrates the following types of steam calorimeters: Throttling or internal superheating, separating, universal, external superheating, and electric. Sampling nozzles are discussed, and specific instructions given for their design and location.

American Society of Mechanical Engineers. Power Test Code. Evaporating Apparatus, 1941. These rules for the testing of single- or multiple-effect evaporators enable one to determine—(1) adaptability of apparatus, (2) best method of operation, (3) capacity or efficiency or both of new installation preparatory to acceptance. Recommendations include measurements, instruments and apparatus, precautions to be observed, operating conditions, duration of test, method of recording data obtained, and calculation of results. An approved form for reporting results of test is included.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 2—Pressure Measurement, chapters 1 and 6; 1941. Chapter 1 considers—types of barometers; methods of obtaining barometric pressure; range and accuracy of barometers; installation; barometric corrections and reductions; and calibration, etc. Chapter 6 presents information on standard conditions for mercury columns; standard barometric pressure for condensers, engines and turbines; barometric temperature; temperature corrections; temperature-correction formula; corrections for barometers and pressure gages for decrease of atmospheric pressure with elevation; gravity corrections; data for computing pressures above atmospheric; corrections for head and water columns; density of water and multipliers for water columns; formulas for pressure equivalents of velocity heads; computation of total pressure; formulas for pressure loss due to pipe friction, for friction loss in terms of velocity, and in terms of impact tube reading.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 10—Flue and Exhaust Gas Analyses, 1936. Recommends methods to be used in the analysis of flue gases from furnaces, and exhaust gases from internal-combustion engines.

American Society of Mechanical Engineers. Power Test Codes, Auxiliary Section. Part 21—Leakage Measurements, chapters 1 and 2; 1942. Chapter 1 describes the three recommended methods for determining condenser leakage (silver nitrate, direct-weight and resistance-equality). Specific instructions are given for condenser leakage tests; while the recommended procedure for making these tests is discussed in considerable detail. Chapter 2 shows how to determine the amount of (1) boiler and steam boiler pipe leakage, (2) leakage from feedwater pipe, and (3) leakage from condensate pipe.

American Society of Mechanical Engineers. Power Test Code. Dust Separating Apparatus, 1941. Designed to cover tests on all types of dust separating apparatus installed for operation in conjunction with solid-fuel fired furnaces. Directions are given for determining over-all efficiency; efficiency according to size of particles; pressure loss; dust concentration at the inlet and outlet of separator; combustible content of dust entering, leaving, and caught by separator; quantity of gas passing through the separator. Instruments to be used are described and methods of measurement given. This code also covers computation of results and provides a form for reporting test results, as well as a description and definition of terms used.

American Society of Mechanical Engineers. Power Test Code: Feedwater Heaters, 1927. Applies to open and closed boiler feedwater heaters. Covers object, instruments and apparatus, open heaters (installation, test, and calculation of results), closed heater (installation, test, and calculation of results), calculation of results, and records.

American Society of Mechanical Engineers. Power Test Code. Stationary Steam-Generating Units, 1936. Covers boiler, water walls, water floor, water screen, super-heaters, reheater, economizers, air heater, furnace and fuel burning equipment; auxiliary sections on general considerations, pressure measurement, temperature measurement, heat of combustion, flue and exhaust gas analyses, determination of quality of steam, measurement of time, smoke density determinations, and leakage measurements.

American Society of Mechanical Engineers. Power Test Code. Steam Condensing Apparatus, 1938. Provides rules for determining—(a) the absolute pressure the apparatus will maintain at the steam inlet nozzle when transferring heat rejected by the prime mover at a given rate in B. T. U. per hour with a given flow and temperature of circulating water, and a given tube cleanliness; (b) thermal transmittance of surface condensers for given operating conditions; (c) the amount of undercooling of the condensate; (d) the percentage of dissolved oxygen in the condensate; with auxiliary sections on general considerations, pressure measurement, temperature measurement, electrical measurements, measurement of time, determination of the viscosity of liquids, and leakage measurement.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 12.90; 1942. Pulverized Coal-Fired Boilers. Covers fire prevention methods for use of pulverized coal for firing boilers, for burning cement and lime in rotary kilns, and for ore roasting and metallurgical furnaces. Gives types and systems, pulverizing equipment, where explosions occur, safeguards, and operating instructions.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Boiler Connections. Form of thread for washout plugs, arch tube plugs, and all boiler connections. Includes radial crown bolts and stay bolts.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Rules for Determining Stresses in Locomotive Boilers. For new boilers, design factors for figuring net section, etc., longitudinal barrel seams and patches, gusset braces and flat surfaces, staybolts, etc.

Heat Exchange Institute, Condenser Section, 1939. This standard includes Part I, Surface Condenser Standards, covering nomenclature, definitions, condenser performance, materials of construction, atmospheric relief valve sizes, air pump capacity, and tubing characteristics; and Part II, Barometric and Low Level Jet Condenser Standards, covering nomenclature, types, design, definitions, performance, construction, atmospheric relief valves, air pump capacity, and installation. Also includes air-water vapor mixture data, pressure temperature conversion tables, and logarithms Base "E" applicable to both parts.

Heat Exchange Institute. Deaerator and Deaerating Heater Section, 1940. This standard covers nomenclature, definitions, types and standards of construction, rating standards and guarantees, accessories, and typical specification.

Heat Exchange Institute. Steam Jet Ejector and Vacuum Cooling Section, 1938. This standard includes Part 1, Steam Jet Ejectors, covering nomenclature, operating principles, types of assemblies, capacity, and standard accessories and materials of construction; Part 11, Test Code for Steam Jet Ejectors, covering purpose of code, scope of code, and illustrations; and Part III, Steam Jet Vacuum Refrigerator Equipment, covering nomenclature, definitions, performance, construction, standard units, and special types.

Heat Exchange Institute. Tubular Exchanger Section, 1937. This standard covers nomenclature, heat exchanger shells, tube sheets, baffles and support plates, heat exchanger tubes, standards of construction, fouling factors, table of factors, terminal design data, terminal properties of fluids, and index.

Heating, Piping and Air Conditioning Contractors National Association. Net Load Recommendations for Heating Boilers, 1943. Published semi-annually. The term net load as used in this book means the total amount of free standing radiation, or its equivalent, that is to be supplied with heat by the boiler. Gives valuable data of a general nature and gives tables showing the latest data from the leading manufacturers of boilers.

Hydraulic Institute. Thermodynamics of Boiler Feeding, 1941. Covers description of feed cycles in general, discussion of pumping power and mechanical problems with relation to feedwater temperature, analysis of temperature rise in boiler feed pumps, thermodynamic efficiency of boiler feed pumps, disposal of by-pass and leak-offs, and discussion of minimum permissible capacities.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Oil Burner Ordinance, Detailed Form (for Power and Heating Installations). Suggested ordinance regulating installation and operation of oil burning equipments and oil storage in connection therewith. Gives definitions, requirements for approved equipment, installation of tanks, vents, gauging, piping, valves, pumps, preheaters, controls, wiring, and installation of burner.

Steel Heating Boiler Institute. Code for the Rating of Steel Heating Boilers, 1936. Gives purpose, rating, heating surface, grate area, furnace volume, table 1 showing standard ratings, and table 2 showing standard pipe connection openings.

703.1 BOILERS AND DONKEY ENGINES

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Boilers and Other Pressure Containers. Include requirements for construction and installation, materials, strength calculations, cylindrical shells, efficiency, butt straps, details of construction, unstayed heads, stayed surfaces, stays, holes for stays and tubes, manholes and other openings, furnaces and flues, headers and similar fittings, tubes, boiler mountings, steam stop valves, safety valves, feed valves, blow-off valves, water gauges, pressure gauge, salinometer valve; superheaters, economizers, and similar equipment; installation, hydrostatic tests, and spare parts and equipment.

American Gas Assn. Approved by American Standards Assn., Z 21.33-1942. Requirements for Installation of Gas-Burning Equipment in Power Boilers. Gives requirements for boiler room ventilation, accessibility for cleaning and inspection, flues and flue connections, installation of burners and controls, gas piping and meters, and inspections and tests.

American Petroleum Institute, Production Div. Standard 2; 1942. Specification for Oil Field Boilers (Locomotive Type). Covers 6 sizes of locomotive type boilers, and contains stipulations on chemical and physical properties of materials, and dimensional sizes, with standard working pressures. Also complete standards on fittings, stacks, etc., for each size. It also defines a boiler horsepower.

Steel Heating Boiler Institute. Standard Specifications, 1936. Gives construction requirements, trimmings, pipe connection openings, firing tools, grates, base heights, smoke outfits, painting, guarantee, certification, and method of boiler selection.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H5; 1923. American Standards Assn., B13-1924. American Logging and Sawmill Safety Code. For donkey engines and boilers, requirements on minimum factor of safety, number, general location, and protection of water glasses, gauge (try) cocks, and gauges, capacity and type of safety valve, guarding of engine moving parts.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for construction of cylindrical shells, shell joints, domes and steam chimneys, heads, openings and reinforcements, stays and reinforcements, tube sheets of water-tube boilers, combustion chambers and tube sheets of fire-tube boilers, furnaces, and flues.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for rivet iron and iron rivets—material, chemical composition, tensile properties, bend tests, test specimens, number of tests, micrographic tests, physical properties and tests, workmanship and finish, inspection, and rejection. In substantial agreement with American Society for Testing Materials Standard Specification A152-39.

U. S. Gov., U. S. Army, Medical Department. Specification 84-44; 1939. Boiler, Steam, Hospital, Cooking and Sterilizing.

References.—Locomotives, *see* 701.3; house heating boilers, *see* 614.4; fire brick, *see* 534.12; boiler plates, *see* 604.11; staybolt iron bars, *see* 603.1; boiler tubes, boiler accessories, *see* 703.2, 703.9; boiler rivets, *see* 608.4; operating practice and installation, *see* 703.0; test codes and inspection rules, *see* 700., 703.0; boiler gaskets, *see* 707.11.

703.2 BOILER TUBES

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Boiler Tubes. Include rules for inspection and tests.

American Society for Testing Materials, B 13-41; 1941. A.S.M.E. Boiler Construction Code Specification SB-13. Seamless Copper Boiler Tubes. Covers arsenical and nonarsenical tubes for locomotive boilers, Basis of purchase, manufacture, chemical analysis, temper; flange, crush, and hydrostatic tests; test specimens, number of tests, retests, standard weights, weight and dimension tolerances, workmanship and finish, marking, inspection, rejection, and rehearing.

American Society for Testing Materials, B 14-18; 1918. Seamless Brass Boiler Tubes. For locomotive boilers; requirements for manufacture, chemical composition, temper, flange test, flattening and doubling-over test, hydrostatic test, specimen, standard weights, permissible variations in dimensions, finish, and inspection.

American Society for Testing Materials, A 83-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-83. American Standards Assn., B36.12; 1944. Lap-Welded and Seamless Steel and Lap-Welded Iron Boiler Tubes. Includes boiler tubes and flues, safe ends, arch and stay tubes, and seamless superheater and small boiler tubes. Gives process, chemical composition, check analysis, flattening test, flange test, crush test, hydrostatic test, etch test for charcoal-iron tubes, test specimens, number of tests, retests, forming operations, standard weights, permissible variations, in dimensions and weight, finish, marking, inspection, and rejection. A.S.T.M. Emergency Alternate Provision EA-A 83; 1942, affected section 17, marking.

American Society for Testing Materials, A 178-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-178. American Standards Assn., B36.13; 1944. Electric-Resistance-Welded Steel and

Open-Hearth Iron Boiler Tubes. Covers boiler tubes, boiler flues, superheater flues, safe ends and arch tubes. Gives manufacture, chemical composition, check analysis, flattening tests, flange test, crush test, tensile properties, hydrostatic test, test specimens, number of tests, retests, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 178, 1942 affected section 18, marking.

American Society for Testing Materials, A 179-44; 1944. Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes. Covers 1/2 in. up to 2 in. in outside diameter. Gives chemical composition, check analysis, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in dimensions, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 179, 1942 affected section 9, hydrostatic test.

American Society for Testing Materials, A 192-44; 1944. A. S. M. E. Boiler Construction Code Specification SA-192. American Standards Assn., B36.14; 1944. Seamless Steel Boiler Tubes for High-Pressure Service. Covers tubes 1/2 in. and larger in diameter. Gives requirements for manufacture, chemical composition, check analysis, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 192; 1942 affected section 4, chemical composition.

American Society for Testing Materials, A 199-44; 1944. Seamless Cold-Drawn Intermediate Alloy-Steel Heat-Exchanger and Condenser Tubes. Covers several grades of chromium-molybdenum and chromium-molybdenum-silicon tubes in sizes from 1/2 in. to 2 in. in outside diameter. Gives manufacture, chemical composition, check analysis, tensile properties, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in dimensions, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 199; 1942 affected table I chemical requirements, section 9 hardness.

American Society for Testing Materials, A 200-44; 1944. Seamless Intermediate Alloy-Steel Still Tubes for Refinery Service. Covers several grades of chromium-molybdenum and chromium-molybdenum-silicon still tubes, 2 in. and over in outside diameter and thicker than No. 5 B. W. G. Gives manufacture, chemical composition, check analysis, tensile properties, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations, in dimensions and weight, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 200; 1942 affected table I chemical requirements, section 9 hardness.

American Society for Testing Materials, A 209-44; 1944. A. S. M. E. Boiler Construction Code Specification SA-209. Seamless Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes. Covers three grades, with requirements for manufacture, chemical composition, tensile properties, flattening, flaring, hardness and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 209; 1942 affected table I, chemical requirements.

American Society for Testing Materials, A 210-44; 1944. A. S. M. E. Boiler Construction Code Specification SA-210. American Standards Assn., B36.15; 1944. Medium-Carbon Seamless Steel Boiler and Superheater Tubes. Covers boiler tubes and flues, including safe ends, arch and stay tubes, and superheater tubes. Gives requirements for manufacture, chemical composition, check analysis, tensile properties, flattening, flaring, hardness, and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection.

American Society for Testing Materials, A 213-44; 1944. A. S. M. E. Boiler Construction Code Specification SA-213. American Standards Assn., B36.17; 1944. Seamless Alloy-Steel Boiler and Superheater Tubes. Includes ferritic and austenitic steels. Gives requirements for manufacture, chemical composition, check analysis, tensile properties, flattening, flaring, hardness, and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision, EA-A 213a; 1944 affected table I chemical requirements of ferritic steel, table II chemical requirements of austenitic steel, section 9 hardness.

American Society for Testing Materials, A 214-44; 1944. A. S. M. E. Boiler Construction Code Specification SA-214. Electric-Resistance-Welded Steel Heat-Exchanger and Condenser Tubes. For tubes up to 2 in. outside diameter. Gives manufacture, chemical composition, check analysis, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, retreatment, permissible variations in dimensions, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 214a; 1943 affected section 3 manufacture, section 6 flattening test, section 8 hardness test, and section 9 hydrostatic tests.

American Society for Testing Materials, A 226-44; 1944. A. S. M. E. Boiler Construction Code Specification SA-226. American Standards Assn., B36.18; 1944. Electric-Resistance-Welded Steel Boiler and Superheater Tubes For High-Pressure Service. Covers tubes 1/2 in. and larger in diameter. Gives manufacture, chemical composition, check analysis, flattening test, flaring test, hardness test, hydrostatic test, test specimens, number of tests, retests, forming operation, standard weights, permissible variations in dimension and weight, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 226; 1942 affected section 4 chemical composition, and section 17 marking.

American Society for Testing Materials, A 249-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-249. Atomic-Hydrogen-Arc-Welded and Electric-Resistance-Welded Alloy-Steel Boiler and Superheater Tubes. For tubes made from austenitic steels. Gives process, manufacture, chemical composition, check analysis, tensile properties, flattening, flaring, hardness, and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, and rejection. A. S. T. M. Emergency Alternate Provision EA-A 249a; 1944 affected table I, chemical requirements.

American Society for Testing Materials, A 250-44; 1944. A.S.M.E. Boiler Construction Code Specification SA-250. Electric-Resistance-Welded Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes. For three grades of electric resistance-welded, carbon-molybdenum alloy-steel boiler and superheater tubes. Gives process, manufacture, chemical composition, check analysis, tensile properties; flattening, flaring, hardness, and hydrostatic tests; test specimens, number of tests, retests, retreatment, forming operations, standard weights, permissible variations in dimensions and weight, finish, marking, inspection, rejection, and rehearing. A. S. T. M. Emergency Alternate Provision EA-A 250; 1942 affected table 1 chemical requirements, and section 19 markings.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Boiler Tubes, Lap-Welded, Electric Resistance Welded and Seamless Steel and Lap-Welded Charcoal Iron. Specification M-108-43; 1944. For boiler tubes, boiler flues, superheater tubes, and safe ends for locomotives. Arch tubes shall be seamless steel. Gives manufacture, chemical and physical properties and tests, weights, dimensions, permissible variations, workmanship and finish, marking, and inspection and rejection.

U. S. Gov., Federal Specification WW-T-721; 1932. Tubes; Boiler, Charcoal-Iron, Lapwelded. Covers one grade of lapwelded, knobbled, hammered, charcoal-iron boiler tubes, boiler flues, superheater tubes, safe ends and arch tubes. Gives detail requirements and standard weights; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U.S. Gov., Federal Specification WW-T-731a; 1933. Amendment 2; 1935. Tubes; Boiler, Steel. Covers steel boiler tubes, boiler flues, superheater tubes, safe ends, and arch tubes, of two grades—A and B. Gives requirements for chemical properties and standard weights; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 44T3f; 1944. Tubes; Boiler, Seamless.

U. S. Gov., Navy Dept. Specification 44T11a; 1935. Tubes; Boiler, Steel, Commercial.

U. S. Gov., Navy Dept. Specification 44T42; 1944. Tubes; Boiler, Resistance-Welded.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for construction of boiler and superheater tubes.

U. S. Gov., United States Maritime Commission. Specification 13-MC-1; 1941. Cleaners; Boiler Tube, Rotary, Water-Driven. Shall be of but one type and grade. Gives requirements for sizes, materials, workmanship, hose couplings, motors, turbine wheel, bearings, lubrication, cutting head, sampling, inspection, and tests, together with drawings.

References.—Methods of testing and general requirements for metals, *see* 600.1; methods of testing copper and brass, *see* 641.0, 644.11.

703.3 FURNACES AND BURNERS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Oil Burning Equipment. Gives requirements for oil burner and fuel oil storage tank installations.

U. S. Gov., Navy Dept. Specification 50F3; 1938. Furnaces; Crucible, Tilting, for Shipboard Use.

U. S. Gov., Navy Dept. Specification 60B2; 1943. Burners; Fuel-Oil for Shipboard Use.

703.9 MISCELLANEOUS BOILER AND CONDENSER ACCESSORIES

American Society of Mechanical Engineers. Power Test Code. Feedwater Heaters, 1927. Applies to open and closed boiler feedwater heaters, with auxiliary sections on general considerations, pressure measurement, temperature measurement, and measurement of time.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Rules for Boiler Washing. Frequency of washing, cooling boilers, procedure, detail diagrams of washout nozzels, inspection, and filling.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Superheater Equipment for Locomotives, Care and Maintenance of. Requirements for installation, detail as to attachment to shell, hydrostatic test, details as to operations, care, and maintenance.

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wash-out and Fill Systems for Locomotive Boilers. Hot water wash-out systems for washing and testing locomotive boilers, in ejector, pump and heater, and blow-back types.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. Approved by American Standards Assn., Z 12.1-1942. Code for the Installation of Pulverized Fuel Systems. Includes storage and unit type systems; requirements for location and construction of building, ventilation and dust collection, supervision of pulverizer, magnetic separator, electrical equipment, grounding, blowers, driers, pipe lines, storage bins, ignition, screw conveyors, and for fire protection.

U. S. Gov., Federal Specification WW-T-696; 1934. Amendment 1; 1944. Traps; Radiator, Thermostatic, Brass or Bronze, Low-Pressure, 100-Square-Foot Size (for Land Use). Covers type without bypass (either hot water or steam type) up to and including 100 sq. ft. cast iron direct actual radiation; and shall be the angle, offset corner, or offset straightway pattern. Gives requirements for material and workmanship, marking, threads, machining, thermostatic members, adjustment, and details; methods of inspection and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 13C6c; 1944. Cleaning-Outfits; Boiler-Tube, Air-Driven.

U. S. Gov., Navy Dept. Specification 17C19; 1944. Contact-Makers for Superheated Steam.

U. S. Gov., Navy Dept. Specification 17I19b; 1943. Indicating-Equipment; Salinity for Shipboard Use.

U. S. Gov., Navy Dept. Specification 45T1c; 1938. Traps, Steam; Open Bucket and Continous Flow for Shipboard Use.

U. S. Gov., Navy Dept. Specification 45T2b; 1942. Traps, Steam; Thermostatic for Shipboard Use.

U. S. Gov., Navy Dept. Specification 45T3; 1945. Traps, Radiator, Thermostatic, Low-Pressure, 100-Square-Foot-Size, for Land Use.

U. S. Gov., Navy Dept. Specification 57T5c; 1944. Testing-Outfits; Boiler-Water.

U. S. Gov., Navy Dept., U. S. Coast Guard. Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof, also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for construction of superheaters, headers, water walls, economizers, safety valves and relief valves, boiler mountings and attachments, evaporators, heater, traps, separators, and miscellaneous appliances.

References.—Brass, Muntz metal, and admiralty metal condenser tubes, *see* 645.24; Muntz metal condenser tube plates, *see* 644.21; condenser tube packing, *see* 707.23, 707.25; cast iron, *see* 611.11; test codes for various steam plant accessories and equipment, *see* 703.0; oil burner ignition transformers, *see* 713.5.

704. OIL ENGINES

704.0 GENERAL ITEMS

American Society of Mechanical Engineers. Automotive Diesel Engines Cost and Performance Data for 1942. Published, 1944. This tabulation of 1942 data contains information received from 14 owners and operators of Diesel-powered busses and trucks. The costs, here presented, relate specifically to Diesel engines and include cost of fuel delivered, but less tax; fuel taxes; cost of lubricating oil delivered, but less tax; lubricating oil taxes; cost of engine maintenance.

American Society of Mechanical Engineers. Report on Oil Engine Power Cost for 1942. Published, 1944. Presents information on performance cost of 160 oil-engine power plants, also such production costs as fuel, lubrication, attendance and superintendence, supplies and miscellaneous, engine, and other plant repairs. Comparative costs from 1929 to 1942 are also included.

American Society of Mechanical Engineers. Power Test Code. Internal-Combustion Engines, 1930. Tests apply to all forms of internal-combustion engines, but are limited to the engine alone, with auxiliary sections covering general considerations, pressure measurements, temperature measurement, electrical measurements, measurement of time, speed measurements, measurement of surface area, density determinations, and determination of viscosity of liquids.

National Board of Fire Underwriters. Internal Combustion Engines and Coal Gas Producers, No. 37; 1934. Recommended good practice requirements for installation and use. Covers internal combustion engines giving definition of special terms, location of engines, capacity and location of fuel tanks for carburetion engines, capacity and location of fuel tanks for compression ignition engines, withdrawal of fuel from tank, fuel piping and fittings, carburetor, fuel feed cup on mixing valve, ignition and starting, exhaust piping, muffler or exhaust pot, lubricating oil drips, pans, etc., engine base, gas pressure regulators. gas bag, and care and attendance; and covers coal gas producers giving pressure systems and suction systems.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Internal Combustion Engines (Gas, Gasoline, Kerosene, Fuel Oil). Covers recommended good practice requirements for installation and use, including location, capacity of fuel tanks, carburetion, ignition and starting, exhaust piping, mufflers, lubricating oil drips, engine base, gas pressure regulators, gas bag, and care and maintenance.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-64; 1944. Pre-Oiling and Ground Operation of Engines Installed in Aircraft.

U. S. Gov., Dept., of Commerce, National Bureau of Standards. Commercial Standard CS102E-42; 1942. Diesel and Fuel-Oil Engines (Export Classifications). The purpose of this standard is to set up definitions and requirements for fair competition and a better understanding between buyers and sellers of stationary, marine and portable Diesel and fuel-oil engines in export from the United States of America, and to provide a uniform basis for compliance through the use of labels or certificates.

U. S. Gov., Interstate Commerce Commission, Bureau of Locomotive Inspection. Laws, Rules, and Instructions for Inspection and Testing of Locomotives Other Than Steam, 1926. Requirements mandatory by law, regarding provision and capacity of safety valves for air brake reservoir, operating characteristics of compressor governor and testing of air brake compressors and reservoirs, maximum brake cylinder travel, lost motion in articulated connections or between chafing irons or couplers, permissible side motion and fit requirement at pin and rod bearings, permissible lateral motion in wheel bearings, intermembering of truck center plates, clearance of side bearings, uniform diameter of wheels, pressing of wheels on axle, minimum width of tires, windows in cab, cab heating, location of cab lights, of whistles, bells and sanders, locking and grounding of pantographs, voltage test of jumpers, provision of safety cut-out valve for fuel, grounding of tanks, and provision for starter for internal combustion engines, for boilers the minimum allowed factor of safety, permissible stresses in stay bolts and braces, design strength of mateials and rivets, inspection and hydrostatic test of boiler, testing of stay bolts, location, testing and connection of steam gauges, number, location, and setting of safety valves, water glass and gauge equipment, connection of tubes into tube sheets of feed water appliances, etc., permitted wear limits and defects appearing in service.

704.1 OIL ENGINES

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Internal Combustion Engines. Include requirements for construction and installation, drawings and data to be submitted, supplementary requirements, material requiring test and inspection, general installation, general construction, governor control, bedplate, cylinder, liners, cylinder covers, pistons, crankshafts, crankshaft webs, lineshafts, thrust shafts, tube shafts, tailshafts, tailshaft liners, hollow shafts, coupling bolts, engine auxiliaries, oil transfer and filling system, fuel oil injection system, scavenging air system, lubricating oil system, cooling water system, exhaust system, injection air system, air containers, starting batteries, boilers, hydrostatic tests, trial, and spare parts and equipment.

Assn. of American Railroads, Mechanical Division, Electrical Section. Manual of Standard and Recommended Practice, 1941. Automotive and Electric Rolling Stock. Covers lubricating oil filters for Diesel engines, reclamation and reconditioning of Diesel engine parts, and specifications for Diesel electric switching locomotives of total weight of 95 tons and above.

Diesel Engine Manufacturers' Assn. Marine Diesel Engine Standards, 1940. Includes standard performances, equipment and definitions, design and construction, classification and marine inspection, applications to ships and dredges, fuel oil, foundations and seatings, propellers and torsional vibration, starting systems, cooling-water systems, fuel oil systems, lubrication, air-intake, and exhaust systems.

Diesel Engine Manufacturers' Assn. Standard Practices, 1935. Included power-plant buildings, construction of engines, governors, and speed regulation, erection, fuel-oil storage systems, lubrication, cooling-water systems, intake and exhaust systems, generators and electrical equipment, torsional vibration and critical speeds, outline of specifications for bids; and diagrams and charts covering altitude ratings, fuel consumption, demand curves, plant layouts, fuel storage tank installations, cooling systems, air mufflers, exhaust-heat boilers, and field testing.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. SAE Standard Engine Test Codes. Revised, 1943. For Diesel and gasoline engines. Gives curves, r.p.m.,—horsepower, torque, and charts.

U. S. Gov., Army Air Forces. Specification 32458; 1944. Power Plant; Diesel-Engine-Driven Electric, Type F-1.

U. S. Gov., Army Air Forces. Specification 32459; 1944. Power Plant; Diesel-Engine-Driven Electric, Type, F-2.

U. S. Gov., Army Air Forces. Specification 32460; 1944. Power Plant; Diesel-Engine-Driven Electric, Type, F-3.

U. S. Gov., Army Air Forces. Specification 32469 (4); 1944. Power Plant; Diesel-Engine-Driven Electric, General Specification for.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-499. Refiners; Oil, Lubricating, Automatic, for "Superior" Diesel Engines.

U. S. Gov., U. S. Army Ordnance Dept. Specification 89-2300; 1939. Power Plant; Diesel-Engine-Driven, 5 k. v. a.

References.—Installation and fuel supply, *see* 704.0, 705.0; cast iron, cast steel, forged steel, *see* 611.11, 611.41, 611.51, and 611.52; testing forms, *see* 704.0; test code for internal combustion engine, *see* 705.0; metal fits, *see* 615.82.

705. GASOLINE ENGINES AND GAS ENGINES

705.0 GENERAL ITEMS

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 10—Flue and Exhaust Gas Analyses, 1936. Recommends methods to be used in the analysis of flue gases from furnaces, and exhaust gases from internal-combustion engines.

American Society of Mechanical Engineers. Power Test Code. Internal-Combustion Engines, 1930. Tests apply to all forms of internal-combustion engines but are limited to the engine alone. With auxiliary sections on general consideration, pressure measurements, temperature measurement, electrical measurements, measurement of time, speed measurements, measurement of surface areas, density determinations, and determination of viscosity of liquids.

Internal Combustion Engine Institute. Standard Warranties, Field Service, Returns and Expenses, 1933. Gives warranty period for various classes of service, regulations covering field service, return of new material, labor and other expenses.

Internal Combustion Engine Institute. Testing and Rating Procedure for Engines and Power Units, 1934. Conforms to S.A.E. procedure, except for fixed carburetor setting, fan and generator omitted, speed variation, and fuel used; requirements for standard barometer, stripped engine curve, allowable variation for production engines; for power unit ratings for intermittent maximum or variable load, and for continuous load; and example of typical specification sheet.

National Board of Fire Underwriters. Internal Combustion Engines and Coal Gas Producers, No. 37; 1934.

Recommended good practice requirements for installation and use. Covers internal combustion engines giving definition of special terms, location of engines, capacity and location of fuel tanks for carburetion engines, capacity and location of fuel tanks for compression ignition engines, withdrawal of fuel from tank, fuel piping and fittings, carburetor, fuel feed cup on mixing valve, ignition and starting, exhaust piping, muffler or exhaust pot, lubricating oil drips, pans, etc., engine base, gas pressure regulators, gas bag, and care and attendance; and covers coal gas producers giving pressure systems and suction systems.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Internal Combustion Engines (Gas, Gasoline, Kerosene, Fuel Oil). Covers recommended good practice requirements for installation and use, including location, capacity of fuel tanks, carburetion, ignition and starting, exhaust, piping, mufflers, lubricating oil drips, engine base, gas pressure regulators, gas bag, and care and maintenance

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Standard Engine Test Codes. Revised, 1943. For Diesel and gasoline engines. Gives curves, r.p.m., horsepower, torque, and charts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R161-35; 1935. Packaging of Automotive (Bus) Engine Parts. This recommendation establishes a simplified schedule for packaging of automotive engine parts for busses operated by electric railway companies. Sponsored by the American Transit Engineering Association.

U. S. Gov., Interstate Commerce Commission, Bureau of Locomotive Inspection. Laws, Rules, and Instructions for Inspection and Testing of Locomotives Other Than Steam, 1926. Requirements mandatory by law, regarding provision and capacity of safety valves for air brake reservoir, operating characteristics of compressor governor and testing of air brake compressors and reservoirs, maximum brake cylinder travel, lost motion in articulated connections or between chafing irons or couplers, permissible side motion and fit requirements at pin and rod bearings, permissible lateral motion in wheel bearings, intermembering of truck center plates, clearance of side bearings, uniform diameter of wheels, pressing of wheels on axle, minimum width of tires, windows in cab, cab heating, location of cab lights, of whistles, bells and sanders, locking and grounding of pantographs, voltage test of jumpers, provision of safety cut-out valve for fuel, grounding of tanks, and provision for starter for internal combustion engines, for boilers the minimum allowed factor of safety, permissible stresses in stay bolts and braces, design strength of materials and rivets, inspection and hydrostatic test of boiler, testing of stay bolts, location, testing and connection of steam gauges, number, location, and setting of safety valves, water glass and gauge equipment, connection of tubes into tube sheets of feed water appliances, etc., permitted wear limits and defects appearing in service.

705.1 AUTOMOBILE ENGINES

References.—Automobile engine parts and accessories, *see* 722.31, 722.32, 722.33; test code and installation rules, *see* 705.0, 700.

705.2 MOTORBOAT ENGINES

U. S. Gov., Navy Dept. Specification 10E2a; 1942. Engines; Gasoline, Outboard, Portable.

References.—Motorboat requirements, *see* 725.3; standard magneto mountings, *see* 705.5.

705.3 PUMPING ENGINES

American Petroleum Institute, Div. of Production. Code 11-B; 1933. Code of Recommended Field Practice—Installation, Operation and Care of Oil Field Gas Engines. Applies to the installation, operation, and care of internal combustion engines for oil field service, similar to the service specified in A.P.I. Standard 11-C.

American Petroleum Institute, Div. of Production. Standard 11-C; 1942. Specifications for Internal-Combustion Engines and Clutches for Oil-Field Service. Covers dimensional standards only on foundation bolts, flange clutch connections, exhaust openings, indicator connections, and I.C. engine rating forms. Dimensional standards are given only on those items wherein interchangeability is essential, these being for the connections between the reverse gear clutch and engine flywheel, for the foundation bolt sizes, and for the exhaust and air intake openings and indicator connections.

American Petroleum Institute, Div. of Production. Standard 11-D; 1943. Supplement 1; 1944. Miscellaneous A.P.I. Pumping Equipment Standards. This specification provides: (a) Complete interchangeability between manufacturers on polished rods, bore of stuffing boxes, pull rods and pull rod couplings; (b) standard openings in screened or slotted pipe with standard method of designation; (c) a recommended standard assembly of well-head pressure gage taps and fittings to avoid confusion and delay in the field.

American Petroleum Institute, Div. of Production. Standard 11-E-1; 1941. Specification for rating of Roller-Chain Speed Reducers for Pumping Machines. Provides a method of rating of roller-chain drives in speed reducers; does not cover chemical properties of material, nor use of the equipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 87-1C; 1943. Pumping Set, Centrifugal, Gasoline Engine Driven, Capacity 55 G.P.M.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-3; 1930. Engine, Gasoline, 5 h.p.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-4; 1930. Engine, Gasoline, 10 h.p.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-5; 1930. Engine, Gasoline, 15 h.p.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-6; 1930. Engine, Gasoline, 20 h.p.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-7; 1930. Engine, Gasoline, 40 h.p.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-8; 1930. Engine, Gasoline, 50 h.p.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-9; 1930. Engine, Gasoline, 60 h.p.

References.— Steam pumping engines, *see* 701.1; test codes and installation rules, *see* 705.0, 700; magneto mountings and governor, *see* 705.5.

705.4 GASOLINE ENGINES FOR ELECTRIC GENERATORS

American Institute of Electrical Engineers. A.I.E.E. No. 11; 1943. American Standards Assn., C35.1-1943. Rotating Electrical Machinery on Railway Locomotives and Rail Cars and Trolley, Gasoline-Electric and Oil-Electric Coaches. Includes all rotating electrical machinery forming a part of the power equipment of electrically-propelled railway cars and locomotives (including trolley, gasoline-electric, and oil-Electric coaches). Covers definitions, rating, insulation, dielectric tests, insulation resistance, commutation, overspeed tests, efficiency, and characteristic curves.

Underwriters' Laboratories, Inc. Standard Specifications for Electric Lighting Plants, 1921. For isolated use, internal combustion-engine-driven electric generator, with or without auxiliary storage batteries, and accessories. Includes gasoline, kerosene, and fuel oil engines, with inside or outside fuel supply tanks. Capacity, location, materials, construction, vents, fuel feed, valves, piping, ignition, governor, exhaust system, lubrication, generator, switchboard, batteries, enclosure, and marking.

U. S. Gov., Army Air Forces Specification 32397-A-1; 1944. Plant; Electric Power, Type C-13A (Gasoline Engine Driven—Portable).

U.S. Gov., Army Air Forces Specification 32448; 1943. Plant; Electric Power, Type B-8 (Gasoline Engine Driven—Stationary).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32287-A; 1941. Plant, Power; Electric Type C-9 (1500 Watt).

U. S. Gov., U. S. Army, Medical Department. Specification 10-2972B; 1941. Power Plant; Electric Gasoline, Portable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-402B; 1930. Power Unit, Type PE-( )-41, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-466B; 1931. Power Unit, Type PE-( )-40, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-688C; 1942. Power Unit, Type PE-49-( ), Gasoline Engine Driven, for Radio Sets and Motors, Types MO-7-( ) and MO-9-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-865; 1938. Power Unit, Type PE-60-( ), Gasoline Engine Driven, 2 Kva., Dual Voltage.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-912A; 1941. Power Unit, Types PE-52-( ) and PE-53-( ), 3 Kilovolt Amperes, Gasoline-Engine-Driven Generator.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-951A; 1938. Power Unit, Type PE-56-( ), Gasoline Engine Driven For Radio Sets.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-952A; 1942. Power Unit, Type PE-75-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1038A; 1943. Power Unit PE-77-( )'43.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1061; 1942. Power Unit PE-95-( ),5 kw Gasoline-Electric Power Unit.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1083; 1942. Power Unit PE-99-( ),120-volt, 60-cycle, 3-phase, 7.5-kva., Gasoline Driven Special Application Feature; Not General Purpose Power Unit.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1130; 1942. Power Unit, PE-90-( ), Dual Voltage, Gasoline Engine or Electric-Motor Driven.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3016; 1944. Power Unit PE-197-(5 KW Gasoline-Electric Power Unit).

References.—Test codes, *see* 705.0, 700; magneto mountings and governor, *see* 705.5; direct current generators, *see* 711.12.

705.5 GASOLINE ENGINE ACCESSORIES AND PARTS

References.—Automobile engine parts, *see* 722.31, 722.32; gaskets for gas engine exhaust and fuel and water connections, *see* 707.11.

705.6 AIRPLANE ENGINES

Society of Automotive Engineers. Aeronautical Material Specification 2574; 1943. Preservations of Engines (Limited Period). Provides preparing aircraft engines to resist corrosion during shipment and limited storage under favorable conditions. Material and equipment, preliminary operation, preparation for storage procedure, recommended procedure for represervation, and general.

Society of Automotive Engineers. Aeronautical Recommended Practice 2; 1943. Horsepower Correction Formulae. Considered applicable to aircraft engines having integral supercharging without after-cooling, and using gasoline introduced at the entrance to the supercharger. Engines normally single- and two-speed engines. Does not apply to engines having two-stage or exhaust turbo supercharging. Section A applicable to engines having a supercharging less than 500 ft. per second. Section B applicable to engines having a supercharging greater than 500 ft. per second.

Society of Automotive Engineers. Aeronautical Standard 1; 1941. Altitude Graphs, Aircraft Engine Performance. Illustrate the altitude graph sheets that are recommended as standard for the presentation of aircraft engine performance data. Two sizes—(8.5 in. x 11 in. and 11 in. x 19 in.) are shown for 25,000 and 50,000 ft. altitude range respectively. These sheets contain a section which may be used either for presentation of sea level data or for other information.

Society of Automotive Engineers. Aeronautical Standards 16, 17, 18, and 19; 1941. Performance Presentation, Aircraft Engine. Give figures illustrating the use of Aeronautical Standard 1 (Society of Automotive Engineers)—Altitude Graph Sheets, Aircraft Engine Performance—in the preliminary presentation of engine power characteristics of-(16) single speed engines, (17) two speed engines, (18) two-stage engines, and (19) engines for use with an exhaust turbo supercharger.

Society of Automotive Engineers. Aeronautical Standard 20; 1941. Definitions, Aircraft Engine. These definitions are in substantial agreement with those found in military specification, and include additional definitions considered necessary for a more thorough understanding of aircraft engine terms.

Society of Automotive Engineers. Aeronautical Standard 21; 1941. Symbols and Sketches for Pressures and Temperatures in Induction System-Aircraft Engine. Presents a standard terminology for various pressures and temperatures throughout the induction system of an aircraft engine. Figures show, schematically, the location of these pressures and temperatures.

Society of Automotive Engineers. Aeronautical Standard 174; 1944. Service Bulletins for Aircraft Engines (Preparation of). For the purpose of supplying all necessary instructions to accomplish modifications to delivered equipment and to disseminate information on revised operation, service and overhaul procedures. Gives scope, general requirements, and detail requirements.

Society of Automotive Engineers. Aeronautical Standard 176; 1944. Tables of Limits and Limits and Lubrication Charts. To be used in connection with maintenance, service, and repair of aeronautical engines. Gives scope, general requirements, and detail requirements.

Society of Automotive Engineers: Aeronautical Standard 177; 1944. Operating Instructions for Aircraft Engines. Gives purpose, scope, general requirements, detail requirements, and preparation of manuscript copy.

U. S. Gov., Army Air Forces Specification 28144; 1933. Development Test of Aircraft Engines.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-80b; 1944. Corrosion Prevention; Method of Handling Aircraft Engines at Aircraft Plants for.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-E-568c; 1944. Engines, Aircraft; Preparation for Storage, Process of.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-9-1; 1943. Handbooks; Service Instruction (for Aircraft Engines).

U. S. Gov., Army-Navy Aeronautical Specification AN-H-10; 1942. Handbooks; Overhaul Instruction (for Aircraft Engines).

U. S. Gov., Army-Navy Aeronautical Specification AN-T-25-1; 1943. Tables of Limits; Aircraft Engine (With Limits and Lubrication Charts).

U.S. Gov., U.S. Army, Army Air Forces. Specification 95-28205-C; 1937. Engine, Aircraft; Type V-1710 (Allison), Type Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-28214-C; 1936. Engine, Aircraft Type V-1570 (Wright) Type Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Sepcification 95-28215; 1934. Engine, Aircraft, V-1570 Type Wright (Direct Drive).

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-28261; 1934. Engine, Aircraft, R-1820 Type Wright (Direct Drive).

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-28263-C; 1936. Engine, Aircraft Type R-975 (Wright) Type Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-28264-B; 1936. Engine, Aircraft, Type R-760 Direct-Drive (Wright) Type Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-28265; 1936. Engine, Aircraft, Type R-1670 Geared (Wright) Type Specification for.

705.7 GASOLINE ENGINES FOR SHIP PROPULSION

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Internal Combustion Engines. Include requirements for construction and installation, drawings and data to be submitted, supplementary requirements, material requiring test and inspection, general, installation, general construction, governor control, bedplate, cylinders, liners, cylinder covers, pistons, crankshafts, crankshaft webs, lineshafts, thrust shafts, tube shafts, tailshafts, tailshaft liners, hollow shafts, coupling bolts, engine auxiliaries, oil transfer and filling system, fuel oil injection system, scavenging air system, lubricating oil system, cooling water system, exhaust system, injection air system, air containers, starting batteries, boilers, hydrostatic tests, trial, and spare parts and equipment.

References.—Test codes, *see* 705.0, 700; cast iron, cast steel, steel forgings, *see* 611.11, 611.41, 611.51, and 611.52.

706. WATER WHEELS AND WATER TURBINES

706.0 GENERAL ITEMS

American Society of Mechanical Engineers, co-sponsor with American Assn. for Advancement of Science, American Institute of Electrical Engineers, American Society of Civil Engineers, and Society for Promotion of Engineering Education. American Standards Assn., Z10.2-1942. Symbols for Hydraulics. Hydraulic engineering symbols including those used in design of water turbines and pumps.

American Society of Mechanical Engineers. Power Test Code. Hydraulic Prime Movers, 1938. Amendments, 1942. This Code presents a set of standard rules for the testing of an individual reaction or impulse turbine unit of any type. It includes description and definition of terms, and it discusses in considerable detail the various methods of measurement, and the instruments to be used.

Associated Factory Mutual Fire Insurance Companies. Pamphlet 31; 1939. Hydraulic Tables. Gives notes on testing water supplies, nozzle discharge tables, theoretical discharge through circular orifices, table for converting feet head of water into pressure in pounds, table for converting pressure in pounds into feet head of water, effective reach of fire streams, properties of numbers, rating charts for centrifugal fire pumps, rating chart for 500 and 750 g.p.m. Underwriter fire pumps, rating chart for 1000 and 1500 g.p.m. Underwriter fire pumps, friction loss in cast iron pipe, friction loss in wrought iron pipe, friction loss in cotton rubber-lined hose, friction loss in valves and fittings, friction loss in meters, rotary fire pump tables, discharge of duplex steam fire pumps, discharge of single-cylinder steam fire pumps, conversion factors, miscellaneous hydraulic formulas, and properties of pipe.

706.1 WATER TURBINES

American Society of Mechanical Engineers. Power Test Code. Hydraulic Prime Movers, 1938. A set of standard rules for the testing of an individual reaction or impulse turbine unit of any type. It includes description and definitions of terms, and discusses in detail the various methods of measurement, and the instruments to be used. With auxiliary sections on general considerations, pressure measurement, temperature measurement, head measuring apparatus, electrical measurements, measurement of time, speed measurements, and linear measurements.

References.—Speed governors for water turbines, *see* 795; metal fits, *see* 615.82.

706.2 TURBINE BUCKET WHEELS

706.3 WATER WHEEL SHAFT COUPLINGS

707. PACKING, PIPE COVERING, AND GASKETS

707.1 GASKETS

707.11 Asbestos and Metallic Gaskets

Society of Automotive Engineers. Aeronautical Material Specification 3230; 1940. Gasket, Oil-Resisting. Gasket material made from selected long fiber asbestos and rubber and/or synthetic rubber compounds which are bonded and felted together, under presure, into a sheet, which is pliable and resilient. Includes requirements for quality, tests, tolerances, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3232D; 1944. Gasket, Oil-Resisting, (High Temperature). Gasket material made from selected long fiber asbestos and special heat resisting compounds, bonded and felted together under pressure into a pliable and resilient sheet. Gives requirements for condition, quality, tests, samples, tolerances, reports, approval, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 1—Aeronautical Parts, Materials and Codes. S.A.E. Standard Aircraft Engine Copper Asbestos Gaskets. Adopted, 1941. Diagram and table of dimensions for nominal sizes from 3/16 to 4 in. in diameter.

U.S. Gov., Federal Specification HH-G-71; 1931. Gaskets; Asbestos-Copper, Corrugated. Covers one grade. Gives requirements for material, workmanship, copper, cord, dimensions, and compression strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-HH-G-71; 1942 (issued by Procurement Division, Treasury Dept., U. S. Gov.) substituted metal for annealed copper and requires corrugated disk be made of steel or iron.

U. S. Gov., Federal Specification HH-G-76a; 1944. Gaskets; Asbestos, Metallic-Cloth. Covers one grade and two types, (A) seamless and (B) jointed. Gives requirements for material, workmanship, finish, construction, yarn, weave, wire, cloth, weight, friction compound, steam test, bend test, and tolerances; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-G-101; 1930. Gaskets; Metallic-Encased. Covers two types—(A) metallic-asbestos and (B) metallic-cork; furnished with a single jacket without inlay, a single jacket with metal inlay, or a double jacket, so formed as to surround almost completely the asbestos or cork core. Gives requirements for material, construction, metal, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U.S. Gov., Federal Specification HH-G-116; 1936. Gaskets; Plumbing-Fixture-Setting. Covers five types—(A) triangular, (B) triangular skirt, (C) rectangular, (D) round, and (E) round skirt; of one piece or endless design. Gives requirements for material, construction, core; and covering; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33G2e; 1933. Gaskets, Asbestos-Metallic-Cloth (Symbol 2152).

U. S. Gov., Navy Dept. Specification 33G4a; 1941. Gaskets, Metallic-Encased.

U. S. Gov., Navy Dept. Specification 33G5b; 1942. Gaskets, Metallic Asbestos, Spiral-Wound (Symbol 2410) (for Flanged Joints in Piping Systems).

U. S. Gov., Navy Dept. Specification 33G8d; 1944. Gaskets, Asbestos-Metallic-Cover, Rubber-Core.

U. S. Gov., Navy Dept. Specification 33G11; 1942. Gaskets, Metallic-Asbestos, Spiral-wound (Symbol 2410) (for Boilers).

References.—Testing of rubber goods, *see* 200.

707.12 Paper and Fiber Gaskets

Society of Automotive Engineers. Aeronautical Material Specification 3564; 1944. Vulcanized Fiber. Covers material, application, general requirements, detail requirements, tests, quality, tolerance, approval, and rejections.

U. S. Gov., Army Air Forces Specification 40231 (1); 1939. Fibre; Hard Red Vulcanized.

U. S. Gov., U. S. Army Ordnance Department. Specification 50-11-114; 1943. Leather, Fibrated.

References.—Fiber packing for gaskets, see 707.28.

707.13 Rubber Gaskets

Assn. of American Railroads, Operations and Maintenance Dept., Machanical Div. Manual of Standard and Recommended Practice, 1944. Gaskets, Air-Brake Hose. Emergency Specifications E-M-602-44; 1944. In accordance with the requirements of Supplementary Order R-1, latest revision, of the War Production Board, to restrict the use of rubber.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Gaskets, Air-Brake Hose, M-602-38; 1938. For air-brake and air-signal hose couplings in train service, manufacture, requirements as to physical properties and tests dimensions and tolerances, workmanship, and labeling.

Society of Automotive Engineers. Aeronautical Material Specification 3230; 1940. Gasket, Oil-Resisting. Gasket material made from selected long fiber asbestos and rubber and/or synthetic rubber compounds which are bonded and felted together, under pressure, into a sheet, which is pliable and resilient. Includes requirements for quality, test, tolerances, approval, and rejections.

U. S. Gov., Army Air Forces Specification 26539-D; 1941. Rubber; Channels and Trimmings (Molded or Extruded).

U. S. Gov., Army-Navy Aeronautical Specification, AN-G-23; 1944. Gaskets; Aircraft Lighting Equipment.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-151-S. Gaskets; Fire Hose, All Sizes.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-152-S. Gasket; Canteen Top.

U. S. Gov., Federal Specification, HH-G-156a; 1944. Gaskets; Rubber (Natural or Synthetic), Molded, Sheet and Strip. Covers one type and may be of any of three classes—(1) compound utilizing polymerized chloroprene as the basic material, (2) compound utilizing a copolymer product of butadiene, and (3) compound utilizing a copolymer product of isobutylene and isoprene. Gives requirements for material workmanship, physical requirements, flexibility, tolerances in width, tolerances in thickness, dimensions of molded and strip rubber (thickness, width, and weight of sheet rubber), gaskets and specific gravity; methods of sampling, inspection and tests; and packaging, packing and marking, for shipment.

U. S. Gov., Federal Specification HH-P-161a; 1936. Packing; Rubber, Wire-Insertion. Covers one grade. Gives requirements for material, workmanship, construction, rubber wire insertion, width, tolerances, weight, bend test, boiling-water test, and steam test; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-P-161A; 1941 (issued by Procurement Division, Treasury Dept., U.S. Gov.) changed requirements for rubber content.

U. S. Gov., Navy Dept. Specification 4G1d; 1932. Gaskets; Rubber, Projectile.

U. S. Gov., Navy Dept. Specification 33G6b; 1944. Gaskets; Rubber (for Armored Hatches).

U. S. Gov., Navy Dept. Specification 33G7d; 1944. Gaskets; Oil-Resisting (Sheet, Strip, and Molded).

U. S. Gov., Navy Dept. Specification 33G9; 1941. Gaskets; Rubber, Cloth-Insertion (for Dry-dock Caissons).

U. S. Gov., Navy Dept. Specification, 33G14b; 1945. Gaskets; Rubber-Tubing, for Paint Buckets.

U. S. Gov., Navy Dept. Specification 33R1g; 1944. Rubber, Natural or Synthetic: Gaskets, Packing, Sheets, and Strips.

U. S. Gov., Navy Dept. Specification 33R4c; 1944. Rubber, Medium-Soft (for Airport, Air-Tight- and Watertight-Door, and Hatch Gaskets).

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-40C; 1940. Gasket; Rubber, for Gas Masks.

U. S. Gov., U. S. Army, Medical Department. Specification 10-2304A; 1941. Bellows; Rubber, Disk.

U. S. Gov., U. S. Army, Ordnance Department. Specification 50-11-83; 1935. Gasket; Rubber, for Cartridge Storage Cases and Smokeless Powder Boxes and Tanks.

References.—Methods of testing rubber products; *see* 200.

707.14 Cork Gaskets

References.—Metal encased cork gaskets, *see* 707.11; corkboard and compressed cork, *see* 425.2.

707.15 Sealing Compound

Society of Automotive Engineers. Aeronautical Material Specification 3087; 1944. Compound; Insulating and Sealing. A paste primarily for sealing electric joints of aircraft engine ignition systems but may be used where other gas and fluid-tight joints are required. Gives general requirements, physical properties, electrical properties, tests, reports, packing, and marking, approval, and rejections.

U. S. Gov., Army Air Forces Specification 3595 (1); 1942. Compound; Slushing, Fuel Tank.

U. S. Gov., Army Air Forces Specification 3596 (1); 1942. Compound; Sealing, Fuel Tank.

U. S. Gov., Army Air Forces Specification 3597 (1); 1942. Compound; Sealing, Oil Tank.

U. S. Gov., Army Air Forces Specification 3598; 1940. Compound; Caulking and Glazing.

U.S. Gov., Army Air Forces Specification 3603-1; 1944. Compound; Liquid Instrument Sealing.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-86a-1; 1945. Compound; Anti-Seize and Sealing (for Oxygen Systems).

U. S. Gov., Army-Navy Aeronautical Specification AN-C-125; 1944. Compound; Dip Coating Sealing.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-128-1; 1945. Compound; Insulating and Sealing.

U. S. Gov., Federal Specification TT-C-598; 1942. Compound, Calking; Plastic (for Masonry and Other Structures). Covers one type and two grades—(1) for gun application, and (2) for knife application. Gives requirements for material, color, shrinkage, bond, tenacity, rate of hardening, oil retention, slump, and cracking; methods of sampling and testing; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-C-99; 1944. Cement, Pettman.

U. S. Gov., Joint Army-Navy Specification JAN-P-115; 1944. Packaging and Packing for Overseas Shipment, Compound, Sealing, Dipcoating.

U. S. Gov., Navy Dept. Specification 33C6; 1939. Compound, Sealing, Boiler-Casing.

U. S. Gov., Navy Dept. Specification 52C21; 1944. Cement, Sealing (for Oil Tank Seams).

U. S. Gov., U. S. Army, Army Air Forces. Specification 2-86A; 1941. Compound; Joint Sealing, for Liquid-Cooled Engines.

U. S. Gov., U. S. Army, Army Air Forces. Specification 2-87; 1935. Compound; Sealing, Aircraft Instrument.

707.16 Synthetic Gaskets

Society of Automotive Engineers. Aeronautical Material Specification 3231; 1944. Gaskets; Oil Resisting, Synthetic Rubber Binder. This gasket material shall be made from selected long fibre asbestos and heat resisting synthetic rubber compounds. Gives quality, requirements, samples, tolerances, reports, approval, and rejections.

U. S. Gov., Army Air Forces. Specification 26598; 1944. Gasket; Drum Closure.

U.S. Gov., Army-Navy Aeronautical Specification AN-HH-G-171; 1942. Gaskets and Sheets; Gasoline-Oil and High-Temperature-Resisting.

U. S. Gov., Army-Navy Aeronautical Specification AN-HH-P-114b; 1943. Packings and Gaskets; Hydraulic.

707.19 Miscellaneous Specifications for Gaskets

References.—Gaskets, *see* 303.96.

707.2 PACKING

707.20 General Items

American Society for Testing Materials, D 733-43T; 1943. Tentative Methods of Testing Compressed Asbestos Sheet Packing. For evaluating the physical properties of the product known commercially as "compressed asbestos sheet packing" manufactured by bonding a large volume of asbestos fiber with a compound of natural or synthetic rubber or a mixture of both. Gives general methods, composition, sampling, measurement of thickness, tensile strength, bending test, compressibility, accelerated aging, immersion test, corrosion test, retests and rejection, and report.

707.21 Asbestos Packing

U. S. Gov., Federal Specification HH-P-31a; 1944. Packing; Asbestos, Metallic-Cloth, Sheet, and Tape. Covers one grade. Gives requirements for material, workmanship, sheet, tape, strands, friction compound, construction, tolerances, bending strength, and steam test; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification HH-P-34; 1933. Packing; Asbestos, Rod, Braided. Covers two types—(A) plain, no wire; and (B) with wire insertion. Gives requirements for material and workmanship, construction, asbestos, yarn, lubrication; and weight per lineal yard; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-36a; 1944. Packing; Asbestos, Rod, High-Pressure. Covers one grade. Gives requirements for material, workmanship, construction, cloth, yarn, friction compound, total rubber, lubrication, graphite, coils, and steam test; methods of sampling, inspection and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-41; 1931. Amendment 2; 1944. Packing; Asbestos, Rope and Wick. Covers one grade; wick packing, 1/4 in. only, and rope packing, all sizes 3/8 in. and larger. Gives requirements for material and workmanship, asbestos, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-46a; 1944. Packing, Asbestos, Sheet, Compressed. Covers one grade. Gives requirements for material and workmanship, construction, composition, asbestos fiber, thickness and weight, tolerance, tensile strength, solvents, graphite and branding; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-P-51; 1930. Packing; Asbestos, Valve-Stem. Covers four types—(A) braided and lubricated with satisfactory oils; (B) braided and frictioned with rubber compound; (C) twisted and lubricated with satisfactory oils; and (D) twisted and frictioned with rubber compound. Gives requirements for material and workmanship, asbestos, yarn, construction, lubricant, and rubber compound; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-HH-P-51, February 1943 (issued by Procurement Div., Treasury Dept., U. S. Gov.), covered changes in paragraphs A-1 and D-2. A pound of single-ply yarn shall contain 1,000 yd. ± 5 percent.

U. S. Gov., Navy Dept. Specification 33P2g; 1945. Packing; Asbestos-Metallic-Cloth, Sheet and Tape.

U. S. Gov., Navy Dept. Specification 33P5f; 1934. Packing; Asbestos, Rope, and Wick (Symbol 1102).

U. S. Gov., Navy Dept. Specification 33P13c; 1944. Packing; Sheet, Asbestos, Compressed (Symbol 2150).

U. S. Gov., Navy Dept. Specification 33P16b; 1944. Packing; Asbestos, Rod, High-Pressure (Symbol 1100).

U. S. Gov., Navy Dept. Specification 33P26b; 1944. Packing; Asbestos, Rod, Braided (Symbols 1103 and 1104).

References.—Semimetallic packing (asbestos), *see* 707.23; asbestos cloth and yarn, methods of testing, *see* 645.4; methods of testing rubber goods, *see* 200.

707.22 Flax or Hemp Packing

U. S. Gov., Federal Specification HH-P-106b; 1944. Packing; Flax, Hemp, or Cotton. Covers one grade. Gives requirements for material, workmanship, flax and hemp, cotton, cotton yarn, lubrication, and weight per linear yard for various sizes; methods of sampling, inspection, and test; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33P11; 1944. Packing, Flax- or Hemp-Fiber, Symbol 1260.

707.23 Metallic Packing

U. S. Gov., Federal Specification HH-P-126a; 1933. Amendment 1; 1938. Packing; Metallic, Flexible. Covers one grade. Gives requirements for construction, metal core, lubrication, and coils; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-128; 1938. Packing; Metallic, Flexible, Condenser-Tube. Covers one grade. Covers material and workmanship, metal rings, fiber rings, tolerances, and sizes of rings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-131a; 1933. Packing; Metallic and Nonmetallic, Plastic. Covers two grades—(A) and (B); two classes—(1) metallic and (II) nonmetallic; and four types—(A) bulk form; (B) coil form, cotton covered; (C) coil form, metal foil covered; and (D) coil form, braided wire jacket. Gives requirements for construction, asbestos fiber, graphite, binder, coils, composition, and metal; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-166a; 1944. Packing; Semimetallic. Covers one grade. Gives requirements for material, workmanship, cross section and size, construction, friction compound, metal, lubricant, coils, and details; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33P12d; 1944. Packing; Spiral, Low-Pressure, Plastic (Symbol 1300).

U. S. Gov., Navy Dept. Specification 33P15e; 1945. Packing, Condenser-Tube, Flexible-Metallic, Symbol 1435.

U. S. Gov., Navy Dept. Specification 33P17e; 1945. Packing; Metallic, Flexible, Symbol 1430.

U. S. Gov., Navy Dept. Specification 33P19e; 1945. Packing; Semimetallic, Symbols 1400 and 1402.

U. S. Gov., Navy Dept. Specification 33P21c; 1943. Packing; Lead, Shredded.

U. S. Gov., Navy Dept. Specification 33P25d; 1944. Packing; Metallic and Nonmetallic, Plastic.

U. S. Gov., Navy Dept. Specification 33P33; 1943. Packing, Semimetallic, for Stern Tubes (Symbol 1405).

U. S. Gov., U. S. Army, Corps of Engineers. Specification 84-21; 1924. Metallic Packing; Fixed-Ring Type.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 84-24; 1924. Packing; Metallic, Solid, Floating-Ring Type.

References.—Asbestos metallic cloth sheet, packing, *see* 707.21; methods of testing rubber goods, *see* 200.

707.24 Rubber Packing

U. S. Gov., Army Air Forces Specification 12023A-3; 1944. Tape; Cork-Synthetic Rubber Sealing, Adhesive Back.

U. S. Gov., Federal Specification HH-P-61c; 1944. Packing; Diaphragm. Covers one type and may be either of two classes—(A) compound utilizing polymerized chloroprene as the basic material, and (B) compound utilizing a copolymer product of butadiene and acrylonitrite. Gives requirements for material, workmanship, construction, fabric, thickness, tolerance, and physical requirements of compound; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-P-151a; 1938. Packing, Rubber; Cloth-Insertion. Covers one grade. Gives requirements for material, workmanship, plies, rubber, physical tests, fabric, width, tolerance, and accelerated aging; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-P-151a; 1943 changed requirements for composition of rubber and physical tests.

U. S. Gov., Navy Dept. Specification 33P8h; 1944. Packing, Rubber (Reclaimed); Plain and Cloth-Insertion (Symbol 2353).

U. S. Gov., Navy Dept. Specification 33P23b; 1944. Packing, Rubber-Graphite; Unvulcanized (Symbol 2352).

U. S. Gov., Navy Dept. Specification 33P31; 1941. Packing; Diaphragm.

U. S. Gov., Navy Dept. Specification 33R1g; 1944. Rubber, Natural or Synthetic: Gaskets, Packing, Sheets, and Strips.

U. S. Gov., U. S. Army, Ordnance Department. Specification 20-41C; 1940. Packing, Rubber, for Submarine Mines.

References.— Testing of rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4.

707.25 Cotton and Canvas Packing

U. S. Gov., Federal Specification HH-P-71; 1933. Amendment 1; 1944. Packing; Fabric, Condenser-Tube. Covers one grade. Gives requirements for material and workmanship, construction, weight, and lubrication; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-106b; 1944. Packing; Flax, Hemp, or Cotton. Covers one grade. Gives requirements for material, workmanship, flax and hemp, cotton, cotton yarn, lubrication, and weight per linear yard for various sizes; methods of sampling, inspection, and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-P-112a; 1944. Packing; Hydraulic. Covers two types, (I) flexible and (II) rock hard. Gives requirements for material, workmanship, construction, fabric, tolerance, expansion, flexibility, friction, and hardness; methods of sampling and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-171a; 1944. Packing; Spiral, Gland, Low-Pressure. Covers one grade. Gives requirements for material, workmanship, construction, cotton fabric, friction compound, friction test, specials, lubrication, and flexibility; methods of sampling, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 33P7g; 1941. Packing; Hydraulic (formerly Tucks) (Symbols 1301 and 1303).

U. S. Gov., Navy Dept. Specification 33P32a, 1944. Packing; Cotton, Square, Braided, Symbol 1270.

U. S. Gov., Navy Dept. Specification 33P24b; 1945. Packing; Wick, Cotton, Round.

U. S. Gov., Treasury Dept., Procurement Div. 319; 1939. Packing; Wick, Cotton, Round. Shall be made of best new cotton, thoroughtly carded and wholly free from seeds. Gives requirements for plies, weave, weight, and length; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing rubber goods, *see* 200; methods of testing textile fabrics, *see* 300.4.

707.26 Leather Packing

U. S. Gov., Federal Specification KK-L-177; 1942. Leather; Hydraulic-Packing, Mineral-Tanned, (Regular and Non-Corrosive). Covers three classes—(A) medium, (B) heavy, and (C) extra heavy; two types—(I) regular and (II) non-corrosive; and shall be in the form of butt bends. Gives requirements for trim, tannage, selection, thickness, finish, impregnation, crackiness, tensile strength, stretch, shrinkage, and chemical composition; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification KK-L-231; 1943. Leather; Packing, Chrome-Vegetable-Retanned. Gives requirements for forms (sides, bends, butt bends, or finished packings), classes (light, medium light, medium, medium heavy, or heavy), trim, tannage, selection, thickness, finish, tensile strength, stretch, crackiness, shrinkage, chemical composition, and figure showing location of samples and trim of hide; methods of sampling, inspection, and tests; and packing and marking for shipment.

References.—Methods of analysis, *see* 060.

707.27 Jute Packing

U. S. Gov., Federal Specification HH-P-117; 1940. Packings; Jute, Twisted. Covers three types—(I) dry, (II) tarred, and (III) oiled. Gives requirements for material, workmanship, and form; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

707.28 Fiber Packing

U. S. Gov., Federal Specification HH-P-91; 1931. Amendment 3; 1944. Packing; Fiber, Hard, Sheet. Covers one grade, that known commercially as B.H. or "Bone Hard." Gives requirements for material and workmanship, uniformity, color, hardness, specific gravity, thickness, tensile strength, and water absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification HH-P-96a; 1938. Amendment 1; 1940. Packing, Fiber; (for) Lubricating and Fuel-Oil. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-P-96a; 1942 (issued by Procurement Division, Treasury Dept., U. S. Gov.) changed requirements for material.

U. S. Gov., Navy Dept. Specification 33P22b; 1943. Packing, Sheet, Plant- or Animal-Fiber.

U. S. Gov., Navy Dept. Specification 33P27a; 1941. Packing; Fiber, Hard, Sheet (Symbol 2228).

References.—Methods of testing rubber goods, *see* 200; methods of testing fiber board, *see* 470.3; other fiber board, *see* 472.93.

707.29 Miscellaneous Specifications for Packings

U. S. Gov., Army Air Forces. Specification 12021-A; 1937. Packing; Synthetic Rubber and Cork Composition (Oil-Resistant).

U. S. Gov., Army Air Forces. Specification 26554-E; 1943. Sheet; Synthetic Rubber (for Packing).

U. S. Gov., Army-Navy Aeronautical Specification AN-HH-P-114b; 1943. Packings and Gaskets; Hydraulic.

U. S. Gov., Navy Dept. Specification 33P28b; 1943. Packing; Stuffing-Tube (for Asbestos-Covered and Armored Electric Cables).

U. S. Gov., Navy Dept. Specification 33P29a; 1942. Packing; Plastic (for Dogs for Water-Tight Closures).

U. S. Gov., Navy Dept. Specification 33P37; 1943. Packing; Rayon, Square, Braided (Symbol 1280).

References.—Packings, *see* 303.96.

707.3 RUBBER VALVES FOR PUMPS

U.S. Gov., Army Air Forces. Specification 26564 (1); 1940. Sheet; Neoprene (for Fuel Pump Diaphragms).

U. S. Gov., Federal Specification ZZ-V-51a; 1940. Valves; Rubber. Covers three classes—(A) hard, (B) medium, and (C) soft. Gives requirements for material hardness, dry heat test, steam test, and boiling-water test; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-V-51a; 1943 changed requirements for rubber compounds for valves.

U. S. Gov., Navy Dept. Specification 11V1b; 1942. Valves; Pump, Rubber.

References.—Methods of testing rubber goods, *see* 200.

707.4 PIPE COVERINGS AND BOILER LAGGING

707.40 General Items

American Water Works Assn. Tentative Standard Specifications for Cement-Mortar Protective Coating for Steel Water Pipe of Sizes 30 Inches and Over, 7A.7-1940. Cover the material and application requirements to obtain corrosion protection for steel water pipe by the use of portland cement mortar applied by spinning or by centrifugal machine and by guniting. Corrosion protection is provided as follows: (1) The inside of all pipe shall receive a coat of cement-mortar lining applied by spinning and guniting or by centrifugal machine; (2) the outside of all pipe shall receive a coat of steel reinforced cement mortar applied by guniting.

National Association of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Insulation; Pipe. Covers definition, classes and grades, characteristics, and forms available.

Underwriters' Laboratories, Inc. Bulletin of Research 27; 1943. Clearances and Insulation of Heating Appliances. This bulletin describes tests conducted to provide definite techanical information as a basis for promoting uniformity in the various ordinances, regulations, and standards bearing on the subject. Covers mechanism of heat transfer, test equipment, tests of protective assemblies, temperature measurements, test procedure, test results, and comments.

References.—Heat transmission tests, *see* 792.0.

707.41 Cork Pipe Coverings

U. S. Gov., Navy Dept. Specification 32C12a; 1941. Cork; Molded, Pipe-Covering.

References.—Duck for insulation coverings, *see* 707.40.

707.42 Asbestos Coverings, for Pipes and Boilers

U. S. Gov., Federal Specification HH-I-561a; 1944. Insulation; Laminated-Asbestos. Covers three types—(I) nonindented or sponge felt insulation (700°F.); (II) indented asbestos paper insulation (500°F.); (III) corrugated asbestos paper insulation (300°F.); and two classes, (A) blocks and (B) pipe covering. Gives requirements for tolerances and details covering construction, weight, conductivity, thickness, sizes, jackets, bands, and loss on heating; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U.S. Gov., Navy Dept. Specification 32A2e; 1945. Asbestos; Block, Cellular, Heat Insulation.

U. S. Gov., Navy Dept. Specification 32P6; 1938. Pipe-Covering, Molded-Asbestos.

U. S. Gov., Treasury Dept., Procurement Div. 515a; 1942. Pipe Covering; Asbestos, Air-Cell. Covers one type, one grade, and two classes—(A) canvas jacket and (B) glazed paper cover. Intended for insulation where the temperature does not exceed 300°F. Gives requirements for construction, thickness of plies, inside diameter, exterior cover, asbestos paper, sections, bands, thickness, and pipe sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Standard sizes of boiler lagging, *see* 707.40; asbestos paper, millboard, and textile, *see* 545.4; duck for insulation covering, *see* 707.40.

707.43 Magnesia Coverings for Pipes and Boilers

American Society for Testing Materials, C 193-44 T; 1944. Tentative Specification for 85 Per Cent Magnesia Thermal Insulating Cement. Covers scope, composition, physical properties, sampling and mixing, methods of testing, and rejection.

U.S. Gov., Federal Specification HH-M-61; 1934. Magnesia; Block, Cement, and Pipe-Covering (Molded). Covers one grade and four types—(I) standard thickness, (II) double standard thickness, (III) blocks, and (IV) cement or plaster. Shall contain not less than 85 percent of pure hydrated magnesium carbonate and not less than 10 percent long-fiber asbestos. Gives requirements for weight, length, thickness, size, cotton sheeting jacket, and bands; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-HH-M-61; 1942 changed requirements for cotton sheeting jacket; and deletes use of brass bands and changes their width and thickness.

U. S. Gov., Navy Dept. Specification 32P10; 1943. Plaster; Magnesia.

References.—Standard sizes of boiler lagging, *see* 707.40; duck for insulation covering, *see* 707.40.

707.44 Felt Pipe Coverings—Vegetable and Mineral

American Hospital Assn., 58-4. Hair Felt. Covers one grade and one class, that intended for pipe covering.

U. S. Gov., Federal Specification C-F-201c; 1944. Felt; Hair. Covers one grade and two classes—(A) insulating (plain), and (B) packing, padding (fabric reinforced). Gives requirements for hair felt, cotton fabric, process, thicknesses and densities, form, size of rolls, organic acidity, and alkalinity and mineral acidity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div. 516a; 1942. Pipe-Covering; Felt, Wool. Covers one type, one grade, and two classes—(A) canvas jacket and (B) glazed paper jacket. Intended for use as insulation when the temperatures are between 40°F. and 212° F. Gives requirements for material, construction, inside diameter, exterior cover, density, sections, bands, and thickness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Other specifications and methods of testing for felt, *see* 365.98; duck for insulation coverings, *see* 707.40.

707.45 Fire Clay Insulation for Boiler Furnaces

References.—Fire clay refractories, *see* 534.12.

707.46 Glass Fiber Insulation

U. S. Gov., Federal Specification HH-I-556; 1941. Insulation (Glass-Fiber); Semi-Rigid. Covers one grade and four types—(I) standard thickness, pipe covering; (II) double standard thickness, pipe covering; (III) single layer, pipe covering; and (IV) block. Gives requirements for material and workmanship, construction, weight per cubic foot, thicknesses, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

707.47 Mineral or Rock Wool Insulation

American Society for Testing Materials, C 195-44 T; 1944. Tentative Specification for Mineral Wool Thermal Insulation Cement. Covers scope, physical properties, sampling and mixing, methods of testing, and rejection.

American Society for Testing Materials, ES-14; 1942. Emergency Specifications for Blanket Thermal Insulation for Building Purposes. Cover blanket or batt thermal insulating materials furnished in flexible or semirigid form and suitable for building purposes for application to flat or curved surfaces.

American Society for Testing Materials, ES-15; 1942. Emergency Specifications for Blanket Thermal Insulation for Industrial Purposes. Cover blanket insulating materials furnished in flexible or semirigid form and suitable for industrial purposes for application on flat or curved surfaces where surface temperatures exceed 100°F.

American Society for Testing Materials, ES-16; 1942. Emergency Specifications for Blanket Thermal Insulation for Refrigeration Purposes. Cover blanket thermal insulating materials furnished in flexible or semirigid form and suitable for refrigeration purposes for application on flat or curved surfaces.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS117-44; 1944. Mineral Wool; Blankets, Blocks, Insulating Cement and Pipe Insulation for Heated Industrial Equipment. To establish minimum specifications for insulating heated surfaces with mineral wool products and provides minimum requirements for mineral wool blankets, blocks, insulating cement, and pipe insulation for insulating heated industrial equipment. Gives general requirements; detail requirements including blanket insulation, block insulation, insulating cement, and pipe insulation (blanket-type and molded-type); recommended installation requirements including auxiliary material, application, blanket insulation, block insulation, insulating cement, and pipe insulation (blanket-type and molded-type); guides for painting, maintenance, and guarantee labels and certificates.

U. S. Gov., Federal Specification HH-M-371; 1938. Mineral-Wool, Impregnated; Blanket, Block, and Pipe Covering, Molded, for Low Temperatures. Includes five types—(I) molded block; (II) molded sectional pipe covering, ice water thickness; (III) molded sectional pipe covering, brine thickness; (IV) molded sectional pipe covering, heavy brine thickness; and (V) felted blanket. Gives detail requirements for material, workmanship, conductivity, and density; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-M-371; 1942, substituted ordinary steel in lieu of copperized staples and copper-clad steel wire.

U. S. Gov., Federal Specification HH-P-386a; 1939. Pipe-Covering and Cement; Mineral or Rock-Wool. Covers one grade and three types—(I) molded sectional pipe covering; (II) felted blanket pipe covering; and (III) cement. Gives requirements for material and workmanship, sulfur, shot, stability, thicknesses, tolerance, and density; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-P-386a; 1942, changed requirements for cotton sheeting jacket; and deletes use of brass bands and changes their width and thickness.

U. S. Gov., Navy Dept. Specification 32-I-2b; 1944. Insulation; Blanket, Mineral-Wool.

707.49 Miscellaneous Coverings for Pipes and Boilers

American Society for Testing Materials, C 196-44 T; 1944. Tentative Specification for Expanded or Exfoliated Vermiculite Thermal Insulating Cement. Covers scope, physical properties, samples and mixing, methods of testing, and rejection.

American Society for Testing Materials, C 197-44 T; 1944. Tentative Specification for Diatomaceous Silica Thermal Insulating Cement. Covers scope, physical properties, sampling and mixing, methods of testing, and rejection.

American Society for Testing Materials, ES-17; 1942. Emergency Specifications for Preformed Pipe Covering Thermal Insulation. Cover preformed (molded or laminated) thermal insulation in the form of semicylindrical pipe covering sections intended for use as an insulation on surfaces at specified temperatures.

American Society for Testing Materials, ES-18; 1942. Emergency Specifications for Preformed Block Thermal Insulation. Cover a rigid or semirigid thermal insulating material, either flat or segmental, for application as received, and excluding brick of the 9-in. series.

U. S. Gov., Federal Specification, HH-I-578; 1941. Insulation, Vermiculite; Block and Pipe—Covering (Molded). Covers four types—(I) standard thickness, pipe-covering; (II) double standard thickness, pipe-covering; (III) solid thickness, pipe-covering, and (IV) block. Expanded or exfoliated mica, long fiber asbestos and a suitable binder. Gives requirements for materials, weight, size, thickness, covering, and bands; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-I-578; 1942 use of brass bands, and changes their width and thickness.

U. S. Gov., Navy Dept. Specification 32P8; 1944. Pipe-Covering; Thermal-Insulation.

708. HEATING EQUIPMENT FOR POWER PLANTS

References.—Heating equipment, *see* 792.1.

709. INSULATION, THERMAL POWER

American Hospital Assn., 4-25. Blanket, Felt, and Loose-Fill Insulation (Vegetable or Wood-Fiber). Covers three classes—(A) flexible blanket, (B) semi-rigid felt, and (C) loose-fill.

American Society of Heating and Ventilating Engineers. Standard Test Code for Heat Transmission Through Walls, 1928. This code has not been framed for the purpose of offering detailed instructions for testing the heat transmission of building materials or for constructing testing apparatus, but rather for defining certain standards, the applications of which, it is hoped, will bring the results of different investigations into better conformity than is found at the present time. Includes definitions and formulas, conductivity of homogeneous materials, and over-all heat transmission.

U. S. Gov., Federal Specification HH-I-521b; 1937. Insulation; Bat or Strip-Form and Loose Fill. Type (I) bat or strip form, two classes—(A) light-weight, and (B) medium-weight; and (II) loose-fill form, three classes—(A) light-weight, (B) medium-weight, and (C) heavy-weight. Composed of mineral matter in fibrous form, in granular form, in nodulated fibrous form, in powdered form mixed with cellulose fiber, or in bat form. Gives requirements for materials, sulfur, oil asphalt, wax conductivity, and density; methods of sampling, inspection, and tests; requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification HH-I-556; 1941. Insulation (Glass-Fiber); Semirigid. Covers one grade and four types—(I) standard thickness, pipe covering; (II) double standard thickness, pipe covering; (III) single layer, pipe covering; and (IV) block. Gives requirements for material and workmanship, construction, weight per cubic foot, thicknesses, and finish; methods of sampling, inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification HH-I-578; 1941. Insulation, Vermiculite; Block and Pipe-Covering (Molded). Covers four types—(I) standard thickness, pipe-covering; (II) double standard thickness, pipe-covering; (III) solid thickness, pipe-covering; and (IV) block. Expanded or exfoliated mica, long fiber asbestos and a suitable binder. Gives requirements for materials, weight, size, thickness, covering, and bands; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-I-578; 1942 use of brass bands, and changes their width and thickness.

U. S. Gov., Federal Specification HH-M-61; 1934. Magnesia; Block, Cement, and Pipe-Covering (Molded).

Covers one grade and four types—(I) standard thickness, (II) double standard thickness, (III) blocks, and (IV) cement or plaster. Shall contain not less than 85 percent of pure hydrated magnesium carbonate and not less than 10 percent long-fiber asbestos. Gives requirements for weight, length, thickness, size, cotton sheeting jacket, and bands; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification, E-HH-M-61; 1942, changed requirements for cotton sheeting jacket; and deletes use of brass bands and changes their width and thickness.

U. S. Gov., Federal Specification HH-M-371; 1938. Mineral-Wool, Impregnated; Blanket, Block, and Pipe Covering, Molded, for Low Temperatures. Includes five types—(I) molded block; (II) molded sectional pipe covering, ice water thickness; (III) molded sectional pipe covering, brine thickness; (IV) molded sectional pipe covering, heavy brine thickness; and (V) felted blanket. Gives detail requirements for material, workmanship, conductivity, and density; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-M-371; 1942, substituted ordinary steel in lieu of copperized staples and copper-clad steel wire.

U. S. Gov., Federal Specification HH-P-386a; 1939. Pipe-Covering and Cement; Mineral or Rock-Wool. Covers one grade and three types—(I) molded sectional pipe covering; (II) felted blanket pipe covering; and (III) cement. Gives requirements for material and workmanship, sulfur, shot, stability, thicknesses, tolerance, and density; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-HH-P-386a; 1942, changed requirements for cotton sheeting jacket; and deletes use of brass bands and changes their width and thickness.

References.—Thermal insulating materials. *see* 296.2.

710-719 ELECTRICAL MACHINERY AND SUPPLIES

710. GENERAL ITEMS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Electrical Equipment. Include requirements for construction and installation, generation, application, distribution, control, service trial, spare parts and equipment; and tables of wires and cables, insulation thicknesses and resistance, and conductor sizes and over-current protection for a.c. motors.

American Institute of Electrical Engineers, 1; 1940. General Principles Upon Which Temperature Limits are Based in the Rating of Electrical Machinery and Apparatus. Gives basis of rating, classification of insulating materials, methods of temperature determination, limiting insulation temperatures, ambient temperature, conventional "hot-spot allowances," effects of altitude, limiting observable and preferred values of temperature rise. Appendix contains tables giving temperatures in various American cities.

American Institute of Electrical Engineers, 1B; 1944. Report on Guiding Principles for the Specification of Service Conditions in Electrical Standards. This report has been prepared as a guide to technical committees for use where standards are being prepared or revised, with the object of obtaining consistency, insofar as practicable, among the standards for various kinds of electrical equipment, which must often operate under the same service conditions. Covers usual temperature and altitude service conditions, unusual temperature and altitude service conditions, other conditions which may effect design and application, applications at altitudes greater than 3,300 ft., testing of equipment for altitudes not exceeding 3,300 ft., and testing of equipment designated for altitudes exceeding 3,300 ft.

American Institute of Electrical Engineers, 3; 1943. Standard for Guiding Principles for the Selection of Reference Values for Electrical Standards. For comparative results, it is necessary to standardize the conditions under which tests are made or to which test results are corrected. Covers temperatures, barometric pressure, altitude, relative air density, humidity, absolute humidity, relative humidity, preferred temperature values, preferred numbers, and bibliography.

American Institute of Electrical Engineers, 4; 1943. American Standards Assn., C68.1-1942. Measurement of Test Voltage in Dielectric Tests. Sets forth methods for the measurement of test voltages and wave shapes used in dielectric tests of electrical apparatus or insulating material. These tests are in three classes: 1, Puncture tests; 2, flashover tests; 3, voltage proof tests. Covers dielectric tests, voltage measurements, alternating voltage tests, direct voltage tests, surge voltage tests, and testing equipment and arrangement.

American Institute of Electrical Engineers. Standard 17gl; 1928. American Standards Assn., Z10gl-1929. Letter Symbols for Electrical Quantities.

American Institute of Electrical Engineers. Standard 17glA; 1940. Proposed Revision for Letter Symbols for Electric and Magnetic Quantities.

American Institute of Electrical Engineers, 21; 1942. American Standards Assn., C 76.1-1943. Standards for Apparatus Bushings and Test Code for Apparatus Bushings. Covers outdoor bushings for large apparatus and covers type bushings for small apparatus. Gives service conditions, definitions, rating, heating, dielectric tests, nameplate markings, and appendix covering test procedure.

American Institute of Electrical Engineers, 29; 1941. American Standards Assn., C 77.1-1943. Standard for Wet Test. For use in making high-potential wet tests on insulators, bushings, switches and related apparatus. Covers only the requirements for the spray and the correction factors to be applied to test results. The requirements for specimen mounting and the method of voltage application for any particular type of equipment are covered by the respective apparatus standards. Standards for the measurement of voltage are covered by A. I. E. E. Standard No. 4.

American Institute of Electrical Engineers, 31; 1944. Standards for Capacitance Potential Devices and Outdoor Coupling Capacitors. Covers scope, definitions and terminology, service conditions, standards for outdoor coupling capacitors, and standards for capacitance potential devices.

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. For the equipment of merchant vessels with electrical apparatus for lighting, signaling, communication, power, and propulsion, either direct current or alternating current.

American Institute of Electrical Engineers, 501; 1941. Test Code for Direct-Current Machines. Covers insulating resistance, winding resistance measurements, polarity drop and polarity of field coils, brush setting, efficiency, measurement of losses, reference conditions, schedule of losses, magnetic saturation data, telephone interference data, commutation, voltage regulations of a shunt-wound and a compound-wound generator, speed regulation of motor, load test of fractional horsepower motors, temperature test, measurement of the cooling air temperature during tests, method of determining temperature rise by resistance, shaft currents, high-potential test, noise test, and exciter response.

American Institute of Electrical Engineers, sponsor. American Standards Assn., C42-1941. American Standard Definitions of Electrical Terms. Contains definitions of technical terms used in electrical engineering, including correlation of definitions and terms in existing standards. The groups of definitions into which the standard is divided are: General (Fundamental and Derived) Terms (group 05); Control Equipment (group 25); Electric Welding and Cutting (group 50); Electrobiology, including Electrotherapeutics (group 80); Electrochemistry and Electrometallurgy (group 60); Electrocommunication (group 65); Electromechanical Applications (group 45); Electronics (group 70); Generation, Transmission and Distribution (group 35); Illuminating Engineering (group 55); Instruments, Meters and Meter Testing (group 30); Radiology (group 75); Rotating Machinery (group 10); Switching Equipment (group 20); Transformers, Regulators, Reactors, and Rectifiers (group 15); Transportation (groups 40, 41, 42); and Miscellaneous (group 95).

American Institute of Electrical Engineers, joint sponsor with American Society of Mechanical Engineers. American Standards Assn., Z32.9-1943. Assn. of American Railroads, Telegraph and Telephone Section, M-3. Graphical Electrical Symbols for Architectural Plans. This standard, which has the endorsement of the American Institute of Architects, is intended to cover the symbols used for depicting electrical equipment for buildings and are the schematics used by the architectural profession to show the locations of electrical power, light, control, and communication facilities provided for the building.

American Institute of Electrical Engineers, joint sponsor with National Electrical Mfgs. Assn. American Standards Assn., Z32.10; 1944. American Standards for Graphical Symbols for Electronic Devices. Developed to co-ordinate the various basic symbols for electronic devices. Includes types of devices covered, symbol size, new symbols, and illustrations.

American Institute of Electrical Engineers, joint sponsor with American Society of Mechanical Engineers. American Standards Assn., Z32.3-1943. Graphical Symbols for Power, Control and Measurement. Covers basic symbols which seem to have widespread use and application. Gives symbols for alarms, battery, capacitors, circuit breakers, coils, connectors, wiring, electrical contacts, fuse, indicating lights, instruments and meters, lightning arresters, rotating machines, plug connections rectifiers, relays, resistors, rheostats, switches, thermal elements, thermo-couples, and transformers.

American Mining Congress, joint sponsor with U. S. Gov., Dept. of Interior, Bureau of Mines. American Standards Assn., M2-1926. Safety Rules for Installing and Using Electrical Equipment in Coal Mines. Definitions, limitations on voltage and capacity, use of insulated platforms, grounding of frames and sheaths, guarding of circuits, installation and protection of motors and controllers, safety devices for electric hoists, construction of underground stations and switchboards, installation of lamps, requirements for portable electrical equipment, installation and protection of circuits, trolley wires, signal and telephone circuits, and shot-firing circuits.

American Mining Congress, sponsor. American Standards Assn., M-24-1932. Safety Rules for Installing and Using Electrical Equipment in Metal Mines.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 6—Electrical Measurements, 1934. Defines standard methods for electrical measurements required by the various test codes. Covers voltage, current, power, energy, resistance, frequency, power factor measurement, etc.

American Society for Testing Materials, A 34-44; 1944. Methods of Test for Magnetic Properties of Iron and Steel. Includes procedures for determining the normal induction and hysteresis, core loss, normal and incremental permeability and core loss, permeability of feebly magnetic materials, interlamination resistance, and lamination factor.

American Society for Testing Materials, A 127-44T; 1944. Tentative Definitions of Terms, With Symbols, Relating to Magnetic Testing. Gives table showing symbols used in magnetic testing and defines a large number of terms used in magnetic testing.

American Society for Testing Materials, B 110-39T; 1939. Tentative Method of Test for Dielectric Strength of Anodized Aluminum. For anodic coatings applied to aluminum and its alloys, also for measure of thickness of coating where properties are known. Requirements for high-voltage transformer, electrode, test specimens, surrounding medium, condition and position of electrodes, and application of voltage.

American Society for Testing Materials, B 155-41T; 1941. Tentative Method of Test for Temper of Strip and Sheet Metals for Electronic Devices (Spring-Back Method). Covers the procedure for determining the temper of strip and sheet metals for electronic devices, in thicknesses of 0.010 in. or less, by means of measurements of the "spring-back" when the specimen is released after bending in the prescribed manner. Apparatus, test specimen, procedure, and report.

American Society for Testing Materials, B 156-42T; 1942. Tentative Methods of Testing Lateral Wire for Grids of Electronic Devices. Cover the procedures for testing lateral wires from 0.001 to 0.010 in. in diameter, for grids of electronic devices. Chemical composition, size, and tension tests.

American Society for Testing Materials, B 157-41T; 1941. Tentative Methods of Testing Wire for Supports Used in Electronic Devices and Lamps. Cover the procedures for testing round wire (exclusive of molybdenum and tungsten) from 0.010 to 0.075 in. in diameter, used as support wire in electronic devices and lamps. Chemical composition, electrical resistivity, straightness, diameter, out-of-roundness, tension tests, and bend test.

American Standards Association, Z-32.11; 1944. Coordination of Electrical Graphical Symbols (American War Standard). This Standard for the coordination of fundamental electrical graphical symbols has for its object the coordination and simplification of basic electrical symbols now in use for power, control measurement, telephone, telegraph, and radio. Gives various illustrations.

American Transit Assn. Recommended Outlines for Power Contract, D124-37; 1937. Contract referred to in this recommendation covers details relative to general conditions, requirements of service, power supply, determination of maximum demand, rates, metering, operating arrangements, bills and payments, arbitration, and liability.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume 1. Structural Details, 1938. For buildings supporting tanks, requirements as to footings on brick supporting walls, design for anchorage, allowable bearing pressures for supports of various building materials. Concrete buildings according to A.S.T.M. specifications for concrete.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1-b-42; 1942. Form of Agreement for Purchase of Electrical Energy for Other Than Traction Purposes. Covers form of energy, point of delivery, limits of fluctuation, character of load, capacity, rates, supplying electrical energy to any consumer, prevention of use, meters, rules and regulations, liability, interference with apparatus, arbitration, access to premises, termination of agreement as applied to any point of service by loss of the railway company's plant, regulation by public utility regulatory bodies, term, and successors.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. Lubrication of Motors and Inspection and Maintenance of Electrical Equipment (6-a-41). Covers recommended electrical inspection and maintenance practices for light and power installations on railroad fixed facilities; excluding signals, communication systems and electric traction facilities. Electric light and power wiring and apparatus in tunnels, on bridges, piers, coal and ore docks, at passenger and freight facilities, pumping stations, shops, fuel stations, storage warehouses, grain elevators, pole lines, power plants, substations, turntables, ash cranes, shop machinery, etc., are included under this subject.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. Repair Shop Practice (6-b-41). Requirements for economical and prompt repairs for shops required to handle repairs to motors, generators, and other electrical equipment that has failed in service.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. Recommended Practice for the Prevention of Electric Sparks During the Transfer of Inflammable Liquids (8-a-39).

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Circuit Nomenclature and Written Circuits. Standard abbreviations for electrically operated signal units and wires, with drawings covering the standard graphical symbols.

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Div., Safety Section. Safety Rules Governing Maintenance of Equipment and Stores Employees, 1942. Gives requirements for prevention of burns (fires, explosions); handling material, tools, and equipment; operation of trucks, tractors, cranes, hoists, and derricks; working on or about machinery, engines, cars, pipe lines, refrigerating or air conditioning units, and elevators; protection against train and engine hazard; and eye protection.

Assn. of Iron and Steel Engineers. Proposed Safety Regulations When Working on High Tension Lines, 1932.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C50-1936. American Institute of Electrical Engineers Standard C50. Rotating Electrical Machinery. Definitions and requirements on direct-current rotating machines, synchronous generators, synchronous motors and synchronous machines in general, synchronous convertors, induction motors and induction machines in general, and direct-current and alternating-current fractional horsepower motors. Appendixes (I) Standard Lettering of Dimension Sheets, (II) Effects of Variation of Voltage and Frequency Upon the Performance of Induction Motors, (III) Standard Form for Making Characteristic Curves on Forms, (IV) Definitions for Brushes, (V) Insulation Resistance, and (VI) Compressor Factors.

International Assn. of Electrical Inspectors. Model Draft for an Electrical Inspection Ordinance, 1944. For safeguarding persons and property and promoting the welfare of the public. Covers scope, electrical inspector—qualifications and appointment, duties of electrical inspector, authority of electrical inspector, standards for the installation of electrical equipment, standards for electrical equipment, permits, fees for permits and inspections, inspection and certificates, connection to installations, board of review, penalties, liability for damages, validity, repeal of conflicting ordinances, and date to take effect.

National Board of Fire Underwriters. American Standards Assn., C1-1940. National Electrical Code. Definitions; wiring design, protection, methods and materials; equipment for general use; special occupancies; special equipment; special conditions; construction specifications. Fully detailed specifications for construction and for performance under test and in service of electrical equipment and materials for use under this code are given in the Standards of Underwriters' Laboratories, Inc.

National Electrical Manufacturers Assn., 42-74; 1942. Service Equipment Standards. Gives general performance, rating, marking and test standards for devices such as service entrance and meter service switches, service circuit breakers, meter test blocks and combinations of meter service switches and branch circuit fuse holders or branch circuit breakers.

National Electrical Manufacturers Assn., 43-86; 1943. Feeder Voltage Regulator Standards. This publication is a reference work of practical information concerning the manufacture, test and performance of feeder voltage regulators. Gives standards for bushing characteristics, efficiency and losses, general standards, guide for loading induction and step-voltage regulators, manufacturing standards, performance specifications, rating standards, tests, and definitions.

National Electrical Manufacturers Assn. and Edison Electric Institute. Preferred Voltage Ratings for A-C Systems and Equipment, N.E.M.A. 100; 1930. Ten tables show preferred voltage ratings for electrical equipment, generators, motors, distribution transformers, substation transformers, transformers for use with generators for supplying higher voltage systems, transformers for reversible tie purposes, and general apparatus, such as disconnecting switches, fuses, oil circuit breakers, etc.

National Electrical Manufacturers Assn., sponsor. American Standards Assn., C6.1-1944. Terminal Markings for Electrical Apparatus. The purpose of applying markings to the terminals of electric power apparatus according to a standard is to aid in making up connections to other parts of the electric power system and to avoid improper connections. Covers electric power apparatus, rotating apparatus, constant potential transformers, feeder voltage regulators, industrial control, instrument transformers, current-limiting reactors, constant-current transformers of the moving coil type, attachment plugs, and electric water heaters.

U. S. Gov., Army Air Forces. Specification 32296; 1940. Power Plant: Aircraft Accessory, Electric Model Specification (Instructions for Preparation).

U. S. Gov., Army-Navy Aeronautical Specification AN-P-6a; 1942. Power-Plant; General Specification for Electric Alternating Current.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-7a; 1942. Power-Plant; Electric Alternating Current, 60 Cycle, 3 Phase, 2,400 Volts Per Phase.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-8; 1942. Power-Plant; Electric Direct Current 9 Kilowatt, 32 Volt.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-9a; 1942. Power-Plant; Electric Direct Current, 3 Kilowatt, 110 Volt.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-10a; 1942. Power-Plant; Electric Direct Current 500 Watt, 110 Volt, Portable.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-42; 1943. Power-Plant; Electric Alternating Current 10 Kilowatt Single Phase 32/120/240 Volt.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C415; 1937. Magnetic Testing. This circular gives general information regarding magnetic quantities, the magnetic characteristics of materials, the principles employed in magnetic testing apparatus, and a brief discussion of the theory and application of magnetic analysis.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H4; 1928. Discussion of the National Electrical Safety Code (To Accompany the Fourth Edition of the Code). A handbook, to be used in conjunction with the fourth edition of the National Electrical Safety Code, discussing the rules of the safety code and the method of their application.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. They also apply to similar equipment if installed in factories, mercantile establishments, vehicles or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. Rules covering protective arrangements of stations and substations, protective arrangements of equipment, requirements on rotating equipment, storage batteries, transformers, induction regulators, rheostats. ground directors, conductors, fuses, circuit-breakers, switches, controllers, switchboards and lightning arrestors.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H32; 1941. American Standards Assn., C2.2-1941. Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines. Comprising part 2 of the fifth edition, National Electrical Safety Code. Rules covering general requirements applying to overhead and underground lines including design and construction, installation and maintenance, accessibility, inspection and test of lines and equipment, isolation and guarding, grounding of circuits and equipment, and arrangement of switches; rules for overhead lines including relations between various classes of lines, clearances, grades of construction, loading for grades A, B, C, D, and E, strength requirements, line insulators, and miscellaneous requirements;

rules for underground lines including location of duct systems and manholes, construction of duct systems, construction and location of manholes, location of conductors, protection of conductors in duct systems and manholes, guarding of live parts in manholes, construction at risers from underground, identification of conductors, and identification of apparatus connected in multiple; and appendixes covering—(A) recommended normal sags of copper overhead line conductors, with corresponding tensions and stresses; (B) minimum permissible sags for line conductors of grades A, B, and C, and corresponding tensions; (C) sags for line conductors strung to the 3,000-lb. limitation; (D) mechanical data for copper, steel, copper-covered steel, and aluminum wires and cables; (E) loads upon conductors and supports; (F) wood poles; and (G) definition of American Society for Testing Materials of dense Southern yellow pine.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment. Comprising part 3 and the grounding rules of the fifth edition, National Electrical Safety Code. For 25- to 750-volt equipment which is accessible to other than qualified electrical operators, rules on installation, grounding, protection, provision of guards, etc., for conductors, fuses, circuit-breakers, switches, controllers, switchboards, motors, electric furnaces, fixtures and signs, portable devices, electric locomotives and cranes, telephone apparatus exposed to supply lines, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H34; 1938. American Standards Assn., C2.4-1939. Safety Rules for the Operation of Electric Equipment and Lines. Comprising part 4 of the fifth edition, National Electrical Safety Code. This part of the code deals with rules for the operation of electric equipment and lines. It includes definitions and safety rules for the protection of employers and for employees working on supply and communication systems.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H36; 1940. Safety Rules for Electric Fences. Comprising part 6 of the fifth edition, National Electrical Safety Code. These rules apply to the installation, use, and identification of electric fences and to the construction and characteristics of the controllers used with them and through which electric energy is delivered to the fence. These rules cover identification of fence wire; conditions of use; types, output, and construction of controlling devices, and dielectric and leakage tests.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H39; 1944. National Electrical Safety Code; Part 2 and Grounding Rules. Discusses rules covering methods of protective grounding of overhead and underground lines and related equipment and safety rules for the installation and maintenance of electric supply and communication lines.

U. S. Gov., Navy Dept. Specification 17E12b; 1944. Electrical-Equipment, Explosion-Proof; Basic Requirements for.

U. S. Gov., Navy Dept. Specification 17E15; 1944. Electrical-Equipment: Rotation, Connections, and Terminal Markings.

References.—Protection of electrical circuits and equipment against lightning, *see* 715.50, 715.51; ground clamps, *see* 719.72; Tolerances for metal fits, *see* 615.82.

711. ELECTRIC GENERATORS AND MOTORS

711.1 ELECTRIC GENERATORS

711.10 General Items

American Institute of Electrical Engineers, sponsor, 11; 1937. American Standards Assn., C35-1936. Tentative Standards for Railway Motors and Other Rotating Electrical Machinery in Rail Cars and Locomotives. Definitions, classification, rating, and methods of test for rotating electrical machinery forming a part of the power equipment of electrically propelled railway cars and locomotives. Machines are classified as railway motors, auxiliary motors, generators, auxiliary generators and dynamotors, motors, and phase convertors.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume 1. Structural Details; 1938. For buildings supporting tanks, requirements as to footings on brick supporting walls, design for anchorage, allowable bearing pressures for supports of various building materials.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C50-1943. Rotating Electrical Machinery. Covers definitions, direct-current rotating machines, synchronous generators, synchronous motors, synchronous machines in general, synchronous convertors, induction motors and induction machines in general, direct-current and alternating-current fractional horsepower motors, and appendices.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Generators. Requirements on protection of terminals and live parts, location of generator, permissible types and arrangement of excessive current protective devices, grounding requirements.

National Electrical Manufacturers Assn. Motor and Generator Standards, 41-64; 1941. Gives basic standards for design and construction, on ratings which set up horse power, kilowatt and voltage ratings for each class of motor and generator, performance specification forms for generators and motors, test forms for polyphase induction motors and direct-current motors, also motor dimension standards for various kinds of motors, and definitions of terms.

Underwriters' Laboratories, Inc. Standard for Electric Motors and Generators for Use in Hazardous Locations; Class I, Group D—Part I, Integral Horsepower Motors, 1943. Applies to electric motors for use in class I locations as defined in article 500, section 5,005 of the 1940 edition of the National Electrical Code. Covers requirements for casing, provision for connection to supply line, fans on totally enclosed fan-cooled motors, plugs in enclosures, marking, tests, inspection of listed product, description of label service, cost of service, and instructions to inspectors.

Underwriters' Laboratories, Inc. Standard for Electric Motors and Generators for Use in Hazardous Locations; Class I, Group D—Part II, Fractional Horsepower Motors, 1941. Applies to electric motors for use in class I locations as defined in article 500, section 5005 of the 1940 edition of the National Electrical Code. Casing, provision for connection to supply line, fans on totally enclosed fan-cooled motors, plugs in enclosures, marking, tests, and inspection of listed products.

Underwriters' Laboratories, Inc. Standard for Electric Motors and Generators for Use in Atmospheres of Combustible Dust; Class II, Groups F and G, 1943. Applies to electric motors for use in class II locations as defined in article 500, section 5006 of the 1940 edition of the National Electrical Code. Groups F and G casing, leads and connections, provision for connection to supply line, fans on fan-ventilated motors, marking, tests, inspection of listed product, description of label service, cost of service, and instructions to inspectors.

U. S. Gov., Dept. of Commerce. Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-162. Engine-Generator; Diesel, 240-V., 25-KVA.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-178. Engine-Generators; Gasoline, 18.75- and 10-KVA.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-242. Generator; UHF Standard Signal.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-268. Engine-Generator; Gasoline, 12.5-KVA.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-280. Frequency, Radio, Generator for Testing.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-326. Engine-Generator; Gasoline, 350 Watts, Air-Cooled, Portable.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-400. Engine-Generator; 125-KVA Multiple Cylinder, Gasoline, 240-V., 60-Cycle, 3-Phase.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-403. Engine-Generator; 50-KVA, 240-V., 60-Cycle, 3-Phase, 80-Power Factor.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-411. Engine-Generator; 12.5-KVA Duplex for Radio Standby Power, Installation of.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-430. Engine and Generator Variable Compression Test Set.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-462. Engine-Generator; Gasoline, 5-KVA, 120-V.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-463. Engine-Generator; Gasoline, 1.5-KVA, 120-V.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-479. A.C. Generating Plant; Engine-Driven 220-V., 60-Cycle, Single-Phase, 18.75-KVA.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-503. Engine-Generator; 12.5-KVA in Alaska Buildings (Tentative).

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for The Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. They also apply to similar equipment if installed in factories, mercantile establishments, vehicles or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. For rotating equipment (sec. 12), requirements on speed control, stopping devices, guards for live parts, grounding machine frames, terminal bases and bushings, and deteriorating agencies.

U. S. Gov., Navy Dept. Specification 17C9c; 1942. Conditioning-Devices, Commutator and Slipring.

711.11 Alternating Current Generators

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Alternating Current Generating Sets Covers installation and location, number and size, exciters, emergency sets, voltage regulators, windings, prime movers, mountings, insulation, lubrications, corrosion resistant parts, terminal arrangements, tests, temperature limits, spare parts, etc.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C50-1943. Rotating Electrical Machinery. Covers definitions, direct-current rotating machines, synchronous generators, synchronous motors, synchronous machines in general, synchronous convertors, induction motors and induction machines in general, direct-current and alternating-current fractional horsepower motors, and appendices.

National Electrical Manufacturers Assn. Motor and Generator Standards, 41-64; 1941. Synchronous Generators. (Exclusive of turbo-generators, single phase synchronous, inductor synchronous or induction generators.) Gives standard basis or rating, 25, 50, and 60 cycle frequencies, performance standards, and recommended output and speed ratings for engine type generators, and manufacturing standards.

U. S. Gov., Army Air Forces. Specification 32458; 1944. Power Plant; Diesel-Engine-Driven Electric, Type F-1.

U. S. Gov., Army Air Forces. Specification 32459; 1944. Power Plant; Diesel-Engine-Driven Electric, Type F-2.

U. S. Gov., Army Air Forces. Specification 32460; 1944. Power Plant; Diesel-Engine-Driven Electric, Type F-3.

U. S. Gov., Army Air Forces. Specification 32469 (4); 1944. Power Plant; Diesel-Engine-Driven Electric, General Specification for.

U. S. Gov., Army Air Forces. Specification 32478; 1944. Generator; Engine-Driven, Type V-1, Alternating Current.

U. S. Gov., Army Air Forces. Specification 32509; 1944. Alternator; Engine-Driven, Type A-1, Aircraft.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 153. Generator; Portable, a.c.

U. S. Gov., Treasury Dept., Procurement Div., 613; 1943. Generating Sets; Diesel-Engine-Driven, Trailer-Mounted. Gives requirements for type, rating and capacities, material, workmanship, general design, mountings, duty rating, tools, instruction manuals, and details; methods of inspection, and tests; and packing and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32287-A; 1941. Plant; Power, Electric; Electric, Type C-9 (1,500 Watt).

U. S. Gov., U. S. Army, Medical Department. Specification 10-2972B; 1941. Power Plant; Electric, Gasoline, Portable.

U. S. Gov., U. S. Army, Ordnance Department. Specification 89-2300; 1939. Power Plant; Diesel-Engine-Driven, 5 kva.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-506D; 1940. Generator GN-35; Hand-Driven, Double Voltage.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-706B; 1944. Generator GN-41; Hand.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-865; 1938. Power Unit; Type PE-60-( ); Gasoline-Engine-Driven, 2 kva., Dual Voltage.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-912A; 1941. Power Unit; Types PE-52-( ) and PE-53-( ), 3 Kilovolt Amperes, Gasoline-Engine-Driven Generator.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-951A; 1938. Power Unit; Type PE-56-( ), Gasoline-Engine-Driven, for Radio Sets.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-952A; 1942. Power Unit; Type PE-75-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-962A; 1942. Power Equipment, for Radio Set SCR-197-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1038A; 1943. Power Unit PE-77-( )'43.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1061; 1942. Power Unit PE-95-( ); 5 kw Gasoline-Electric Power Unit,

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1083; 1942. Power Unit PE-99-( ); 120-Volt, 60-Cycle, 3-Phase, 7.5-kva., Gasoline-Driven Special Application Feature; Not General Purpose Power Unit.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1357; 1942. Generator GN-44-( ); Hand-Driven, Double Voltage.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3016; 1944. Power Unit PE-197-(5 KW Gasoline-Electric Power Unit).

U. S. Gov., Veterans Administration. Specification VA-X-107-B; 1941. Low Voltage Sine Wave and Galvanic Generator.

References.—Protection requirements, *see* 711.10; definitions, symbols, voltage and frequency standards, methods of test, safety codes, *see* 710; cast iron, forged steel, shafts, *see* 611.11, 611.51, 611.52; plain bearings, ball and roller bearings, *see* 692.3, 766.2; copper wire, *see* 715.44; couplings, *see* 706.3.

711.12 Direct Current Generators

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Direct Current Generating Sets. Covers installation and location, number and size, emergency sets, windings, voltage regulation and compounding, parallel operation, prime movers, mountings, lubrication, corrosion resistant parts, terminal arrangements, tests, temperature limits, sparking, insulation, etc.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1939. Axle Generator Equipment. Gives requirements for capacity, general construction, armature, bearings, leads, high-speed and insulation tests, suspension, terminal block, regulator, reverse current relay, and dimensional diagrams.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice. 1941. Turbo-Generator. Gives capacity of 500 watts or larger for locomotive lighting; steam pressure, general construction requirements, bearings and lubrication, location, and maintenance.

Assn. of Iron and Steel Engineers. D-C Mill Motor Standards, 1940. Gives details for enclosed direct current mill motors, protected self-ventilated direct current mill motors, enclosed direct current adjustable speed mill motors, and enclosed forced ventilated direct current mill motors; standardized short mill motor dimensions; and standardized short mill motor back axle details.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C50-1943. Rotating Electrical Machinery. Covers definitions, direct-current rotating machines, synchronous generators, synchronous motors, synchronous machines in general, synchronous convertors, induction motors and induction machines in general, direct-current and alternating-current fractional horsepower motors, and appendices.

National Electrical Manufacturers Assn. Motor and Generator Standards 41-64; 1941. Generators; Direct Current. Includes generators built in frames of one horsepower, 1,750 rpm up to frames corresponding to 150 kw, at 450 rpm; also large 200 to 2,500 kw, rating standards, performance, and manufacture.

National Electrical Manufacturers Assn. Motor and Generator Standards 41-64; 1941. Isolated Electric Farm Lighting Plants. Covers plants which furnish power from generator, and generator-battery systems, 32, 64, and 112 volt systems, 500 to 5,000 watts output, basis of rating, performance standards, and manufacture. The Society of Automotive Engineers cooperated with the N.E.M.A. in the preparation of these standards.

National Electrical Manufacturers Assn. Turbine-Generator Recommended Practices 41-66; 1941. Covers direct connected sets and 25 cycle and direct-current geared sets in types and sizes in current use. Includes requirements for turbine units; synchronous generators for steam turbine drive; and direct-current generators for steam turbine drive.

U.S. Gov., Army Air Forces. Specification 32397-A-1; 1944. Plant; Electric Power, Type C-13A (Gasoline-Engine-Driven, Portable).

U. S. Gov., Army-Navy Aeronautical Specification AN-G-1; 1943. Generators; Engine-Driven Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-32275; 1941. Generator; Engine-Driven, Type P-1 (Aircraft—24 Volts D.C.).

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-32283-A; 1943. Generator; Engine-Driven, Type 0-2 (Aircraft—24 Volts. D.C.).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-46-C; 1927. Motor Generator; Type GN-29-A, Component of Radio Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-402B; 1930. Power Unit; Type PE-( ) 41 Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-466B; 1931. Power Unit; Type PE-( )-40, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-620-B; 1944. Generator GN-37-A; Hand-Driven.

U.S. Gov., U.S. Army, Signal Corps. Specification 71-688C; 1942. Power Unit, Type PE-49-( ); Gasoline-Engine-Driven, for Radio Sets and Motors, Types MO-7-( ) and MO-9-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-865; 1938. Power Unit; Type PE-60-( ), Gasoline-Engine-Driven, 2 kva., Dual Voltage.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1130; 1942. Power Unit; PE-90-( ), Dual Voltage, Gasoline-Engine or Electrical-Motor Driven.

References.—Generators for arc welding, *see* 767; protection requirements, *see* 711.10; synchronous converters, *see* 713.2; definitions, symbols, voltage standards, methods of test, safety codes, *see* 710; automobile generator mountings, *see* 722.32; cast iron, forged steel, shafts, *see* 611.11, 611.51, 611.52; plain bearings, ball and roller bearings, *see* 692.3, 766.2; copper wire, *see* 715.44; airplane generator mountings, *see* 724.21.

711.2 ELECTRIC MOTORS

711.20 General Items

American Institute of Electrical Engineers, sponsor, 11; 1937. American Standards Assn., C35-1936. Tentative Standards for Railway Motors and Other Rotating Electrical Machinery in Rail Cars and Locomotives. Definitions, classification, rating and methods of test for rotating electrical machinery forming a part of the power equipment of electrically propelled railway cars and locomotives. Machines are classified as railway motors, auxiliary motors, generators, auxiliary generators and dynamotors, motors, and phase convertors.

American Institute of Electrical Engineers, 500; 1937. Test Code for Polyphase Induction Machines.

American Transit Assn. Recommended Practice for Repair of Armature and Field Coils, E134-39; 1939. Gives recommendation as to the care should be exercised in repairing armature and field coils against any defect that may cause failure.

American Transit Assn. Recommended Practice for Construction and Repair of Commutators, E135-37; 1937. Gives recommendations as to the method of constructing and repairing commutators.

American Transit Assn. Recommended Practice for Armature and Axle Liners, E138-37; 1937. Chemical composition of bronze shells and babbitt metal for armature bearings, recommended clearance for armature and axle bearings and detailed approved method for making babbitt bearings.

American Transit Assn. Recommended Practice for Motor Leads, E140-39; 1939. Recommendations as to the type of cables to be used in connection with the various horsepower motors, marking of motor leads, the use of connectors, and supports.

Assn. of American Railroads, Mechanical Division, Electrical Section. Manual of Standard and Recommended Practice, 1941. Motors and Controls. Gives general factors to consider in selecting motors and controls such as available power supply, surrounding atmosphere, starting, running, and load conditions, code and utility requirements, mechanical features, automatic, hand, and remote control. Includes tables of power requirements for various machine tools, woodworking tools, and types of motors for various load applications. National Electrical Manufacturers' Association standards for motors and control are recommended.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. Motor Characteristics (6-c-41). Covers alternating current commercial motors—squirrel cage induction motors (N.E.M.A. classes A, B, C, D, E, F, and multi-speed-pole changing type), wound rotor induction, synchronous, single-phase, and special A.C. motors; and direct-current commercial electric motors—shunt, series, and compound wound.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C50-1943. Rotating Electrical Machinery. Covers definitions, direct-current rotating machines, synchronous generators, synchronous motors, synchronous machines in general, synchronous convertors, induction motors and induction machines in general, direct-current and alternating-current fractional horsepower motors. and appendices.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Motors. Protection of terminals and live parts, requirements on type, location and rating of disconnecting means, general requirements on acceptable types of controllers.

National Electrical Manufacturers Assn. Motor and Generator Standards, 41-64; 1941. Application and selection of rotating apparatus conditions of operation, short-time rated machines, speed limitations, general-purpose motors, manufacturing practice, frame numbering standard dimensions, connections and terminal markings, small universal motors, small d-c and a-c. motors, large d-c, single-phase, and polyphase motors, synchronous motors, elevator motors, crane motors, buffer and grinder motors rating, performance, manufacture, and commercial standards.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. They also apply to similar equipment if installed in factories, mercantile establishments, vehicles or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. For rotating equipment (sec. 12), requirements on speed control, stopping devices, guards for live parts, grounding machine frames, terminal bases and bushings, and deteriorating agencies.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment. Comprising part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators; and the grounding rules of the fifth edition, National Electrical Safety Code. For electric motors (sec. 34), requirements on control devices, deteriorating agencies, guards for live parts, grounding machine frames, and protecting moving parts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R145-33; 1933. Packaging of Electric Railway Motor and Controller Parts. This recommendation establishes a schedule for packaging of motor and controller parts. It gives in detail the number of units per package of items relating to motor and controller parts. Sponsored by American Transit Engineering Association.

U. S. Gov., Navy Dept. Bureau of Yards and Docks. Specification 16Ye; 1941. Refrigerating Equipment. Includes ice-making equipment—requirements for electric motors, control equipment, and wiring.

711.21 Alternating-Current Motors

American Institute of Electrical Engineers. Recommended Practice of Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. (1) Alternating Current Motors. All motors should be designed for the voltage, phase, and frequency of the supply system. Covers installation and location, accessibility, insulation and winding, lubrication, corrosion resistant parts, tests, temperature rises, and spare parts. (2) Propulsion Equipment. Includes turbines for electric drive, Diesel engines, a.c. generators and motors for propulsion, exciters, control equipment, temperature limits, tests, cables, installation, operation, and maintenance.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C50-1943. Rotating Electrical Machinery. Covers definitions, direct-current rotating machines, synchronous generators, synchronous motors, synchronous machines in general, synchronous convertors, induction motors and induction machines in general, direct-current and alternating-current fractional horsepower motors, and appendices.

National Electrical Manufacturers Assn. Motor and Generator Standards, 41-64; 1941. Alternating Current Motors. Includes standards for small power motors, large single-phase and polyphase induction, synchronous, polyphase for elevator, crane, buffer and grinder motors, standard voltage and frequency ratings, permissible temperature rise, efficiency tables, torque characteristics, dielectric and commerical tests, standard dimension, etc.

U. S. Gov., Federal Specification CC-M-636; 1941. Amendment 1; 1944. Motors; Alternating Current, Fractional-Horsepower, Single-Phase and Universal. Gives types, enclosures, and duty classifications; general requirements for voltage and frequency ratings, speed, ambient temperature of reference, electrical insulation, use, suitability, allowable variations from rated voltage and from rated frequency, noise, balance, torque, dielectric strength, insulation resistance, general construction, enclosing covers, feet, drain plugs, shafts, lubrication, bearings, laminated cores, commutators, slip rings, brushes, connection, terminals, leads, horsepower rating, speeds, efficiencies, and power factors; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification CC-M-641; 1943. Amendment 1; 1944. Motors; Alternating-Current, Integral-Horse-Power. Covers single phase and polyphase types. Gives requirements for material and workmanship, voltage rating, electrical insulation, dielectric test, methods of measuring temperature, general construction, bearings, connections and terminals, horsepower rating, speed, shaft extensions, dimensions, and torque characteristics; methods of sampling, inspection and test; and packing and marking.

U. S. Gov., Navy Dept. Specification 17M10a; 1939. Motors, Alternating-Current (Shipboard Use).

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Electric Motors, 1943. Squirrel-cage induction type, 2 h.p., 1,500 r.p.m., 220 volt, constant speed, 3-phase, 3-wire, 25 cycle.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Motors, 1943. Capacitor type induction, 230 volt, 25 cycle, single-phase, 1,500 r.p.m., open type; for refrigerator use.

U.S. Gov., Panama Canal, Purchasing Dept. Specification for Repulsion-Induction Type Electric Motors, 1940.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1130; 1942. Power Unit; PE-90-( ), Dual Voltage, Gasoline-Engine or Electric-Motor Driven.

References.—Motors for railway signals, *see* 718.41; motors for hazardous locations, *see* 711.25; railway motors, *see* 711.3; definitions, symbols, voltage and frequency standards, rating standards, classification, methods of test, protection, safety codes, *see* 710, 711.20; electric tools, *see* 711.24; brushes, *see* 711.42; synchronous converters, *see* 713.2; impregnation of windings, *see* 719.57, 719.59; cast iron, forged steel, shafts, *see* 611.11, 611.51, 611.52; plain bearings, ball and roller bearings, *see* 692.3, 766.2; copper wire, *see* 715.44.

711.22 Direct-Current Motors

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on

Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. (1) Direct Current Motors. Provides for use of 230 volt motors, except for limited use; waterproof and enclosed ventilated motor application, insulation, windings, lubrication, terminal arrangements, corrosion resistant parts, tests, temperature limits, sparking, and spare parts. Applications as windlass, capstan, winch, steering gear, ventilating, engine room auxiliaries, pumps, etc. (2) Propulsion Equipment. Includes turbines for electric drive, Diesel engines, direct-current generators and motors for propulsion, exciters, control equipment, temperature limits, tests, cables, installation, operation, and maintenance.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C50-1943. Rotating Electrical Machinery. Covers definitions, direct-current rotating machines, synchronous generators, synchronous motors, synchronous machines in general, synchronous convertors, induction motors and induction machines in general, direct-current and alternating-current fractional horsepower motors, and appendices.

National Electrical Manufacturers Assn. Motor and Generator Standards, 41-64; 1941. Direct Current Motors. Includes standards for small motors, large motors to 200 horsepower, elevator motors; classification, rating standards, performance, manufacturer, and commercial standards.

U. S. Gov., Army Air Forces. Specification 32503; 1944. Motor; 24 Volts, D.C., Electric, Aircraft—for Radar Dome.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-10; 1943. Motors; Aircraft Direct Current 24 Volt.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-19-1; 1945. Motors; Caging, for Gyro Flux Gate Compass.

U. S. Gov., Navy Dept. Specification 17M9d; 1938. Motors, Direct-Current, for Shipboard Auxiliaries; and Controllers.

U. S. Gov., Navy Dept. Specification 17M14a; 1944. Motors; Direct-Current, for Shipboard and Motorboat Diesel Engine Starting.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Motors, 1944. Direct Current, constant speed, compound wound, belt-tightener base, 115 volt, 1,725 r.p.m.

References.—Motors for railway signals, *see* 718.41; motors for hazardous locations, *see* 711.25; railway motors, *see* 711.3; definitions, symbols, voltage and rating standards, classification, methods of test, protection, safety codes, *see* 710, 711.20; brushes, *see* 711.42; motor driven portable tools, *see* 711.24; automobile starting motor mountings, *see* 722.32; airplane starting motor mountings, *see* 724.21; cast iron, forged steel, shafts, *see* 611.11, 611.51, 611.52; impregnation of windings, *see* 719.57, 719.59; plain bearings, ball and roller bearings, *see* 692.3, 766.2; copper wire, *see* 715.44.

711.23 Motor-Driven Fans and Blowers

American Hospital Assn., 19-1. Electric Fans; Bracket and Desk Types, Rigid Blades (for Shore Use). Based on U. S. Gov., Federal Specifications W-F-101a. Amendment 1. Fans; Electric.

National Electrical Manufacturers Assn. Fan Standards, 44-95; 1944. Provides practical information concerning test, rating, performance and manufacture of alternating-current and direct-current electric fans of the desk and bracket type, pedestal type, ceiling type, ventilating type (made from desk or bracket fan parts) and air circulators. Gives requirements for fan standards, performance standards, and manufacturing practice.

Underwriters' Laboratories, Inc. Standard for Motor-Operated Fans, 1938. Covers portable and stationary motor-operated fans of the desk and bracket types and adaptations of such fans for ventilating purposes; and ceiling, pedestal, and air-circulator types for indoor use and designed to be operated from circuits involving potentials of not more than 600 volts in accordance with the National Electrical Code. General, frame and enclosure, mechanical assembly, corrosion protection, supply connections, current carrying parts, wiring, insulating material, motors, spacings, grounding, power input, temperature, dielectric strength, insulation resistance, rating, marking, and inspection of listed product.

U. S. Gov., Federal Specification W-F-101a; 1930. Amendment 1; 1941. Fans, Electric; Bracket and Desk-Types, Rigid-Blades (for Shore Use). Covers fans with blades of diameters 8 to 9, 10, 12, and 16 in. Detail requirement as covered by Underwriters' Laboratories Standard for Motor-Operated Fans. Gives methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-W-F-101a; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed detail requirements and requirements for blade sizes.

U. S. Gov., Joint Army-Navy Specification JAN-F-68; 1944. Fans; Electric, Bracket (Shipboard Use).

U. S. Gov., Joint Army-Navy Specification JAN-F-151; 1944. Fans; Electric, Refrigerator-Space, Shipboard Use.

U. S. Gov., Treasury Dept., Procurement Div., 423C; 1942. Fans; Electric, Ceiling, Rigid Blades. Covers 2 types—(I) reversible ceiling fan, and (II) uni-directional ceiling fan, either 36 or 52 in. in diameter. Gives requirements for condition, number of blades, kind of blades, operating voltage, lubrication, bearings, brush holders, capacity, regulating switch, lighting fixtures, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U.S. Maritime Commission. Specification 17-MC-5a; 1944. Fans, Marine; Rigid-Blades, Bracket Mounting, Direct Current, Emergency Type. Gives requirements for type, sizes, materials, workmanship, mounting, oscillating mechanism, blades, guard, speed regulation, balance, motor, commutator, brushes, brush holders, dielectric strength, insulation resistance, spacing, bearings and lubrication, regulation switch, speed control element, cord and plug, finish, and detail requirements; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 17-MC-8a; 1944. Fans, Marine; Rigid-Blades, Bracket Mounting, Alternating Current, 60 Cycles, Emergency Type. Gives requirements for type, sizes, materials, workmanship, mounting, oscillating mechanism, blades, guard, speed regulation, balance, motor, dielectric strength, insulation resistance, spacing,

bearings and lubrication, regulation switch, speed control element, life, oscillator cord, cord and plug, finish, and details; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

References.— Fractional horsepower motors, *see* 711.21, 711.22; methods of testing, *see* 710, 711.20; brushes, *see* 711.42; fans and blowers, *see* 791.1; d.c. motors for ventilating fans, *see* 711.22.

711.24 Electric Tools

American Standards Assn., C 74-1942. Machine Tool Electrical Standards (American War Standard). Covers power driven, complete metal working machines not portable by hand, having one or more tool and work holding devices, used for progressively removing metal in the form of chips. Gives diagrams, control, motors, wiring, grounding, electrical accessories, and standard wiring diagram symbols.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Commercial Standard CS93-41; 1941. Portable Electric Drills (Exclusive of High Frequency). This standard provides minimum specifications for class A, heavy-duty; and class B, standard, rotary electric drills manufactured in 11 standard sizes ranging from 3/16 in. to 1 1/2 in. It covers design, construction, minimum full-load ampere rating for each class and size of drill; tests name-plates; and a uniform method of certifying compliance with the standards. Sponsored by Electric Tool Institute.

U. S. Gov., Federal Specification W-D-661; 1942. Amendment 1; 1944. Drills; Electric, Portable (Exclusive of High-Frequency Types). Covers four types—(I) for aluminum, (II) for corrosion-resistant steels, (III) for mild steels and various metals other than corrosion resistant steels, and (IV) portable radial drill. Type III includes three classes, (A) heavy, (B) standard, and (C) light. Gives requirements for construction, safety, motors, screws, bolts, nuts, bearings, gears and shafts, lubrication, wiring cord and attachment plug, switch, chuck, dielectric strength, and name plate; detail requirements for each type; methods of inspection and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification W-G-656; 1937. Amendment 2; 1944. Grinders; Bench, Electric. Gives requirements for construction, interchangeability, voltage and current, motor, switch, cord, grinding wheels, length of spindle thread, grinder base, guards, work rests, marking, and sizes and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U.S. Gov., Federal Specification W-G-663; 1943. Amendment 1; 1944. Grinders; Electric, Portable. Covers one type, one grade, and three sizes—No. 4, up to 4 in. diameter grinding wheel; No. 5, up to 5 in. diameter grinding wheel; and No. 6, up to 6 in. diameter grinding wheel. Gives requirements for material, construction, voltage, horsepower, speed, efficiency, length, weight, safe operation, motors, bearings, gears and shafts, grinding wheels, guards, handle, control, cable, dielectric strength, and spare parts; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification W-M-46a; 1941. Amendment 1; 1944. Machines, Floor-polishing and Scrubbing; Electric. Covers three types; (1) Polishing; (II) polishing and scrubbing, in three classes—(A) concentrated weight, single brush; (B) concentrated weight, two brush; and (C) divided weight; and (III) polishing, scrubbing and water-absorbing. Gives requirements for material, workmanship, construction, motor, motor bearing, switch, cord handle, mounting, brushes, frame, bumper, drives, lubrication, feed line and water tank, exposed parts, marking and detail requirements for each type; methods of sampling, inspection and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification 00-H-103; 1943. Amendment 1; 1944. Hammers; Electric, Portable. Covers two types—(I) universal current operation, and (II) alternating current operation only; three sizes, (No. 1/2) 1/2-in. capacity, (No. 1) 1-in. capacity, and (No. 1 1/2) 1 1/2 in. capacity; and one grade. Gives requirements for general construction, motivation, voltage, capacity, weight and length, safe operation, and detail requirements; methods of sampling, inspection, and tests; and packaging, packing and marking.

U. S. Gov., Federal Specification 00-S-101; 1943. Amendment 1; 1944. Sanders, Portable; Belt, Disk, and Oscillating. Covers one grade and four types—(I) belt sanders, electric; (II) disk sanders, electric; (III) oscillating sanders, electric; and (IIIa) oscillating sanders, pneumatic; and various sizes. Gives requirements for general construction, voltage, air pressure, horsepower, speed, weight, safe operation, motors, bearings, gears and shafts, spare parts, accessories, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 40D1c; 1944. Drills; Radial, Motor-Driven (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40D2b; 1942. Drills; Floor-Type, Sensitive, Motor-Driven, 16-Inch (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40D3d; 1942. Drills, Bench-Type, Sensitive, Motor-Driven (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40D4d; 1944. Drills; Upright, Motor-Driven, 21-Inch (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40D5e; 1944. Drills, Upright, Motor-Driven, 28-Inch (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40D6; 1941. Drills (Machines), Radial, Motor-driven, Light-Duty and Heavy-Duty (Shore Use).

U. S. Gov., Navy Dept. Specification 40G2e; 1944. Grinders; Floor-Type, Combined-Wet-and-Dry, Double-Wheel, Motor-Driven (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40G3c; 1944. Grinders; Drill, Floor-Type, Motor-Driven (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40G4c; 1944. Grinders, Tool-and-Cutter, Universal, Motor-Driven (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40S2d; 1944. Saws; Hack, Power, Motor-Driven (Shipboard Use).

U. S. Gov., Navy Dept. Specification 40T3e; 1933. Tools, Electric, Portable Drills, Grinders, and Hammers (Exclusive of High-Frequency Tools).

U. S. Gov., Navy Dept. Specification 40T6b; 1935. Tools, Woodworking (Shipboard Use).

U. S. Gov., Treasury Dept., Procurement Div., 229; 1943. Polishers; Electric, Portable. Shall be on one type first class in every respect. Gives requirements for construction, interchangeability, motor, motor bearings, switch, cord, drive, gears, disk, equipment; methods of sampling, inspection and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 230A; 1942. Valve-Refacers; Electric, Portable. Shall be furnished in one type, and first class in every respect. Gives requirements for construction, interchangeability, voltage and current, motor, motor bearings, switch, bearings, clutch, size and dimensions, attachments; methods of sampling, inspection and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 349A; 1942. Grinders; Valve-Seat, Engine (Motor-Vehicle). Covers requirements for valve-seat grinder kits: Gives requirements for condition and interchangeability, grinding percision, grinding wheels, dielectric strength, lubrication, driver, motor, switch, cord with plug, handle, and pilots; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 415D; 1942. Cloth Cutting Machines. Covers 4 types of machines having either rotary or round knife, or straight knives. Gives requirements for machine, handle assembly, base, ball bearings, light fixture, cord with plug, motors, and dielectric strength; method of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Treasury Dept., Procurement Div., 451B; 1942. Drills; Cloth, Electric. Covers 2 types—(I) for light and medium heavy materials, and (II) for use on heavy and extra heavy materials. Gives requirements for drilling machine, handle assembly, base plate frame and housing, cord and plug, switch, motors, and drill accessories; methods of sampling, inspection, and tests; and packaging and marking.

U. S. Gov., Treasury Dept., Procurement Div., 495; 1941. Pots; Glue, Electric. Covers two types—(I) dry type with automatic temperature control, and (II) water-jacketed type with automatic temperature control; and three sizes—one quart, two quarts, and four quarts. Suitable for operation on direct and alternating 115 and 230 volt current. Gives requirements for inner pot, heater housing, flexible cable, thermostat, construction, heating elements, and temperature control; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 39-5; 1943. Cutter; Cloth, Rotary, Electric-Operated, 110-Volt, 60-Cycle, a.c.

U. S. Gov., U. S. Maritime Commission. Specification 40-MC-1a; 1942. Drills; Electric, Portable. Shall be of the single-speed, utility type, and shall be but one grade. Gives requirements for sizes, materials, workmanship, aluminum alloys, phenolic material, threaded parts, nuts, screws, bolts, locking device, motor, gears and shafts, lubrication, handles, switch, inspection, sampling, and method of test.

U. S. Gov., U. S. Maritime Commission. Specification 40-MC-2; 1942. Grinders; Electric, Portable. Shall be of the single-speed, general-purpose type, and shall be but one grade. Gives requirements for sizes, materials, workmanship, aluminum, phenolic material, threaded parts, nuts, screws, bolts, locking device, motor, gears and shafts, lubrication, handle, speeds, inspection, sampling, and method of test.

U. S. Gov., Veterans Administration. Specification VA-M-52a; 1927. Hack Saw; Power.

U. S. Gov., Veterans Administration. Specification VA-M-201; 1936. Hammer; Electric, Portable.

U. S. Gov., Veterans Administration. Specification VA-M-215a; 1936. Grinder; Tool, Electric.

References.—Fractional horsepower motors, *see* 711.21, 711.22; brushes, *see* 711.42; methods of testing, *see* 710, 711.20; grinding wheels, *see* 541.3.

711.25 Motors for Hazardous Locations

National Board of Fire Underwriters. American Standards Assn., C1-1940. National Electrical Code, 1940. Provisions to be observed for motors in locations in which flammable volatile liquids, highly flammable gases, or other highly flammable substances are manufactured, used, handled, or stored in other than their original containers; in locations in which combustible dust is thrown or collects; in locations in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used; and in locations in which easily ignitable combustible fibers are stored or handled.

Underwriters' Laboratories, Inc. Standard for Electric Motors and Generators for Use in Atmospheres of Combustible Dust; Class II, Groups F and G; 1943. Applies to electric motors for use in class II locations as defined in article 500, section 5006 of the 1940 edition of the National Electrical Code. Groups F and G casing, leads and connections, provision for connection to supply line, fans on fan-ventilated motors, marking, tests, inspection of listed product, description of label service, cost of service, and instructions to inspectors.

Underwriters' Laboratories, Inc. Standard for Electric Motors and Generators for Use in Hazardous Locations; Class I, Group D: Part I, Integral Horsepower Motors, 1943. Applies to electric motors for use in class I locations as defined in article 500, section 5005 of the 1940 edition of the National Electrical Code. Covers requirements for casing, provision for connection to supply line, fans on totally enclosed fan-cooled motors, plugs in enclosures, marking, tests, inspection of listed product, description of label service, cost of service, and instructions to inspectors.

References.—Motors, a.c. and d.c., *see* 711.21, 711.22; definitions, symbols, voltage and rating standards, classification, methods of test, safety codes, *see* 710, 711.20; brushes, *see* 711.42; cast iron, forged steel, shafts, *see* 611.11, 611,51, 611,52; copper wire, *see* 715.44.

711.3 RAILWAY MOTORS

American Institute of Electrical Engineers. A.I.E.E. 11; 1943. American Standards Assn., C35.1-1943. Rotating Electrical Machinery on Railway Locomotives and Rail Cars and Trolley, Gasoline-Electric and Oil-Electric Coaches. Includes all rotating electrical machinery forming a part of the power equipment of electrically-propelled railway cars and locomotives (including trolley, gasoline-electric and oil-electric coaches). Covers definitions, rating, insulation, dielectric tests, insulation resistance, commutation, overspeed tests, efficiency, and characteristic curves.

References.--See references under 711.25.

711.4 ACCESSORIES AND PARTS FOR MOTORS AND GENERATORS

U. S. Gov., U. S. Army, Signal Corps. Specification 71-512B; 1935. Leg; Type LG-2-A, Radio Generator.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-513A; 1943. Leg LG-3.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-592; 1931. Leg; Type LG-7, for Supporting Radio Generator.

711.42 Carbon Brushes for Motors and Generators

National Electrical Manufacturers Assn. Carbon, Graphite and Metal-Graphite Brushes, 43-85; 1943. Gives dimensions and tolerances for end bevels, toes, chamfers, flexible shunts for brushes, shunt length, shunt cable sizes and ratings, terminals for shunts, terminals for fractional horsepower brushes, coil springs for brushes, rectangular brushes, round brushes, holes, counterboring, countersinking, convexing and concaving, shoulders, slots, grooves, notches, and headed brushes; definitions; brush surfaces; brush connections; and brush clips.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R56-35; 1935. Carbon Brushes (Carbon, Graphite, and Metal Graphite) and Brush Shunts. This recommendation establishes a standard schedule of sizes and dimensions of carbon brushes and brush shunts, dimensions and tolerances of round and rectangular brushes, standard bevels and chamfers, lengths, sizes and stranding of shunts, sizes of terminals on shunts.

U. S. Gov., Navy Dept. Specification 17B8d; 1940. Brushes (and Brush-Material); Carbon, for Electrical Machinery.

712. BATTERIES AND ELECTROPLATING APPARATUS

712.0 GENERAL ITEMS

American Society for Testing Materials, D 639-43T; 1943. Tentative Methods of Testing Asphalt Composition Battery Containers. Intended for use in testing battery containers made of asphalt compositions as distinguished from those made of hard rubber. Gives chemical analysis for manganese and iron, and physical tests, for tensile strength and elongation, bulge test, sensitivity to hot-cold cycles, and acid absorption.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Copper-Oxide Caustic Soda Primary Cells. Protective housing, cells and renewal, precautions in handling caustic soda, treatment, and adjustment of rectifiers used with type A primary cells.

International Assn. of Industrial Accident Boards and Commissions, sponsor. American Standards Assn., Z9.1-1941. Safety in Electroplating Operations. Includes definitions, classifications of systems, specifications for an exhaust system, requirements on personal protection, inspection and maintenance with appendix on threshold limits, other hazardous operations performed in connection with electroplating, and general sanitation.

Society of Automotive Engineers. 1944 Handbook, Section 3—Processed Materials. S.A.E. General Information Electroplating Practice, Revised, 1942. Covers decoration and protection against corrosion, protection against corrosion, protection against wear, buildup of a part or parts undersize, plate for rubber adhesion, protection against carburization and for brazing operatings, and electroforming.

712.1 PRIMARY BATTERIES

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1939. Specification for No. 6 Dry Cell. Shall meet the requirements of the American Standards Assn. for dry cells and batteries.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, Specification 87-39; 1939. Type "A" Copper-Oxide Caustic Soda Primary Cell. For 250, 500, and 1,000 ampere-hour capacity, elements, jars, bolts and nuts, test requirements for capacity and operating voltage.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, Specification 170-39; 1939. Air Depolarized Dry Cell. Salammoniac cells with depolarizer and nonspillable electrolyte in zinc container, sealing compound, capacities, useful life tests, marking, and packing.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, Specification 171-39; 1939. Type "B" Copper-Oxide Caustic Soda Primary Cell. For a 500 ampere-hour battery, covers elements, electrolyte, jars, connections, and tests.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, Specification 172-40; 1941. Air Depolarized Carbon Caustic Soda Primary Cell. Describes a sodium hydroxide primary cell for new installations and where general renewal is desirable. Drawings detail cells of 450, 500, and 1,000 ampere-hour capacity; requirements for carbon block, caustic solution, oil, jars, and fittings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-23; 1937. Dry Cells. For standard No. 6 dry cells for use in telegraph and telephone, ignition, and other railway service; requirements as to quality of material and workmanship, inspection, and packing. This specification conforms to the requirements of American Standard C 18-1937 for specifications for dry cells and batteries.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-1; 1924. Specifications for the Installation and Maintenance of Gravity Batteries. Gives description of wet cell, consisting of copper and zinc electrodes in a copper sulfate solution, dimensions of glass jar, chemical reaction, useful life of each renewal, restoration of charge, design of battery rack with dimensional drawing.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-2; 1939. Specification for the Installation and Maintenance of Caustic Soda Batteries. Includes self-contained and field assembled types of glass jar, copper and zinc electrode, caustic soda solution cells, or internally connected batteries. Method of installation and maintenance instructions.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-3; 1924. Specifications for the Installation and Maintenance of Dry Batteries. Construction of zinc and carbon, salammoniac cell sealed in container, installation, battery racks, and useful life tests.

Radio Manufacturers Assn. Dry Cell Batteries M4-431 and M4-432; 1941. Standards for end of life cut-off voltages for dry A and B batteries.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-39-S. Batteries; Flashlight.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, sponsor. American Standards Assn., C18-1941. Circular C435. American Standard Specifications for Dry Cells and Batteries. Requirements on cells of salammoniac type with depolarizer and with nonspillable electrolyte. Includes nomenclature; general classification; standard sizes; material and workmanship; jackets; marking, zinc; sealing compound; mechanical top closure; terminal and cell connections; voltage tests; capacity tests; and required performance for No. 6 dry cells, assembled batteries of No. 6 cells, group batteries of small cells (for No. 6 cell applications), flashlight batteries, batteries for hearing aids, radio B batteries, and radio C batteries.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R104-30; 1930. Packaging of Flash-Light Batteries. This recommendation establishes a standard package for flash-light cells, number of cells per package for small size and large size cells. Sponsored by National Wholesale Druggists Assn.

U. S. Gov., Federal Specification W-B-101a; 1935. Amendment 1; 1935. Batteries and Cells; Dry. Covers the following types and classes—No. 6 general purpose dry cells (includes special grade and radio cells), No. 6 and size E telephone dry cells (light service cells grades A and B), assembled batteries of No. 6 cells (general purpose cells), flash-light cells and batteries, radio B batteries, and radio C batteries. Gives requirements for materials and workmanship, cells jackets, marking, zinc, sealing compound, mechanical closure, nomenclature, sizes an and terminals and cell connections; methods of sampling and test; and requirements for packaging, packing, and marking.

U. S. Gov., Joint Army-Navy Specification, JAN-B-18; 1944. Batteries; Dry.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Batteries for Flashlights.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-19-1924. Battery; type, BA-14, Alkaline Primary Cell.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-101; 1943. Battery BA-1.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-102; 1943. Battery BA-2.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-108; 1943. Battery BA-8.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-109; 1943. Battery BA-9.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-115; 1943. Battery BA-15-A.

U. S. Gov., U. S. Army, Signal Corps, Specification 70-123; 1943. Battery BA-23.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-126; 1943. Battery BA-26.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-127; 1943. Battery BA-27.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-128; 1943. Battery BA-28.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-131; 1943. Battery BA-31.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-132; 1943. Battery BA-32.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-133; 1943. Battery BA-33.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-134; 1943. Battery BA-34.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-135; 1943. Battery BA-35.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-136; 1943. Battery BA-36.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-137; 1943. Battery BA-37.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-138; 1943. Battery BA-38.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-139; 1943. Battery BA-39.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-140; 1943. Battery BA-40.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-141; 1943. Battery BA-41.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-142; 1943. Battery BA-42.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-143; 1943. Battery BA-43.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-144; 1943. Battery BA-44.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-148; 1943. Battery BA-48.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-149; 1943. Battery BA-49,

U. S. Gov., U. S. Army, Signal Corps. Specification 70-151; 1943. Battery BA-51.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-153; 1943. Battery BA-53.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-156; 1943. Battery BA-56.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-157; 1943. Battery BA-57.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-158; 1944. Battery BA-58.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-159; 1944. Battery BA-59.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-163; 1943. Battery BA-63.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-165; 1943. Battery BA-65.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-167; 1944. Battery BA-67.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-170; 1944. Battery BA-70.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-180-A; 1943. Battery BA-80.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-202; 1944. Battery BA-102.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-238; 1943. Battery BA-138.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-239; 1943. Battery BA-139.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-240; 1944. Battery BA-140.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-300; 1944. Battery BA-200/U.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-303; 1943. Battery BA-203/U.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-304; 1944. Battery BA-204/U.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-305; 1944. Battery BA-205/U.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-306; 1944. Battery BA-206/U.

References.—Maintenance and handling dry cells, *see* 712.0; gravity battery coppers and zincs, *see* 712.5; Sol ammoniac, copper sulphate, *see* 831.4, 839.33; caustic soda, *see* 834.8; battery boxes, *see* 712.3; flash lights, *see* 716.13.

712.2 STORAGE BATTERIES

American Institute of Electrical Engineers, 36; 1928. American Standards Assn., C40-1928. Storage Batteries. Gives construction, definitions of parts, of capacity, voltage, charging, discharging, efficiency, and rating.

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Storage Batteries. Covers installation and location, capacity, voltage, charging equipment, cable sizes, etc.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1940. Storage Batteries. Guarantee and adjustment arrangement for storage batteries for use in railway passenger cars. To make available to the railway companies, in a uniform manner, such data as may be required concerning the guaranteed life, adjustments and replacements, operating characteristics, ampere-hour capacity of various makes, types and sizes of battery offered for this class of service.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice Specification 49-39; 1939. Nickel, Iron, Alkaline Storage Battery. Standard capacities, containers, elements, weights, electrolyte, charging rate, and methods of test.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice Specification 53-39; 1939. Lead Acid Stationary Storage Battery. Glass jar battery with plates of composite structure supporting active material in the form of pure lead. Detailed requirements for signal service, capacities, jar sizes, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice Specification 58-39; 1939. Lead Acid Stationary Storage Battery. Glass jar battery with plates of pure lead, in combination with plates of alloy supporting active material in paste form. For signal service both new installations and renewals, sizes, charging, tests, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice Specification 158-39; 1939. Lead Acid Stationary Storage Battery. Pasted plate lead type battery in sealed-in glass jar for railway signal service. Five sizes of capacity and glass jar, composition of elements and separators, sealing compound, tests, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Storage Batteries. For stationary, semi-portable and portable batteries, specific gravity corrections for temperature, charging methods, installation, operation, and repairs.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-4; 1924. Addenda, 1931. Specification for the Installation and Maintenance of Stationary Lead Type Storage Batteries. Includes open and sealed glass jar batteries, construction of plates, chemical action, installation, charging, discharge, and maintenance.

National Board of Fire Underwriters. American Standards Assn., C1-1940. National Electrical Code, 1940. Requirements for unsealed jars and sealed rubber and glass jars, insulation, racks, trays, and battery rooms for lead-acid and alkali-type.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts and Fittings. S. A. E. Standard Storage Batteries. Revised, 1938. For all types of batteries now in general use in motorboats, motor vehicles, tractors, and automotive industrial applications for 6 and 12 volt electrical requirements. Multiple units of these types may readily be used for higher voltage requirements. Maximum dimensions are indicated in the specifications but, where space limitations are a factor, batteries of slightly reduced dimensions are usually available from the battery manufacturers. The specifications include the 5 second voltage test, thus providing a measure of cranking speed to that of current capacity to meet torque requirements, completing the standard specification for measuring cranking ability. The standard also provides a short time method for measuring the ability of a battery to maintain its ratings in service. The specifications are supplemented by notes on the test apparatus and procedure that are considered suitable and adquate for use where average laboratory facilities are available for conducting performance tests. Supplementary notes also describe two alternate types of equipment for conducting life tests, materials required, and general directions for assembling the life test equipment.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-13; 1943. Batteries; 12-Volt, 17-Ampere-Hour Shielded Storage.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-14; 1943. Batteries; 24-Volt, 11-Ampere-Hour Shielded Storage.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-B-141-1; 1943. Batteries; Storage, Shielded, General Specification.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-B-146-1; 1943. Battery; Storage, Shielded, 12-Volt, 34- Ampere Hour.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-B-149-1; 1943. Battery; Storage, Shielded, 24-Volt, 17-Ampere Hour.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-B-152-2; 1943. Batteries; 24-Volt, 34-Ampere Hour Shielded Storage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H31; 1940. American Standards Assn., C2. 1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. Also apply to similar equipment if installed in factories, mercantile establishments, vehicles or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 50 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. For storage batteries (sec. 13), requirements on isolation, ventilation, insulation, rack and tray, floors, wiring, guarding live parts and illumination in rooms enclosing batteries of nonseal type.

U. S. Gov., Federal Specification W-B-131b; 1939. Batteries, Storage; Ignition, Lighting, and Starting. Covers lead-acid type for use on passenger automobiles, motor trucks, motor coaches, and motorcycles. Gives requirements for types, capacities, sizes, ratings, location of battery parts, conditions for shipment, filled and charged, charged and dry, uncharged, connecting straps, intercell connectors, separators, polarity of terminals, tapered terminal posts, plates, post seals, devices, and electrolyte; methods of sampling and test; requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 17B4g; 1940. Batteries; Storage, Portable.

U. S. Gov., Navy Dept. Specification 17B9d; 1944. Batteries; Storage, Lead-Acid, Radio "B."

U. S. Gov., Navy Dept. Specification 17C12b; 1943. Compound; Battery-Sealing.

U. S. Gov., Navy Dept. Specification 18T18h; 1944. Testing Outfits; Storage Battery.

U. S. Gov., Treasury Dept., Procurement Div., 588a; 1944. Batteries; Storage, Lead-Acid (for general Service Including Motive Power, Excluding S11). Covers storage batteries for general use in stationary service, for general use in portable service, for motive power, and for engine starting of a special nature. Gives requirements for discharge characteristics, plates, elements, separators, retainers, electrolyte, jars, cell covers, sealing compounds, polarity marking, connectors, trays, assembly, sizes, charge condition for shipment initial performance, instructions, accessories, and warranty; methods of sampling, inspection, and tests; and packaging, packing and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 70-22-C; 1938. Battery; Storage, Aircraft, Lead-Acid Type, General Specification.

U. S. Gov., U. S. Army, Army Air Forces. Specification 70-28A; 1933. Battery; Aircraft Storage, Type C-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 70-29A; 1933. Battery; Aircraft Storage, Type D-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 70-30A; 1933. Battery; Aircraft Storage, Type E-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 70-31A; 1933. Battery; Aircraft Storage, Type B-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 70-34; 1935. Battery; Storage, Integrally Shielded, Lead-Acid Type, General Specification.

U. S. Gov., U. S. Army, Army Air Forces. Specification 70-40A; 1942. Battery; Aircraft Storage, Integrally Shielded, Type D-6A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 70-41; 1940. Battery; Aircraft Storage, Type F-1, 24-Volt.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-4C; 1924. Battery; Storage, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-20E; 1943. Battery BB-29; Storage, 4-Volt, 80-Ampere Hour.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-28C; 1931. Battery; Storage, Telephone Central Office, Sealed-Top Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-33; 1942. Battery; Type BB-46, 75-Ampere Hour Storage, 12-Volt.

U. S. Gov., U. S. Army, Signal Corps. Specification 70-37; 1935. Battery; Type BB-50, Storage, 12-Volt, 55-Ampere Hour.

U. S. Gov., U. S. Army, Signal Corps. Specification 70S-20; 1932. Battery; Type BB-45, Portable Lead Storage.

References.--Installation and maintenance, *see* 712.0; battery boxes, *see* 712.3; battery terminals and lugs, *see* 712,9; sulphuric acid, *see* 821.7; caustic soda, *see* 834.8.

712.3 BATTERY CASES

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of: Recommended Practice. Specification 113-39; 1939. Battery Jar. Detail requirements for a primary battery jar, caustic soda, heating, and chilling tests, and standard packing.

U. S. Gov., Navy Dept. Specification 17J3d; 1935. Jars, Storage-Battery, Rubber (Hard); Parts, Storage-Battery, Rubber (Hard and Soft) (Except Separators); (Submarine Use).

U. S. Gov., U. S. Army, Medical Department. Specification 10-2208B; 1942. Battery Box.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-199B; 1927. Box; Type BC-128, for Radio Batteries.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-587; 1931. Case; Type CS-39, Pressed Metal, Battery Carrying.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-658A; 1943. Box BX-4.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-900A; 1940. Box; Type BX-124, Radio Battery.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-923; 1937. Box; Type BX-13, Auxiliary Battery.

References.— Wood containers for cells, glass jars, battery trays and covers, *see* 712.2; methods of testing rubber goods, *see* 200.

712.4 BATTERY ELECTROLYTE

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1938. Specification for Electrolyte. For use in lead acid type storage battery, recommends the use of Federal Specification O-A-111 for Acid: Sulphuric, (for) Storage Batteries.

References.—Sulphuric acid, sal ammoniac, *see* 821.7, 831.4; caustic soda, copper sulphate, *see* 834.8, 839.33.

712.5 BATTERY ANODES AND CATHODES

712.9 MISCELLANEOUS BATTERY ACCESSORIES

Radio Manufacturers Assn. Battery Sockets, M4-071 to M4-073; 1941. Diagrammatic drawings showing standard arrangements of sockets for—radio A battery, radio A and B battery, radio B and C battery, and combination radio B and C battery.

U. S. Gov., Navy Dept. Specification 17S6b, 1942. Separators, Sheathings, and Baffledisks; Rubber (Hard), for Lead-Acid Storage Batteries.

U. S. Gov., Treasury Dept., Procurement Div., 347A; 1942. Chargers; Battery, Electronic, Tube Type. Covers two types—(I) suitable for charging automotive batteries, and (II) suitable for charging telephone batteries. Gives requirements for workmanship, case, control, fuse, ammeters, transformers, reactance, electronic tubes or bulbs, cord with plug, instructions, and details for each type; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3087; 1944. Battery Adapter FT-501.

713. TRANSFORMERS, ELECTRIC CONVERTERS, AND CONDENSERS

713.1 ELECTRIC CONDENSERS, STATIC

American Institute of Electrical Engineers, sponsor, No. 18; 1934. American Standards Assn., C55-1934. Standards for Capacitors. Applies to capacitors for; (a) Power applications—power factor correction, high frequency induction furnaces, and capacitor motors; (b) resonant shunts and filters; (c) blocking capacitors; and (d) power oscillator circuits.

American Standards Assn., C 16.6-1943. Fixed Paper-Dielectric Capacitors (Home Receiver Replacement Type) (American War Standard). Covers the basic requirements applicable to fixed paper-dielectric capacitors suitable for use as replacement parts in home radio receivers. Gives material, workmanship, detail requirements, standard capacitances, working voltages, and part numbers.

American Standards Assn., C 16.7-1943. Dry Electrolytic Capacitors (Home Receiver Replacement Type) (American War Standard). Covers the basic requirements applicable to dry electrolytic capacitors suitable for use as replacement parts in home radio receivers. Gives material, workmanship, design, detail requirements, standard capacitance, working voltages, and part numbers.

American Standards Assn., C 16.8-1943. Simplified List of Home Radio Replacement Parts (Paper and Electrolytic Capacitors, Volume Controls, Power and Audio Transformers and Reactors) (American War Standard). This standard covers only the electrical values of the listed parts and deems these values adequate for maintaining in operation the great majority of home radio receivers. Covers fixed paper-dielectric capacitors, dry electrolytic capacitors, volume controls, and transformers and chokes.

American Standards Assn., C 75.3-1942. Fixed Mica-Dielectric Capacitors (American War Standard). Covers physical dimensions, capacitance values, color coding, characteristics, and test procedures and requirements for a range of fixed mica-dielectric capacitors from the smallest sizes used in receivers to the large units for high-power transmitters. Gives applicable specifications and drawings, types, grades, classes, material and workmanship, general and detail requirements, methods of inspection and tests, packaging, packing, marking, requirements applicable to individual government departments, notes, and drawings giving details.

American Standards Assn., C 75.12-1944. Fixed Ceramic-Dielectric Capacitors (Temperature Compensating Types) (American War Standard). For the purpose of facilitating production of fixed ceramic-dielectric capacitors for use as temperature-compensating devices. Covers applicable specifications and drawings, classification, material and workmanship, general requirements, detail requirements; methods of sampling, inspection, and test; packaging, packing, and marking for shipment; requirements applicable to individual government departments; and notes and drawings.

American Standards Assn., C 75.16; 1944. Fixed Paper-Dielectric Capacitors (Hermetically Sealed in Metallic Cases) (American War Standard). Gives applicable specifications and drawings, classification material and workmanship, general requirements, detail requirements, methods of sampling, inspection, tests, packaging, packing, marking for shipment, requirements applicable to individual government departments. notes, and drawings.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 160-39; 1939. Capacitor for Power Factor Correction. For railway signal power distribution circuits, for various voltage ratings, design, leads and terminals, dielectric requirements, and tested in accordance with A.I.E.E. standards.

National Board of Fire Underwriters. American Standards Assn., C1-1940. National Electrical Code, 1940. Capacitors (Static Condensers). Requirements for installation, inclosure, and grounding.

National Electrical Manufacturers Assn., Edison Electric Institute, and Radio Mfgrs. Assn. (published jointly). Limiting Value of Capacitors When Used As Radio Filters on Portable Appliances, N.E.M.A. 105. Gives a general discussion of the various problems connected with the use of small capacitors on appliances for suppressing radio frequency voltages which may be generated by a make and break contact involved in the operation of the device. Also discusses recommendations and exceptions.

Radio Manufacturers Assn. Capacitors, M4-571 to M4-574, M4-591 to M4-598, and M4-711 to M4-726; 1938. Includes wet electrolytic, dry electrolytic, and fixed capacitors; general structural characteristics, dimensional requirements, and standard mounting hardware; also for fixed capacitors; numerical marking and color coding, voltage rating and testing, insulation resistance and standard performance tests.

U. S. Gov., Army Air Forces. Specification 32412-B; 1945. Capacitors; Fixed (Paper or Mica Dielectric).

U. S. Gov., Joint Army-Navy Specification JAN-C-5; 1944. Capacitors; Mica-Dielectric, Fixed.

U. S. Gov., Joint Army-Navy Specification JAN-C-20; 1944. Capacitors; Ceramic-Dielectric, Fixed (Temperature-Compensating).

U. S. Gov., Joint Army-Navy Specification JAN-C-62; 1944. Capacitors; Dry-Electrolytic, Polarized.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-261; 1924. Condenser; Types CA-102 and CA-103, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-350B; 1938. Capacitor; Telephone, Types CA-59 and CA-60.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-516E; 1941. Capacitor; Fixed, Paper or Mica Dielectric.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-692A; 1941. Capacitor Unit BE-59.

References.—Definitions, symbols, rating basis, standard voltages and frequencies, methods of test, safety code, *see* 710.

713.2 SYNCHRONOUS CONDENSERS AND CONVERTERS

American Institute of Electrical Engineers, sponsor, No. 11; 1937. American Standards Assn., C35-1936. Tentative Standards for Railway Cars and Other Rotating Electrical Machinery in Rail Cars and Locomotives. Definitions, classification, rating, and methods of test for rotating electrical machinery forming a part of the power equipment of electrically propelled railway cars and locomotives. Machines are classified as railway motors, auxiliary motors, generators, auxiliary generators and dynamotors, motors, and phase convertors.

American Standards Assn., C 39.4-1943. Dimensions for External Radio-Frequency Thermocouple Converters (120 Milliamperes to 10 Amperes, Inclusive) (American War Standard). For the purpose of facilitating the production of external radio-frequency thermocouple converters and the equipment in which they are used. Gives drawing showing details.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C50-1943. Rotating Electrical Machinery. Covers definitions, direct-current rotating machines, synchronous generators, synchronous motors, synchronous machines in general, synchronous convertors, induction motors and induction machines in general, direct-current and alternating-current fractional horsepower motors, and appendices.

National Electrical Manufacturers Assn. Motor and Generator Standards, 41-64; 1941. Frequency Converters and Motors above 60 Cycles for Industrial Purposes. For frequencies up to 180 cycles, converter rating, performance standards, temperature rise, and voltage regulation.

U. S. Gov., Army-Navy Aeronautical Specification, AN-I-10; 1944. Inverters; 400 Cycle and 800 Cycle.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32261; 1940. Inverter; Type B-8 (24 Volts).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1106; 1942. Inverter Unit PE-89-( ), 27.5-Volt d.c. to 115-Volt and 400-Cycle a.c.; and Inverter Unit PE-109-( ), 13.5-Volt, d.c. to 115-Volt and 400-Cycle a.c.

References.—Definitions, symbols, rating standards, voltage and frequency standards, methods of test, protection, safety codes, *see* 710, 711.20; brushes, *see* 711.42; alternating-current motors, *see* 711.21; cast iron, forged steel, shafts, *see* 611.11, 611.51, 611.52; plain bearings, ball and roller bearings, *see* 692.3, 766.2; copper wire, *see* 715.44.

713.3 DYNAMOTORS

American Standards Assn., C 75.13-1944. Dynamotors, (American War Standard). Covers applicable specifications and drawings, classification, material and workmanship, general requirements, detail requirements, methods of sampling, inspection, tests, packaging, packing, marking for shipment, requirements applicable to individual government departments, notes, and drawings.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-250; 1943. Dynamotor; Aircraft Camera Dual Conversion, 250 Watts.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-52-D; 1928. Dynamotor; Types DM-13-B and DM-13-C, Components of Radio Sets.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-56E; 1929. Dynamotor Unit; Type BD-41, Component of Radio Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1658-A; 1943. Test Set I-199 (Dynamotor).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-205C; 1934. Dynamotor Unit; Type BD-46, Component of Radio Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-565; 1932. Dynamotor; Type DM-( )-15.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-581A; 1933. Dynamotor Unit and Battery Box, Type PE-45; and Box, Type BX-3, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-824; 1941. Dynamotor Unit; Types BD-( )-69 and BD-( )-81.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-851B; 1940. Dynamotor Unit; Type BD-87-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-956A; 1939. Dynamotor Unit; Type PE-55.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-957; 1937. Dynamotor Unit; Type DM-19-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1118; 1941. Dynamotor; Type LM-18-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1369; 1942. Dynamotor Unit PE-135-( ).

713.4 MOTOR GENERATORS

American Institute of Electrical Engineers, A.I.E.E. 11; 1943. American Standards Assn., C35.1-1943. Rotating Electrical Machinery on Railway Locomotives and Rail Cars and Trolley, Gasoline Electric and Oil Electric Coaches. Includes all rotating electrical machinery forming a part of the power equipment of electrically propelled railway cars and locomotives (including trolley, gasoline electric, and oil electric coaches). Covers definitions, rating, insulation, dielectric tests, insulation resistance, commutation, overspeed tests, efficiency, and characteristic curves.

Industrial Truck Statistical Assn. Automatic Battery Charging Motor Generators, Rectifiers and Panels for Industrial Truck Motive Power Service, 1943. Gives requirements for sources of power, systems of battery charging, automatic features, automatic cut-off equipment, other automatic controls, time for recharging, constant current rates, modified constant voltage rates, two-rate charging, constant voltage motor generator design, constant current motor generator design, additional points of motor generator design—both types, motor generator switchboard design—modified constant voltage system, motor generator switchboard design—constant current system, motor generator switchboard design—two-rate systems, additional specifications—all types, rectifiers, table for modified constant voltage charging-design constants, table for modified constant potential charging nickel alkaline batteries, and table for lead-acid type batteries—two-rate charging constants for equipment design.

National Electrical Manufacturers Assn. Motor and Generator Standards 41-64; 1941. Motor-Generator Standards. Includes induction or synchronous direct current general purpose generators, 150 kw or smaller, motion picture motor generators, and synchronous motor generators 200 to 4,000 kw; basis of rating, performance standards, overload, dielectric test, efficiency as determined by American Standards A.S.A. C50, and allowable variations.

U. S. Gov., Army Air Forces. Specification 32327-A; 1942. Motor Generator (3 K.W., 15 Volt, Direct Current).

U. S. Gov., Army Air Forces. Specification 32329-A; 1942. Motor Generator (10 K.W., 30 Volt, Direct Current).

U. S. Gov., Army Air Forces. Specification 32345; 1941. Motor Generator (1,000 Watts, 30 Volts, Direct Current).

U. S. Gov., Army Air Forces. Specification 32448; 1943. Plant; Electric Power, Type B-8 (Gasoline Engine Driven—Stationary).

U. S. Gov., Army Air Forces. Specification 32457; 1944. Drive; Portable Motor Generator.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-246. Reconditioning of Electric Motor Generator.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-364. Motor Generators, Reconditioning (General Electric Co.).

U. S. Gov., U. S. Army, Ordnance Department. Specification 89-3030; 1933. Motor Generator; a.c.-d.c. Casemate.

U, S. Gov., U. S. Army, Ordnance Department. Specification 89-3075; 1941. Motor Generator Sets; a.c.-d.c. Submarine Mine.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-154C; 1927. Motor Generator; Type GN-32, Panel, Type BD-44; and Case, Type CS-24.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-216B; 1930. Motor Generator; Type MG-( )-4 and Panel, Type BD-( )-48 Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-520; 1929. Motor Generator; Type MG-( )-8 and Panel, Type BD-( )-44.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-584B; 1937. Motor Generator; Type MG-( )-10, 10-15 Volts to 450 Volts.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-702B; 1937. Motor Generator and Battery Unit; Type PE-48, 10-15 Volts to 450 Volts.

References.— Motors, alternating-current, *see* 711.21; generators, direct-current, *see* 711.12; synchronous converters, *see* 713.2; electric welding machines, *see* 767; *see* also references under 711.21 and 711.12.

713.5 TRANSFORMERS

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Transformers. Recommends use of dry type, air cooled, unless capacity, space or other restrictions warrant use of immersed (noninflammable liquid) self cooled or other suitable type. Specifies limits of temperature rise and temperature measurement.

American Standards Assn., C16.8-1943. Simplified List Of Home Radio Replacement Parts (Paper and Electrolytic Capacitors, Volume Controls, Power and Audio Transformers and Reactors) (American War Standard). This standard covers only the electrical values of the listed parts and deems these values adequate for maintaining in operation the great majority of home radio receivers. Covers fixed paper dielectric capacitors, dry electrolytic capacitors, volume controls, and transformers and chokes.

American Standards Assn., C 16.9-1943. Power and Audio Transformers and Reactors (Home Receiver Replacement Type) (American War Standard). Covers the basic requirements applicable to power and audio transformers and reactors suitable as replacement parts in home radio receivers. Gives material and workmanship, detail requirements—construction, detail requirements—electrical, detail requirements—humidity resistance, standard units, ratings, and part numbers.

American Standards Assn. Sponsored by Electrical Standards Committee. American Standards Assn., C57.1-1942; C57.2-1942; and C57.3-1942. Transformers, Regulators and Reactors. These standards apply to the following: (1) Distribution, power, and regulating transformers, and reactors other than current limiting reactors; (2) instrument transformers; (3) constant current transformers of the moving coil type; (4) step voltage and induction voltage regulators; (5) current limiting reactors; (6) general purpose specialty transformers. Covers definitions, standards common to transformers, regulators and reactors, standards for the six types named above, test code for transformers, and guides for operation of transformers and regulators.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 83-39; 1939. Air-Cooled Transformer. For railway signal service, wound in steps from 57.5 to 575 volts, terminal boards and size of leads, polarity of windings, performance tests, and loss limits. For indoor and outdoor use, cross-arm, wall, or shelf mounting.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 84-39; 1939. Transformer; Oil-Immersed, Self-Cooled. For railway signal service, outdoor or manhole type, pole or platform mounting. Windings, case, core, insulation, leads, etc. Detailed description of test.

Edison Electric Institute, 1-9, and National Electrical Manufacturers Assn., 110. Joint Committee on Standards for Distribution Transformers, 1942. Establishes design standards for certain mechanical and electrical features of single phase, pole type distribution transformers rated 100 kva and below, 15,000 volts and below. Gives scope voltage ratings, kva ratings, polarity, list of standard transformers and taps, other listed transformers and taps, ratio adjusters, tolerances, interchangeable mounting, bushings, high voltage bushing arrangement, low voltage bushing arrangement, internal connections (low voltage), external grounding provisions, internal grounding provisions, name plate, drain plugs, lifting lugs, oil level marking, protective devices, and list of appended drawings.

Edison Electric Institute. Suggestions for Specifications for Coordinated and Standardized Low Voltage Metering Current Transformers, No. MS-2; 1940. The increased use of low voltage networks and increasing capacities of all low voltage metering makes the development of a new coordinated and standardized line of current transformers desirable. Gives voltage rating, current rating, overload rating, temperature rise, burden, accuracy, polarity, terminals and dimensions, and diagrams with notes.

Edison Electric Institute. Specifications for Standard Current Transformers for Primary Circuits, No. MS-3; 1942. Gives impulse levels, recommended ratings for billing metering, dimensions, and diagram showing indoor type current transformer with table of dimensions.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C57.1, C57.2, C57.3. Proposed American Recommended Practices. Test Code for Transformers, Regulators, and Reactors. Guides for Operation of Transformers. Information relating to the terms and conditions upon which the rating and behavior of transformers and other induction apparatus are based, with special reference to the conditions upon which acceptance tests are made, and guides for testing such apparatus and for its operation in service. Definitions covering the various types of apparatus coming within the scope of the work are also included.

National Board of Fire Underwriters. American Standards Assn., C1-1940. National Electrical Code, 1940. Air-Blast, oil-immersed, and air-cooled transformers and auto transformers. Requirements for installation in generating stations, sub-stations, and other buildings; out-door installations; protection of live parts; internal clearances in case; operation; and grounding.

National Electrical Manufacturers Assn. Indicating Electrical Measuring Instruments—Instrument Transformers, Standard 37-42; 1937. Includes transformers suitable for use with measuring instruments, meters, relays, or tripping mechanisms; general requirements, rating, performance, manufacture, and definitions.

National Electrical Manufacturers Assn. Instructions for Care and Operation of Transformers, 37-46; 1937. For large transformers, and for distribution transformers (100 kva and smaller, under 15,000 volts), location, storage, handling, inspection, drying, sampling and testing of oil, operation, and temperature.

National Electrical Manufacturers Assn. Specialty Transformer Standards, 38-52; 1938. Covers manufacture, test, and performance of general purpose, luminous tube, signalling, doorbell, and high reactance control transformers.

National Electrical Manufacturers Assn. Transformer Standards 42-73; 1942. For power and distribution transformers, not including transformers for service such as synchronous converters, electric furnaces, instruments, etc. Gives general standards, lead markings and connections, manufacturings, performance and rating standards, definitions, and symbols.

National Electrical Manufacturers Assn. Transformers, Recommendations for the Conservation of Critical Materials, 43-84; 1943. In the interest of conservation of critical materials to help the war effort, these suggestions are offered with the understanding that they are of an emergency nature for the duration of the war. Covers transformers now in service, new transformers, and determination of KVA rating.

Radio Manufacturers Assn. Radio Transfermers, M2-113; 1930; and M4-505, M4-506, and M4-507; 1939. Includes audio transformers, insulation and electrolysis test, and color coding of leads; also for radio power and I.F. transformers, color coding requirements.

Radio Manufacturers Assn., Radio Power Transformers, M4-531, M4-536 to M4-538, M4-541, M4-542, M4-546 to M4-549; 1938. Enclosed dry type having one primary and suitable secondary windings; characteristics, permissible temperature rise, secondary voltages, load test apparatus and methods, dielectric, secondary, and induced voltage tests.

Underwriters' Laboratories, Inc. Standard for Specialty Transformers, 1940. Covers air-cooled transformers and reactors for general use and for use with mercury-vapor lamps, sun lamps, etc.; bell ringing transformers; oil-burner ignition transformers; gas-tube sign transformers for use with inert gas tubes; and toy transformers; to be employed in accordance with the National Electrical Code. Does not cover oil-filled transformers, special types of transformers covered in requirements for other electrical devices or appliances, auto-transformers forming parts of industrial control equipment, nor transformers having a primary rating of more than 600 volts. Mechanical assembly, cords, bushings, insulating material, coils, wiring devices, performance, enclosure, connections, spacings, rating, marking, and inspection of listed product.

U. S. Gov., Army Air Forces. Specification 32386; 1942. Booster, Voltage; Type A-1 (12 to 24 Volt D.C., Aircraft).

U. S. Gov., Army Air Forces. Specification 32430A; 1945. Transformer; Series (Subway with Detachable Couplings).

U. S. Gov., Army Air Forces. Specification 32470A; 1944. Regulator; Runway Control, Type B-1.

U. S. Gov., Army Air Forces. Specification 32481; 1944. Transformer; Runway Lamp Control, Type A-1.

U. S. Gov., Army Air Forces. Specification 32485-2; 1945. Transformer; Regulator Stabilizing, Type B-1.

U. S. Gov., Army Air Forces. Specification 32498; 1944. Transformer; Instrument Current, Type D-1, 400 Cycle, Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-7a; 1942. Transformers; Series multiple (Subway With Detachable Couplings).

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-39. Transformer; Oil, CSP, Power, Distribution 1 1/2-KVA.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-90. Transformer; 5-KVA, Oil-Immersed, for Service Distribution.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-175. Transformer Capacitor Unit, for Neon Approach Lights.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-383. Air Filter for Dust Removal (1,000 CFM Dry Type).

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-486. Air Filter and Drier for Transformer Breather Pipes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1 of the National Electrical Safety Code—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons, an accessible only to such persons. They also apply to similar equipment if installed in factories, mercantile establishments, vehicles or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. For transformers (sec. 14), requirements on current-transformer secondary circuits, grounding secondary circuits of instrument transformers, grounding transformer cases, location and arrangement of power transformers, resistance devices, and ground detectors.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Research Paper RP580; 1933. Equipment for Testing Current Transformers. Describes the equipment and test procedure developed at the National Bureau of Standards for measuring the ratio and phase angle of current transformers up to currents of 12,000 amperes at power frequencies. Data are given to show the accuracy of the standard current transformer used in the higher ranges, and the effectiveness of the shaping of the heavy-current circuit so as to minimize errors from stray magnetic fields.

U. S. Gov., Federal Specification W-T-631; 1942. Transformers; Distribution, Single-Phase, 60 Cycles (100 KV.-A. and Below: 15,000 Volts and Below). Covers three types and two classes. Gives requirements for materials, workmanship, classification of insulating materials, continuous rating, transformer performance, tolerances, name-plate marking, windings, taps, radio adjusters and connections of windings, polarity, leads, tank, oil, nonburning liquid, and accessories; methods of inspection and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 17T19d; 1939. Transformers; Electric, Miscellaneous (Exclusive of Power or Distribution and Instrument Types).

U. S. Gov., Navy Dept. Specification 17T20d; 1945. Transformers; Electric, Dry, Single-Phase, 60-Cycles.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Transformers, 1943. Distribution Type, self-cooled, oil-filled, 2400/4160 volts primary, 120/240 volts 3-wire secondary.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Transformers, 1944. 150 KVA, single-phase, 25 cycles, 2400/4160Y volts primary with four 2 1/2 percent full capacity taps below 2,400 volts, 240/120 volts, 3-wire secondary.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Transformers, 1944. 150 KVA, 25 cycles, 2,400 volts primary with 4 full-capacity 2 1/2 per cent high-voltage taps below 2,400 volts, 120/240 volts 3-wire secondary.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32082; 1941. Transformers; Aircraft, Power Supply.

U. S. Gov., U. S. Army, Medical Department. Specification 10-2777; 1939. Transformer; Cautery, Lamp-Socket Type, With Cord.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2801; 1939. Transformer; Cautery, Hospital Size.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-195B; 1929. Transformer; Type C-50-A, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-397H; 1941. Transformer; Types C-66-A, and C-107.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-398E; 1941. Transformer; Type C-65.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-399D; 1938. Transformer, Types C-62, C-124, and C-205, Audio Frequency.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-919A; 1938. Transformer; Type C-159.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-932B; 1941. Transformer; Type C-160.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1004; 1941. Transformer, Types C-253, C-254, and C-255; and Coil, Type C-279.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1011; 1943. Transformer C-223 and C-224.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1137; 1942. Transformer C-289-( ); Impedance-Matching for Headset Circuits.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1524; 1942. Transformer C-410.

References.—Transformers for electric arc and resistance welding apparatus, *see* 767; definitions, symbols, rating standards, voltage and frequency standards, methods of test, safety codes, *see* 710; transformer oil, *see* 504.8; auto transformer starters, *see* 714.11; cast iron, malleable cast iron, *see* 711.11, 711.21; sheet steel, *see* 604.2; copper wire, *see* 715.44.

713.6 CHOKE COILS, IGNITION COILS

Radio Manufacturers Assn. Iron Core Filter Inductors, M4-511 to M4-518; 1941. Recommended practice on rating filter inductor in henries at specified frequency, alternating voltage, and direct current, and on giving the direct current resistance. Also gives inductance, dielectric, and induced voltage test requirements, and resistance tolerances for various wire sizes.

U. S. Gov., Navy Dept. Specification 17C14b; 1944. Coils, Ignition, High-Tension (for Motorboat Engines).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-670D; 1941. Coil, Types C-105 and C-278, Induction.

References.—Definitions, symbols, frequency standards, methods of test, safety codes, *see* 710; impedance track bonds and reactors, *see* 718.49; choke coils for lightning protection, *see* 715.50; reactors, *see* 713.5.

713.7 RECTIFIERS

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941 Rectifiers and Motor Generators. Instructions for maintenance, adjustment, and test.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 166-39; 1939. Copper-Oxide Rectifiers and Valves. For battery charging, direct operation of direct current appliances from alternating current source, or as a valve in suppressing arcs formed at contacts, in prolonging the release period of direct current electromagnetic apparatus, as a snubber, etc. Design, rating insulation, and leakage current tests.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 189-40; 1941. Tantalum Rectifiers and Valves. For Battery charging, direct operation of d.c. appliances from a.c. source, or as a valve for controlling flow of current in railway signaling circuits. Requirements for design, rating, dielectric test, efficiency, and inspection.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-72; 1935. Four Volt D.C. Power Supply Units. For operation of communication equipment at way stations, including three types for use with storage battery and rectifier, and three types consisting of rectifier and filter. Construction and wiring in accordance with the requirements of the National Electrical Code, with capacity to operate approximately six 100 ohm telegraph sounders, two telephone transmitters, and two selector bells, or a total of 450 milli-amperes current, discharge rate of battery, sealed-in glass design, metal case, finish, and tests.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-32; 1942. Installation, Maintenance and Operation of Mercury Vapor Rectifiers for Telegraph Service. Gives scope, drawings, general requirements, description, theory, installation, and maintenance.

Underwriters' Laboratories, Inc. Standard for Rectifiers, 1940. Covers portable and stationary rectifiers for battery charging, motion-picture arc supply, signaling, and similar purposes to be employed on lighting and power circuits in accordance with the National Electrical Code. Frame and enclosure, mechanical assembly, corrosion protection, supply connections, wiring, insulating material, transformers, switches, overcurrent protection, capacitors, spacings, grounding, power input, temperature, dielectric strength, marking, and inspection of listed product.

U. S. Gov., Army Air Forces. Specification 32455; 1944. Rectifier; Direct-Current Power Supply (100 Amperes, 28 Volts; 200 Amperes, 14 Volts).

U. S. Gov., Army Air Forces Specification 32464 (B); 1945. Rectifier; Turret Trainer Power Supply (130 Ampere, 28 Volts D.C.).

U. S. Gov., Army Air Forces. Specification 32479; 1944. Rectifier; Aircraft Power, Type A-1.

U. S. Gov., Army Air Forces. Specification 32517; 1945. Rectifier; Direct Current Power Supply, Type B-2 (200 Amperes, 28 Volts).

U. S. Gov., Army Air Forces. Specification 32519; 1945. Rectifier; Direct-Current Power Supply, Type B-3 (400 Amperes, 28 Volts).

U. S. Gov., Navy Dept. Specification 17R3a; 1944. Rectifiers; Electric, Power, Tube Type.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Rectifiers.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-945A; 1939. Rectifier; Type RA-20.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-988; 1941. Rectifier RA-34-( ), Chest CH-57-( ), and Accessory Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1003; 1941. Rectifier, Type RA-36-( ), Telephone, Central-Battery Charging.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1037; 1941. Rectifier RA-37 and Chest CH-51.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1302; 1942. Rectifier RA-43-( ) and Case CS-82-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1634B; 1943. Rectifier RA-91-( ), Telephone, Central Battery Charging.

References.—Rectifier bulbs, *see* 718.62; synchronous converters, *see* 713.2.

714. SWITCHES, PANELS, METERS, AND CONTROLLING EQUIPMENT

714.1 CONTROLLING EQUIPMENT

714.10 General Items

American Standards Assn., C75.17-1944. Method of Noise-Testing Fixed Composition Resistors (American War Standard). For the purpose of establishing a uniform method of noise-testing fixed composition resistors. Gives scope and purpose, theory of operation, construction, and use.

714.11 Electric Controllers and Starters

American Institute of Electrical Engineers, 15; 1944. Joint sponsors with National Electrical Mfrs. Assn. American Standards Assn., C19.1-1943. American Standards for Industrial Control Apparatus. Includes industrial motor control, similar control used for industrial heating, and rheostats including those for generator field. Covers service conditions, definitions, ratings, and performance.

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and supplement, 1943. Control Apparatus. Covers installation and location, manual and magnetic types, protecting cases, resistors, circuit breakers, corrosion resistant parts, tests, temperature limits, contactors, and application.

American Standards Assn. Sponsored by Electrical Standards Committee. American Standards Assn., C57.1-1942; C57.2-1942; and C57.3-1942. Transformers, Regulators and Reactors. These standards apply to the following: (1) Distribution, power, and regulating transformers, and reactors other than current limiting reactors; (2) instrument transformers; (3) constant current transformers of the moving coil type; (4) step voltage and induction voltage regulators; (5) current limiting reactors; (6) general purpose specialty transformers. Covers definitions, standards common to transformers, regulators and reactors, standards for the six types named above, test code for transformers, and guides for operation of transformers and regulators.

Assn. of American Railroads, Operations and Maintenence Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. Includes (6-d-41) Motor Control Equipment. Gives recommendations for utilization of manual, magnetic, and semimagnetic full voltage and reduced voltage starters, synchronous type, reduced voltage starters with relays, and relays.

National Board of Fire Underwriters. American Standards Assn., C1-1940. National Electrical Code, 1940. Requirements as to location and function of controllers and starters for motors, generators, and control circuit transformers.

National Electrical Manufacturers Assn. Industrial Control Standards 40-59; 1940. For general standards and definitions applying to resistors, contactors, brakes, auto-transformers and reactors, a.c. and d.c. controllers; machine tool, synchronous motor, printing press, and mine hoist control; magnetic control for steel mill auxiliaries, overhead traveling cranes and floor operated cranes; terminal markings and guides to specifications for building equipment control apparatus.

Underwriters' Laboratories, Inc. Standard for Electric Fence Controllers, 1943. Covers scope, general requirements, frame and enclosure, mounting, mechanical assembly, corrosion protection, supply connections, current-carrying parts, wiring, insulating material, motors, motor control, capacitors, transformers, spacings, grounding, protective and indicating devices, operating characteristics, temperature test, dielectric strength test, rain and humidity tests, endurance test, abuse test, burnout test, rating, marking, and inspection of listed products.

Underwriters' Laboratories, Inc. Standard for Industrial Control Equipment, 1938. Appendix, 1939. Paragraphs 96-101 revised 1941. Switchboards, panelboards, resistors, and rheostats intended for starting, stopping, regulating, controlling or protecting electric motors in industrial applications, including refrigerating systems, used in accordance with the National Electrical Code. Does not include instruments. Covers enclosure, corrosion, switching, overload protection, relays, thermal, fuses, circuit breakers, mercury-tube switches, wiring, terminals, spacings, heating, operation, endurance, burnout, rating, and marking. Also special requirements of refrigerating system controllers.

Underwriters' Laboratories, Inc. Standard for Industrial Control Equipment for Use in Hazardous Locations, 1943. Applies to industrial control equipment for use in class I and class II locations as defined in article 500 of the National Electrical Code. Gives general requirement for class I equipment, "Air Brake Type" and "Oil-Immersed Type," and covers enclosure, provision for connection, oil level, temperatures, performance, and marking. Gives general requirements for class II equipment, and covers enclosure, provision for connection, temperatures, performance, and marking. Also covers inspection of listed products.

U. S. Gov., Army Air Forces. Specification 32470A; 1944. Regulator; Runway Control, Type B-1.

U. S. Gov., Army Air Forces. Specification 32473; 1944. Generator: Integral Turbo Supercharger Speed Control.

U. S. Gov., Army Air Forces. Specification 32511; 1944. Regulator; Alternator Voltage. For 208 volts, alternating-current, aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-1; 1943. Regulators; Generator Voltage.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-100. Beacon Control Switch. Cabinets, Types G-3 and T.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-418. Airport Lighting Control Panel for Runways.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. Also apply to similar equipment if installed in factories, mercantile establishments, vehicles, or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. Requirements for controllers (sec. 16).

U. S. Gov., Navy Dept. Specification 17C10a; 1938. Controllers; Alternating-Current (Shipboard Use).

U. S. Gov., Navy Dept. Specification 17M9d; 1938. Controllers (and Motors); Direct-Current, for Shipboard Auxiliaries.

U. S. Gov., Navy Dept. Specification 17R2b; 1939. Regulators; Automatic-Voltage, for Generators.

References.—Brakes for electric motors, *see* 711.21, 711.22; auto transformers, *see* 713.5; starting rheostats, *see* 714.12; track circuit controllers for railroad signals, *see* 718.42; definitions, symbols, rating basis, standard voltages and frequencies, methods of test, installation, safety codes, *see* 710; relays, *see* 718.43; panels and switchboards, *see* 714.4; fuses, meters, *see* 714.2, 714.3; switches and circuit breakers, *see* 714.5; automatic stations, *see* 714.13.

714.12 Resistors and Rheostats

American Standards Assn., C 75.5-1943. External Meter Resistors (Ferrule Terminal Styles), American War Standard. For the purpose of facilitating production of ferrule terminal external meter resistors and the equipment in which they are used. Gives applicable specifications and drawings, classification, material and workmanship, general and detail requirements, methods of sampling, inspection, tests, packaging, packing, marking for shipment, requirements applicable to individual government departments, notes, and drawing showing details.

American Standards Assn., C 75.7-1943. Fixed Composition Resistors, American War Standard. For the purpose of facilitating production of fixed composition resistors and the equipment in which they are used. Gives applicable specifications and drawings, classification, material and workmanship, general and detail requirements, methods of sampling, inspection, tests, packaging, packing, marking for shipment, requirements applicable to individual government departments, notes, and drawings showing tables.

American Standard Assn., C75.9-1944. Power-Type-Wire-Wound Rheostats, American War Standards. Covers applicable specifications and drawings, classification, material and workmanship, general requirements, and detail requirements; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment; requirements applicable to individual government departments, notes, and drawings.

American Standards Assn., C75.10-1944. Variable Wire-Wound Resistors (Low Operating Temperatures), American War Standard. For the purpose of facilitating production of low operating temperature variable wire-wound resistors and the equipment in which they are used. Covers applicable specifications and drawings, classification, material and workmanship, general requirements, detail requirements; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment; requirements applicable to individual government departments, notes, and drawings.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 106-39; 1939. Resistor. Rating to give total resistance, resistance between taps, minimum resistance, and continuous current capacity, permissible temperature rise, insulation and conductor requirements, surface leakage distance, test requirements for dielectric strength and for excess voltage.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-24; 1927, and 2-G-25; 1927. Resistance Units AAR-6-B and AAR-8-B. Includes 1,500 ohm, 0.051 ampere unit, and 250 ohm, 0.147 ampere unit for use in ferrule type mountings, protected winding or resistance wire on porcelain tube fitted with brass ferrules, dimensional drawings, finish, and test requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-31; 1928. Resistance AAR-2-A. For regulating current of telegraph and telephone apparatus, covers 26 sizes from 10 to 5,000 ohms and current ratings of 1.000 to 0.045 ampere. Gives requirements for Edison base, resistance wire wound on an insulating core, finish, tests, and dimensional drawing.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-62; 1930. Resistance AAR-7-A. For use in regulating the current of communication apparatus, resistance element supported by an insulating core and protected by a covering of fireproof, noncorroding, insulating material, construction and dimensions, nominal resistance of 2,500 ohms.

Assn. of American Railroads, Telegraph and Telephone Section, 4-13; 1927. Protective Resistances and Mountings. For protection of telegraph and telephone plant against currents from operating voltages, but not for regulating operating currents of various circuits. Includes resistances with ferrule or lug terminals, with terminals to fit into a socket, and resistance lamps, design, material, workmanship, electrical and mechanical requirements, and tests.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Resistors and Reactors. Requirements regarding noncombustible supports, air space about resistors, marking of terminals, operating, and design requirements for motor starting rheostats, insulation and installation of connecting wires, requirements on mounting and inclosures, mounting of resistance lamps.

Radio Manufacturers Assn. Resistors, M1-213, M4-214A to M4-217, 1939; M4-221, 1938; and M4-331 to M4-335, 1936. Includes color code for resistance value identification, fixed composition resistor with radial leads, and axial leads, decimal multipliers and tolerances, table of preferred number values for fixed composition resistors, classification of fixed wire wound resistors, determination of ratings, and dimensional requirements.

Radio Manufacturers Assn. Adjustable Resistance Units, M4-611, M4-612, M4-614 to M4-633, M4-635, and M4-641; 1937. Gives standards for shaft dimensions, mounting bushings and nuts, locking projections, definition of test points, performance specifications, and test procedure.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-13; 1942. Resistors; Adjustable Thermocouple Lead.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-14a-2; 1944. Rheostats; Aircraft Power.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. Also apply to similar equipment if installed in factories, mercantile establishments, vehicles, or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. Requirements for resistance devices (sec. 14).

U. S. Gov., Joint Army-Navy Specification JAN-R-11; 1944. Resistors; Fixed Composition.

U. S. Gov., Joint Army-Navy Specification JAN-R-19; 1944. Resistors; Variable Wire-Wound (Low Operating Temperature).

U. S. Gov., Joint Army-Navy Specification JAN-R-22; 1944. Rheostats; Wire-Wound, Power-Type.

U. S. Gov., Joint Army-Navy Specification JAN-R-26; 1944. Resistors; Fixed Wire-Wound, Power Type.

U. S. Gov., Joint Army-Navy Specification JAN-R-29; 1944. Resistors; External Meter, High Voltage, Ferrule Terminal Type.

U. S. Gov., Navy Dept. Specification 17R1; 1934. Rheostats (Aircraft Use).

U. S. Gov., Navy Dept. Specification 17R4; 1942. Resistors; Electric (Exclusive of Instrument Multipliers).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-91A; 1931. Rheostat; Type RS-33, for Regulating Battery Current.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-521B; 1935. Resistor; Fixed, 2 Watts Rating.

References.—Definitions, symbols, rating basis, methods of test, marking of terminals, service standards, safety codes, *see* 710; resistance wire, *see* 715.43; cast iron, *see* 611.11; porcelain for electrical purposes, *see* 532.22.

714.13 Automatic Stations

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C37.2-1937. American Institute of Electrical Engineers' Standard C37.2. Standard for Automatic Stations. Requirements on automatic power switchgear equipment for all classes of service. Includes service conditions, definitions, ratings, heating and temperature limitations, tests, nameplates, device function numbers and designations, minimum protection standard, and alphabetical index to device function numbers.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32205; 1940. Control System, Automatic (Airdrome Lighting, Alternating Current, Electric Power Plants) General Specification for.

References.—Definitions, symbols, rating basis, voltage and frequency standards, methods of test, service standards, safety codes, *see* 710; automatic switchgear, *see* 714.50.

714.14 Relays

American Standards Assn., C37.1-1937. Sponsored by the Electrical Standards Committee. Standard for Relays Associated With Power Switchgear. This standard covers all relays directly associated with power switchgear. Gives service conditions, definitions, ratings, heat and temperature limitations, limitations other than heating, and dielectric tests.

U. S. Gov., Army Air Forces. Specification 32368; 1942. Relay; Generator Current Control Switch (12 Volt D.C.).

U. S. Gov., Army Air Forces. Specification 32424-B; 1945. Relay; Current, Type B-8A, 24 Volts D.C., Intermittent Duty.

U. S. Gov., Army Air Forces. Specification 32439A; 1944. Relay; Current, Type B-9 (Single Pole, Double Throw, Time Delay).

U. S. Gov., Army Air Forces. Specification 32452; 1944. Relay; Current, Type B-10 (24 Volts D.C., Single-Pole).

U. S. Gov., Army Air Forces. Specification 32467-2; 1944. Relay; Current, Type B-11 (24 Volts D.C., Single-Pole).

U. S. Gov., Army Air Forces. Specification 32471; 1944. Relay; Current, Type D-1 (115 Volts, 400 Cycle, Single Pole).

U. S. Gov., Army Air Forces. Specification 32476; 1944. Relay; Current (24 Volts, D.C.), General Specification for.

U. S. Gov., Army Air Forces. Specification 32489-A; 1945. Relay; Current, Type B-13, 24 Volts D.C., Single Pole.

U. S. Gov., Army Air Forces. Specification 32490-A; 1945. Relay; Current, Type B-14, 24 Volts D.C., Single Pole.

U. S. Gov., Army Air Forces. Specification 32491; 1944. Relay; Current, Type B-15, 24 Volts D.C., Single Pole-Double Throw.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-109; 1944. Cabinet and Relay Assembly; Runway Selector.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-123; 1944. Cabinet and Relay Assembly; Distribution.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-20; 1945. Relays; Direct Current.

U. S. Gov., Navy Dept. Specification 17R6; 1942. Relays; Electric (Shipboard Use).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-7100; 1941. Relay; Submarine Mine.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-629-A; 1937. Relay; Type SW-37, Mainline Telegraph.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1144; 1942. Relay Box BC-615.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1145; 1942. Relay Box BC-616.

References.—Track and railway signal relays, *see* 718.43. Definitions, symbols, rating basis, voltage and frequency standards, methods of test, service standards, safety codes, *see* 710.

714.2 FUSES AND FUSE HOLDERS

714.20 General Items

U. S. Gov., Navy Dept. Specification 17P6a; 1942. Pullers; Fuse.

714.21 Fuses

American Hospital Assn., 19-4. Nonrenewable Inclosed Cartridge Fuses. Based on U. S. Gov., Federal Specification W-F-791, Nonrenewable Inclosed Cartridge Fuses.

American Hospital Assn., 19-7. Renewable (Fusible Links Separately Enclosed). Enclosed Cartridge Fuses. Based on U. S. Gov. Federal Specification W-F-805, Fuses; Cartridge, Enclosed, Renewable (Fusible Links Separately Enclosed).

Assn. of American Railroads, Telegraph and Telephone Section, 4-3; 1924. Telegraph and Telephone Line Fuses. Tubular type, readily replaceable for 7 to 15 amperes, meeting requirements of the National Electrical Code for "fuses of signaling system protectors," materials, and tests.

Assn. of American Railroads, Telegraph and Telephone Section, 4-6; 1924. Telegraph and Telephone Instrument Fuses. For fuses under one ampere, replaceable type, design, material and workmanship, with electrical requirements, marking, and tests.

Assn. of American Railroads, Telegraph and Telephone Section, 4-7; 1924. Telegraph and Telephone Heat Coils. For protection of instruments and wiring on the office side of office arresters, replaceable type for 0.2 to 1.0 ampere capacity, design, material and workmanship, electrical and mechanical requirements, marking, and tests.

Assn. of American Railroads, Telegraph and Telephone Section, 4-17; 1938. Communication Battery Supply Fuses. Includes 1/2 to 5 ampere cartridge type replaceable class B fuses applied to leads from power supply such as motor generators, storage batteries, rectifiers, etc. Requirements for design, material, and workmanship, fiber parts to meet specifications of the National Electrical Manufacturers Assn., for vulcanized fiber, fusing element when tested to meet A.S.T.M. Specification B-35, tests, and marking.

National Electrical Manufacturers Assn. Distribution Cutout and Power Fuse Standards, 44-93; 1944. Gives rating standards, performance standards, application standards, and manufacturing standards for distribution cutouts, fuse links, and power fuses; definitions including general parts, classification by construction, mounting and operation, rating, performance and test, and miscellaneous; and instructions for the installation, operation, and care of distribution cutouts and power fuses.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts and Fittings. S.A.E. Standard Electric Fuses. Revised, 1941. Although intended primarily for automotive purposes, these fuses are suitable for use to some extent in other equipment such as automobile radio sets, where it is desired to service with these standard fuses as much as possible. Diagram and table of dimensions and cap thicknesses for capacities from 6 to 30 amps.; and requirements for rating, test, length, caps, and completed tube.

Underwriters' Laboratories, Inc. Fusible Links, 1939. For examination and test of fusible links. Gives requirements for design and construction, practicability, durability, strength, reliability of operation, and uniformity.

Underwriters' Laboratories, Inc. Standard for Automotive Glass Tube Fuses, 1938. For the protection of circuits of 25 volts or less, type S.F.E. Covers design and construction of tubes, ferrules, sizes, marking, overload, and tests.

Underwriters' Laboratories, Inc. Standard for Fuses, 1941. Covers 125-volt plug fuses rated at 30 amperes or less, and 250-and 600-volt cartridge-enclosed fuses rated at 600 amperes or less, of the nonrenewable, multiple, and renewable types to be employed in accordance with the National Electrical Code. Does not cover fuses for attachment plugs nor fuses designed for use in car-lighting, instrument-protective, or signal-system fuse holders. Requirements for design and construction, and for inspection of listed product.

U. S. Gov., Army Air Forces. Specification 32505; 1944. Fuses; Alternating Current, 400 Cycle, Aircraft.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. They also apply to similar equipment if installed in factories, mercantile establishments, vehicles, or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. For fuses (sec. 16), requirements on where fuses are required, disconnection of fuses before handling, and grounding live parts.

U. S. Gov., Federal Specification W-F-791a; 1942. Fuses; Cartridge, Inclosed, Nonrenewable. Covers two classes—voltages not over 250 and voltages not over 600. Incorporates (by reference) Underwriter's Laboratories Standard for Fuses. Gives requirements for material and workmanship, marking, dimensions, carrying capacity, temperature, and overload blowing; methods of inspection and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification W-F-803a; 1941. Amendment 4; 1944. Fuses; Cartridge, Inclosed, Renewable (Fusible Links Not Separately Inclosed); and Renewal-Links Therefor. Covers two types—(I) without increased time-lag characteristics and (II) with increased time-lag characteristics; and two classes—voltage not over 250 and voltage not over 600. Gives requirements for material, workmanship, marking dimensions, carrying capacity, temperature, overload blowing, and short circuit test; methods of sampling

inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification W-F-805; 1933. Amendment 4; 1944. Fuses; Cartridge, Inclosed, Renewable (Fusible Links Separately Inclosed). Covers one type and two classes—voltage not over 250 and voltage not over 600. Gives requirements for material, workmanship, dimensions, tolerances, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification W-F-831; 1935. Amendment 1; 1939. Fuses; Plug, Nonrenewable. Covers medium screw type, carrying capacities 10, 15, 20, 25, and 30 amperes, 125 volts, in two types—(I) without increased time-lag characteristics, blowing time not to exceed 60 seconds at 150 percent of rated current; and (II) with increased time-lag characteristics, blowing time to be not less than 30 seconds, nor more than 120 seconds, at 200 percent of rated current; classed and designated according to material of construction, as fire-resistive molded composition; glass; porcelain; and porcelain with nonferrous metal caps. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification W-H-636; 1936. Amendment 1; 1941. Hot-Plates; Electric. Covers Three types—(I) light duty, portable, open-coil and enclosed-coil, designed for light-duty cooking and similar applications of electric heat, single-unit and two-unit, complete with switch control and flexible cord and plug-cap for connection to suitable outlet; and (II) heavy duty, semiportable, enclosed-coil for use as single units, and arranged for banking in multiple, and equipped with outlet box for permanent electrical connection to circuit. Covers nickel-plated, chromium-plated, vitreous-enameled or black-japanned top frames. Standard voltage ratings of the heater elements are either 115 or 230 volts, a.c. or d.c. circuits; class A, double-unit hot plates, type I; class B, single-unit hot plates, type I—nominal rating 1,100 +100 watts, three heats; and class C, single-unit hot plate, type II—nominal rating 2,000 watts + 200 watts, three heats. Gives detail requirements; methods of inspection and tests; and requirements for packing and marking for shipment. Emergency Alternate Federal Specification E-W-H-636; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.), changed thickness of chromium plating, omits undercoats for same, deletes nickel-plated, and changes requirements for construction of heating units.

U. S. Gov., Navy Dept. Specification 17F2j; 1945. Fuses; Electric.

U. S. Gov., Navy Dept. Specification 17F10d; 1944. Fuse-Indicators; Lamp-Type.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32084; 1941. Fuses; Cartridge, Inclosed Non-Renewable, for Aircraft (Electric Motor Protection).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-4513; 1941. Fuse; Time-delay, 0.150-ampere.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-310; 1924. Fuse, Type M-36; for Monochord Switchboard, Types BD-9, BD-10, and BD-11.

References.—Fuse blocks, cut-out bases, *see* 714.22; definitions, symbols, service standards, safety codes; *see* 710.

714.22 Fuse Blocks, Cut-Out Bases, and Clips

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-5; 1924 and 2-G-6; 1924. Fuse Blocks AAR-1-A and AAR-2-A. Two sizes of white porcelain fuse blocks, requirements as to quality, absorption test, clips of German silver, sealing compound composition, and dimensional drawings of 6-fuse and 10-fuse blocks.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-77; 1937. Potential Block AAR-1-A. Gives general requirements, material and workmanship, dimensions, finish, assembly, inspection and tests, packing, marking, and warranty.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Cut-out Bases. Capacity limits, spacing of metal parts, break distance for link fuse, for mountings on slate, marble or composition bases, classification of plug and cartridge cut-outs according to voltage and current capacity.

National Electrical Manufacturers Assn. Distribution Cutout Standards 38-53; 1938. Gives requirements for fuse cutout current ratings, fuse link continuous current ratings, switch blades, voltage rating, interrupting capacity rating, etc., performance standards, application, and manufacture. Change (approved Sept. 9, 1942) for duration of emergency, reduces overall length of universal fuse links (0 to 15 kv) for distribution cutouts from 23 to 20 in. (minimum).

National Electrical Manufacturers Assn. Distribution Cutout and Power Fuse Standards, 44-93; 1944. Gives rating standards, performance standards, application standards, and manufacturing standards for distribution cutouts, fuse links, and power fuses; definitions including general, parts, classification by construction, mounting and operation, rating, performance and test, and miscellaneous; and instructions for the installation, operation and care of distribution cutouts and power fuses.

Underwriters' Laboratories, Inc. Standard for Fuse-Holders, 1943. Covers fuse-holders for cartridge, plug, and link fuses, and fuse-holders and adapters for type S fuses, to be employed in lighting and power circuits in accordance with the National Electrical Code. Gives requirements for bases—insulating material, sealing, current-carrying parts, spacings, cover plates, rating, marking, and inspection of listed product.

U. S. Gov., Army Air Forces. Specification 32506; 1944. Fuse-Blocks; Alternating Current, 400 Cycle, Aircraft.

U. S. Gov., Federal Specification W-B-81a; 1935. Bases; Cut-Out, Enclosed-Cartridge, for Open-Link and Plug-Fuses. Covers three types—(I) to receive plug fuses, (II) to receive enclosed cartridge fuses, and (III) to receive open-link fuses. Gives requirements for classification, sizes, material, workmanship, current carrying parts, wiring terminals, cartridge fuse terminals, cartridge-fuse cut-out bases, plug-fuse terminals, link-fuse terminals, spacings (link-fuse cut-out bases). Cover plates, rating, and marking; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Slate for electrical purposes, *see* 511.53; porcelain insulation for fuse blocks, *see* 532.22; definitions, symbols, basis of rating, methods of testing, service standards, safety codes, *see* 710; terminal blocks, *see* 715.39.

714.3 INSTRUMENTS AND METERS, ELECTRICAL

714.30 General Items

American Standards Assn., C 39.2-1944. Electrical Indicating Instruments (2 1/2 and 3 1/2 in., Round Flush-Mounting, Panel-Type), American War Standard. For the purpose of facilitating production of electrical indicating instruments. Gives applicable specifications and drawings, classification, material, and workmanship, general and detail requirements, methods of inspection and tests, packaging, packing, marking, requirements applicable to individual government departments, notes, list of special instruments, and drawings showing details.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1941. Foam Meter Maintenance. Covers foam meter instrument box, emergency shut-off valve. electrodes, foam meter blow-off cock, solenoid valve, conduit and wiring, and dynamo voltage.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C39.1-1938. American Institute of Electrical Engineers' Standard C39.1. Electrical Indicating Instruments. Definitions of instruments and parts, classification, heating limitations and measurement, dielectric test and insulation resistance, construction.

National Board of Fire Underwriters. American Standards Assn., C1-1940. National Electrical Code, 1940. Location of meter in connection with over-current devices.

National Electrical Manufacturers Assn. Indicating Electrical Measuring Instruments—Instrument Transformers, Standard 37-42; 1937. Covers manufacture, test, and performance of electrical measuring instruments; classification as to use, principle of operation and protection; rating, ranges, dimensions, and definitions. Also for the construction of suitable transformers for use with measuring instruments, meters, relays, or tripping mechanism.

References.—Automobile instrument mountings, *see* 722.32; measurement of temperature coefficient of resistance of manganin and constantan wire, *see* 715.43.

714.31 Ammeters

American Standards Assn., C 39.5-1943. External Ammeter Shunts for Panel-Type Instruments, American War Standard. Covers applicable specifications and drawings, classification, material and workmanship, general and detail requirements; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment; and requirements applicable to individual government departments, notes, and drawings.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 85-39; 1939. Portable Direct Current Voltmeters, Ammeters and Volt-Ammeters. For railway signal service, self-contained ranges scales, zero corrector, shielding, case, temperature error, and accuracy.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 112-39; 1939. Portable Alternating Current Ammeter. For testing electrical apparatus and circuits in signal systems. Twelve combinations, ranges, and scales, permissible error due to heating, impedance limits, and dielectric requirements.

U. S. Gov., Army Air Forces. Specification 32463-2; 1945. Ammeter; Direct Current, Type G-1 (Aircraft).

U. S. Gov., Army Air Forces. Specification 32497; 1944. Ammeter; Alternating Current Type H-1, 400 Cycle, Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-19a; 1944. Ammeters and Voltmeters; Direct Current.

U. S. Gov., Joint Army-Navy Specification JAN-I-6; 1944. Instruments; Electrical Measuring, Indicating, Basic, Voltmeters and Ammeters.

U. S. Gov., Joint Army-Navy Specification JAN-S-61; 1944. Shunts; External Ammeter (Light Weight Type).

U. S. Gov., Navy Dept. Specification 17-I-51; 1944. Instruments; Electrical-Measuring Split-Core-Ammeter, Portable.

References.—Voltammeter, *see* 714.32; definitions, symbols, classification, test requirements, construction, error, safety codes, *see* 714.30, 710; meter binding posts, *see* 714.37; copper wire, *see* 715.44.

714.32 Voltammeters

U. S. Gov., U. S. Army, Signal Corps. Specification 71-293B; 1934. Voltammeter, Type I-23, 0-10 Volts, 0-35 Amps., q.c. Watch Case.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-294-A; 1938. Voltammeter, Type I-50, 150-15-3 Volts, 3-15-3 Amperes.

References.—*See* references under 714.31.

714.33 Voltmeters

American Institute of Electrical Engineers, A.I.E.E. 4; 1943. American Standards Assn., C68.1-1942. Measurement of Test Voltage in Dielectric Tests. Sets forth methods for the measurement of test voltages and wave shapes used in dielectric tests of electrical apparatus or insulating material. These tests are in three classes—(1) puncture tests, (2) flash-over tests, (3) voltage proof tests. Covers dielectric tests, voltage measurements, alternating voltage tests, direct voltage tests, surge voltage tests, and testing equipment and arrangement.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 115-39; 1939. Portable Alternating Current Voltmeter. For signal testing, two sizes for accurate, and three for less accurate usage, ranges and scales, knife-edge pointer tip, jeweled bearings, case, etc. Requirements as to heating, sensitivity, and accuracy.

U. S. Gov., Army Air Forces. Specification 32371-A (1); 1942. Voltmeter, Portable Direct Current (0-30 Volts).

U. S. Gov., Army Air Forces. Specification 32499; 1944. Voltmeter; Alternating Current, Type C-2, 400 Cycle, Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-19a; 1944. Ammeters and Voltmeters; Direct Current.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-19a; 1944. Voltmeters; 0-150 Volt 400 Cycle Alternating Current.

U. S. Gov., Joint Army-Navy Specification JAN-I-6; 1944. Instruments, Electrical Measuring, Indicating, Basic, Voltmeters and Ammeters.

References.—See references under 714.31.

714.34 Watthour Meters

Edison Electric Institute. Joint sponsor with National Bureau of Standards and Assn. of Edison Illuminating Companies. American Standards Assn., C 12-1941. Code for Electricity Meters. Covers devices for the measurement of electric energy distributed by alternating current or by direct current. Gives definitions, standards, measurement of power and energy, specifications for acceptance of types of meters, specifications for acceptance of types of auxiliary apparatus for use with meters, installation methods, watthour meter test methods, and laboratory and service tests.

Edison Electric Institute. Suggestions for Specifications for Standard Dial Constants for Alternating-Current Watthour Meters, MS-1; 1940. Covers the use of standard four dial registers with dial constants of one, ten, and powers thereof. Gives formula for computing expected maximum KWHR registration within indexing period, extended load range, dial constants, dial constants other than ten or some power thereof, and table showing dial constants.

U. S. Gov., Navy Dept. Specification 17-I-21; 1942. Instruments, Electrical-Measuring, Voltage—Current Indicating: Varmeters, Wattmeters, and Power-Factor Meters.

U. S. Gov., Navy Dept. Specification 17M4c; 1940. Meters; Watt-Hour (Shore Use).

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Meters, Watthour, Polyphase, 1937.

References.—Demand wattmeters, *see* 714.38; definitions, classification, symbols, construction, error, safety codes, standard voltages and frequencies, *see* 714.30, 710; meter cabinets, *see* 715.12; copper wire, *see* 715.44.

714.35 Wave Meters

U. S. Gov., U. S. Army, Signal Corps. Specification 71-647; 1931. Wavemeter, Type BC-184.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-650; 1933. Wavemeter, Type BC-( )-153.

References.—Radio-frequency meters, *see* 718.65.

714.36 Wheatstone Bridge

U. S. Gov., Navy Dept. Specification 17T17c; 1944. Testing-Sets, Electric, Wheatstone-Bridge Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-110-D; 1938. Test Set, Type 1-49.

714.37 Electrical Meter Parts

714.38 Demand Wattmeters

Edison Electric Institute. Joint sponsor with National Bureau of Standards and Assn. of Edison Illuminating Companies. American Standards Assn., C 12-1941. Code for Electricity Meters. Includes demand meters and devices. Gives definitions, classification of demand meters; acceptance tests for curve drawing meters, integrated-demand meters, lagged-demand meters, contact-making clocks, demand-totalizing relays, and contact mechanisms, and laboratory and service tests.

References.—Watthour meters, *see* 714.34; definitions, classification, symbols, test requirements, construction, error, safety codes, standard voltages and frequencies, *see* 714.30, 710; copper wire, *see* 715.44.

714.39 Miscellaneous Electrical Measuring Instruments

American Standards Assn., C-39.3-1943. Shock-Testing Mechanism for Electrical Indicating Instruments (2 1/2 and 3 1/2 in., Round, Flush-Mounting, Panel-Type), American War Standard. For indicating instruments for use in mobile and field communications equipment and other apparatus subject to severe shock. Gives general design, theory of operation, use, construction, mounting of mechanism, calibration curves, and drawings showing details.

Edison Electric Institute. Specifications for Indicating and Cumulative Demand Register Scales, No. MS-4; 1942. Gives scale classes, multiplying constants, name plates, length of scale, type of scale divisions, type of indicating pointer, marking of register face plates, method of indicating demand reading, indicator dial arrangement, and marking of register face plates.

U. S. Gov., Army Air Forces. Specification 24868-1; 1944. Tester; Electrical Circuit, 24-28 1/2 Volts D.C.

U. S. Gov., Army Air Forces. Specification 24971; 1944. Tester; Electrical Circuit, Type B-2, 24-28 1/2 Volts, D.C.

U. S. Gov., Army Air Forces. Specification 32437 (1); 1944. Tester; High Rate Discharge Battery.

U. S. Gov., Army Air Forces. Specification 32453-1; 1945. Tester; Aircraft Electrical System.

U. S. Gov., Army Air Forces. Specification 32500; 1944. Watt-Varmeter; Alternating Current, Type A-1, for 400 Cycle, Aircraft.

U. S. Gov., Army Air Forces. Specification 32507; 1944. Tester; Electrically Heated Suit.

U. S. Gov., Army Air Forces. Specification 32508; 1944. Frequency-Meter; Alternating Current, Type B-1, for 400 Cycle, Aircraft.

U. S. Gov., Army Air Forces. Specification 40884; 1944. Volt-Ohm-Milliammeter; Instrument Maintenance.

U. S. Gov., Joint Army-Navy Specification JAN-S-44; 1944. Shock Testing Mechanism for Electrical Indicating Instruments (2 1/2 and 3 1/2 Inch, Round, Flush Mounting, Panel-Type).

U. S. Gov., Navy Dept. Specification 17I20; 1943. Instruments, Electrical Measuring: Resistors, Shunts, and Instrument Transformers for.

U. S. Gov., Navy Dept. Specification 17I21; 1942. Instruments, Electrical Measuring, Voltage—Current Indicating: Varmeters, Wattmeters, and Power-Factor Meters.

U. S. Gov., Navy Dept. Specification 17I22; 1941. Instruments, Electrical Measuring Circuit-Characteristic Indicating; Voltage-Testers, Frequency and Phase-Rotation.

U. S. Gov., Navy Dept. Specification 17I23; 1941. Instruments; Electrical Measuring, Temperature Indicating.

U. S. Gov., Navy Dept. Specification 17-I-25a; 1944. Instrument Assemblies; Circuit Analyzing Equipment, Volt-Ohm-Milliammeters, and Power Circuit Analyzers.

U. S. Gov., Navy Dept. Specification 17-I-44; 1944. Instruments, Electrical Measuring, Electron-Power-Tube Testing.

U. S. Gov., Navy Dept. Specification 18-I-8a; 1944. Instruments, Electrical Measuring, Hydrogen-Gas Indicating, Nonportable (Submarine Use).

U. S. Gov., Navy Dept. Specification 18-I-9a; 1944. Instruments; Electrical Measuring, Combustible-Gas Indicating, Portable.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-27226-E; 1943. Meter; Electric (Aircraft) Direct-Current, General Specification for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-515A; 1930. Instrument; Electrical Indicating, 3.5-Inch and 2.5-Inch Diameter.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1661; 1943. Test Set I-199; Dynamotor.

714.4 PANELS, PANEL BOARDS, SWITCHBOARDS

714.40 General Items

714.41 Panels and Panel Boards

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 17, 18, and 19; 1944. Panel-Connector, Electrical. For Nos. 6, 8, and 10 posts, and for 1/4, 5/16, and 3/8 posts. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 45; 1944. Panel Assembly; Electrical Connector. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 191; 1944. Panel Assembly; Molded-in Screw, Electrical. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Panel Boards. Location, clearances, accessibility, grounding requirements, construction of noncombustible materials,.arrangement of switches and fuses, distances between live parts.

National Electrical Manufacturers Assn., 42-82; 1942. Instructions for the Installation, Operation, and Care of Panelboards.

Underwriters' Laboratories, Inc. Standard for Panelboards, 1941. Requirements in general and for enclosure, bases, current-carrying parts, switches, circuit-breakers, fuses, spacings, wire space, wiring compartments, provision for grounding, insulation resistance, rating, marking, and inspection of listed products.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-58; 1944. Panelboard; Eight Circuit Distribution.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-59; 1944. Panels; Airport Lighting Control.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-147. Cabinet and Panel Board, 3-wire, 220/110 V. for Lighting and Feeder Distribution.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-165. Cabinet; Push Key, 6-Key for Teletype Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-419. Runway; Contact Lighting Control Panel.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-440. Cabinet; Type "O" With Switch and Relay.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment. Comprising part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators; and the grounding rules of the fifth edition, National Electrical Safety Code. For panel boards (sec. 33), requirements on accessibility and convenient attendance, location and illumination, arrangement and identification, spacings, barriers, covers, grounding of frames, guarding current-carrying parts, arrangement of equipment, material, marking, and protection against moisture. Also location of panel boards in residences.

U. S. Gov., Federal Specification W-P-131a; 1941. Panelboards; Equipped With Automatic Circuit Breakers. Covers only one type, viz, the automatic circuit-breaker type for protection of light and/or power circuits and comprises two classes—(1) with circuit breakers having an a.c. rating not exceeding 600 volts and/or d.c. rating not exceeding 250 volts; (2) with circuit breakers having an a.c. rating not exceeding 250 volts, and not suitable for use on d.c. Gives requirements for current-carrying parts, mechanical construction, grounding, arrangement of circuit breakers on panelboards, barriers and insulation, operation, rating, calibration, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification W-P-146; 1936. Panelboards; Equipped With Fuse Connections, or Switches and Fuse Connections. Covers panelboard for the protection of light and power circuits and comprises two classes—fuse distribution panelboard and fuse-circuit panelboards. Gives detail requirements; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-W-P-146; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.), removed requirements to use cadmium plating and requires zinc coating be done by sherardizing or electroplating.

U. S. Gov., Navy Dept. Specification 17C18; 1944. Control Panels; Welding (for Direct-Current Electric Arc Welding Outlets, Constant Potential System).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-543B; 1938. Panel; Type BD-( )-61, Control, Battery Charging.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-630; 1932. Panel; Type BD-68, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-696A; 1940. Panel, Type BD-75, and Terminal Strip TM-192, Wire Communication Cross Connecting.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-996; 1941. Panel; Type BD-98, Power.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1008; 1941. Panel; Type BD-97, Main Distributing Frame.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1017-B; 1944. Panel BD-90 (Power).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1610; 1943. Panel; BD-132-( ), Power.

References.—Telephone jack panel, *see* 718.22; slate for electrical purposes, see 511.53; cabinets for panel boards, *see* 715.12; wiring practice, *see* 715.30; definitions, symbols, standard voltages, service standards, safety codes, methods of test, *see* 710; switchboards, *see* 714.42.

714.42 Switchboards

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Switchboards. Covers installation and location, construction, equipment, grounding, arrangement, overcurrent protection, meter scales, switches, fuses, bus bars, lugs, insulation voltage test, and spare parts.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 107-39; 1944. Switchboard. For the control and distribution of electric power in railway signal service. Covers design, panels, crucible and metal clad type switchboards, supporting framework, instruments, transformers, fuses, circuit breakers, switches, connections and terminals, handles and buttons, plates, finish, insulation, dielectric requirements, identification, inspection, tests, packing, marking, and warranty.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Switchboards and Panel Boards. Of noncombustible material, location, clearances, accessibility, grounding requirements, insulation of wires, overload protection, and grounding requirements for instruments.

National Electrical Manufacturers Assn. Power Switching Equipment Standards 41-65; 1940. These standards cover manufacture, test, and performance of power switching equipment; general requirements, bus supports and air switches, outdoor substations, high voltage a-c fuse cutouts, current-limiting resistors, definitions of terms, and instructions for installation, operation, and care.

Underwriters' Laboratories, Inc. Standard for Dead-Front Switchboards; 1938. Covers dead-front switchboards for use on lighting and power circuits in accordance with the National Electrical Code. They are designed particularly to provide safety for the operator, but they are not necessarily dead-back boards. They are units which are substantially complete when shipped from the factory and whose final acceptability as switchboards in service does not depend to any great extent upon the method of installation and assembly of parts in the field. Does not cover preset and dimmer-control types such as theater switchboards; switchboards which are wholly or partly of the live-front type; automatic or supervisory switchboards; railway-control or electrification switchboards; generating station or substation switchboards; metal-clad, lift-up equipment, trucks, power cubicles, switch houses, etc.; switchboards consisting largely of oil circuit breakers; nor switchboards having horsepower ratings, current ratings of more than 600 amperes per branch-circuit switch (or circuit breaker), or potential ratings of more than 600 volts. Materials, mechanical assembly, framework and enclosure, provision for mounting, insulating material bases for support of current-carrying parts; wiring; manual switching means; spacings; wiring space; corrosion protection; grounding; heating; overload; endurance; dielectric strength; rating; marking; and inspection of listed product.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-3a; 1942. Switchbox Assembly; Four 100 Ampere Circuits.

U.S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. Also apply to similar equipment if installed in factories, mercantile establishments, vehicles, or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. For switchboards (sec. 17), requirements on location and accessibility, material and illumination, necessary equipment, arrangement and identification, spacings and barriers against short-circuit, grounding of switchboards, guarding live parts on switchboards, and instrument cases.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for Installation and Maintenance of Electric Utilization Equipment. Comprising part 3—for 25-to 270-volt equipment which is accessible to other than qualified electrical operators; and the grounding rules of the fifth edition, National Electrical Safety Code. For switchboards (sec. 33), requirements on accessibility and convenient attendance, location, illumination, arrangement, identification, spacings, barriers, covers, grounding of covers, guarding current-carrying parts, and arrangement and location of fuses.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-31-B; 1942. Switchboard BD-15.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-910; 1937. Switchboard; Type BD-70.

References.—Controllers, resistors, fuses, *see* 714.11, 714.12, 714.2; instruments, instrument transformers, *see* 714.3, 713.5; circuit breakers, switches, *see* 714.51, 714.52; telephone panels, *see* 718.22; slate for electrical purposes, *see* 511.53; steel plates and sheets, *see* 604.1, 604.2; copper wire, *see* 715.44; definitions, symbols, standard voltages, methods of test, service standards, safety codes, *see* 710; relays, *see* 714.14.

714.5 SWITCHES AND CIRCUIT BREAKERS

714.50 General Items

American Society for Testing Materials, B182-43T; 1943. Tentative Method for Life Test of Electrical Contact Materials. Covers procedure for the determination of the life of materials used for electrical contacts.

Gives requirements for apparatus, power supply, preparation of test specimens, procedure, and report.

Electrical Standards Committee of the American Standards Assn., sponsor, C37.8. Proposed American Recommended Practice. Standard Rated Control Voltages. Manual, solenoid or motor operation. Table 5, direct current. Table 6, alternating current.

National Electrical Manufacturers Assn. Power Switchgear Assemblies Standards, 44-92; 1944. Provides practical information concerning construction, test, performance and manufacture of equipment for the control and protection of apparatus used for power generation, conversion, transmission, and distribution.

714.51 Circuit Breakers

American Institute of Electrical Engineers, 19; 1943. Alternating-Current Power Circuit Breakers. Applies to all indoor or outdoor types of alternating-current power circuit breakers rated in excess of 600 volts. Covers service conditions, definitions, construction, qualifying terms, rating, heating, and dielectric tests.

American Institute of Electrical Engineers, 20; 1930. Air Circuit Breakers. For indoor a.c. and d.c. air circuit breakers exclusive of enclosed types; definitions, rating, temperature limitations, and dielectric test requirements.

Assn. of Edison Illuminating Companies. Oil Circuit Breakers, 1939. Specifications apply to oil circuit breakers having rated interrupting capacities over 50,000 kva, both indoor and outdoor, and in the following voltage classes: (a) Indoor, under 34,500 volts and (b) outdoor, over 15,000 volts; conforms to latest standards of the American Institute of Electrical Engineers; requirements for power carrying circuit, arc-interrupting mechanism, insulation structure, opening and closing mechanisms, operating features, instrument transformers and wiring, supporting structure and tests.

Electrical Standards Committee of the American Standards Assn.. sponsor, C 37-4. Proposed American Standard. Alternating-Current Power Circuit-Breakers. Apply to all indoor and outdoor types of alternating-current power circuit-breakers rated in excess of 600 volts, service conditions, definitions, rating, heating, dielectric tests, and nameplate markings.

Electrical Standards Committee of the American Standards Assn., sponsor, C 37.6. Proposed American Recommended Practice. Schedule of Preferred Circuit-Breaker Ratings (Applicable to Oil Circuit-Breakers Only). Preferred interrupting ratings, 60-cycle ampere ratings and short time ampere ratings for oil circuit-breakers and metal-clad switchgear. Table 1, outdoor breakers. Table 2, indoor breakers.

Electrical Standards Committee of the American Standards Assn., sponsor, C37.7. Proposed American Recommended Practice. Operation Duty (Duty Cycle) for Standard and Reclosing Service Applicable to Oil Circuit-Breakers Only. Percentages for determining the interrupting rating for oil circuit-breakers at various operating duties. Table 3, oil-tight oil circuit-breakers. Table 4, nonoil-tight oil circuit-breakers.

Electrical Standards Committee of the American Standards Assn., sponsor, C37.9. Proposed American Recommended Practice. Test Code for Oil Circuit-Breakers (Applicable to Oil Circuit-Breakers Only). General considerations and recommendations relative to oil circuit-breakers, review of field tests, effects of laboratory characteristics and testing procedure, transient recovery voltages and transient recovery voltage rates, effect of power factor on circuit-breaker performance, interpretation of oscillograms, comparison of types of operations and tripping schemes upon circuit-breaker performance, current transformers and shunts for short-circuit measurements, bibliography.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Circuit-Breakers. General structural and trip device requirements, location, approved applications, and current setting requirements, fuse and circuit breaker capacity requirements for lighting and appliance branch circuits and for motor circuits.

National Electrical Manufacturers Assn. Large Air Circuit Breaker Standards, 43-90; 1943. These standards provide practical information concerning manufacture, test, and performance of power circuit breakers.

National Electrical Manufacturers Assn. Power Circuit Breaker Standards, 43-91; 1943. Covers oil breakers including terminal bushings from 600-volts upward and in all interrupting ratings, attachments for these breakers, such as bushing current transformers, bushing potential devices, interlocks, etc. Air circuit breakers in excess of 1200 volts applied in a.c. circuits where oil circuit breakers are ordinarily used, and terminal bushings; attachments such as interlocks, under-voltage devices, shunt trips, etc. Also includes liquid circuit breakers other than oil.

Underwriters' Laboratories, Inc. Standard for Branch-Circuit and Service Circuit-Breakers, 1942. Covers circuit-breakers specifically designed to provide service-entrance, meter-service, or branch-circuit protection in accordance with the National Electrical Code. Gives requirements for frame and enclosure, corrosion protection, bases, current-carrying parts, operating mechanism, spacings, wiring space, barriers, performance, rating, marking, inspection of listed product, instructions to inspectors, labels, and inspection reports.

U. S. Gov., Army Air Forces. Specification 32449 (2); 1944. Circuit Breaker; Reverse-Current.

U. S. Gov., Army Air Forces. Specification 32502; 1944. Circuit Breaker; Three Pole, Type A-1, 400 Cycle, Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-77a; 1944. Circuit Breakers; Single Pole Non-Trip-Free.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-148. Circuit-Breaker for Radio Transmitter Control Switchboard.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-422. Circuit Breaker, Oil, Motor-Operated, Los Angeles Airports.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. They also apply to similar equipment if installed in factories, mercantile establishments, vehicles, or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code.. For circuit-breakers (sec. 16), requirements on where automatic circuit-breakers are required, arcing or suddenly moving parts, grounding noncurrent-carrying parts, and guarding live parts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H33; 1940. American Standards Assn. C2.3-1941. Safety Rules for Installation and Maintenance of Electric Utilization Equipment. Comprising part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators; and the grounding rules of the fifth edition, National Electrical Safety Code. For circuit-breakers (sec. 32), requirements on accessibility, marking, installation, where required, character, disconnection before handling, arcing or, suddenly moving parts, guarding live parts, and enclosures.

U. S. Gov., Navy Dept. Specification 17B1c; 1940. Circuit-Breakers; Air, Electric (Shipboard Use).

References.—Oil for oil circuit breakers, *see* 504.8; definitions, symbols, rating basis, standard voltages, methods of test, installation, service standards, safety codes, *see* 710; circuit breakers in conjunction with controllers, *see* 714.11; power switching and automatic switchgear equipment, metal clad switchgear, *see* 714.50.

714.52 Switches

American Institute of Electrical Engineers, 22; 1942. Air Switches and Bus Supports. Apply to all types of air switches and bus supports above 600 volts, for indoor or outdoor service, but not to air circuit-breakers. Definitions, classification, rating, temperature limitations, and dielectric test.

American Institute of Electrical Engineers, 27; 1942. Standards for Switchgear Assemblies. Cover assemblies of switchgear devices such as switches, interrupting devices, control, metering, protective and regulating equipment with associated interconnections and supporting structures.

American Standards Assn., C75.15-1944. Toggle Switches, American War Standard. Covers applicable specifications and drawings, classification, material and workmanship, general requirements and detail requirements; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment; requirements applicable to individual government departments, notes and drawings.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Switches. Open knife switches, spacing of parts and break distances for switches up to 600 volts, installation, mounting positions, method of connection, and operation requirements. Snap switches, material of sub-base, clearance of wires.

National Electrical Manufacturers Assn. Enclosed Switch Standards, 42-78; 1942. Covers air-break switches, having their current-carrying parts enclosed in metal cases, manually operable by means of external handles and enclosed switches with or without provision for plug or cartridge enclosed fuses. Gives general standards, performance, ratings, and marking.

Radio Manufacturers Assn. On-Off Switches, M4-600 to M4-604; 1932. Gives standard positions for on and off, vertical, horizontal, push-pull, and rotary switches.

Radio Manufacturers Assn. High Frequency Switches, M4-651 and M4-652; Rotary Circuit Switches, M4-661 to M4-679; and Push Button Circuit Switches, M4-691 to M4-698; 1941. For radio receivers, standard diameter of shaft extension, tolerance, set-screw and push-on types, and length of flats; mounting bushings and nuts, locking projections, size, and location,

Underwriters' Laboratories, Inc. Standard for Construction and Performance Under Test of Elevator Hoistway Electrical Limit Switches, 1922. Minimum requirements for hoisting limit switches which are in the control circuit of electric elevators. Design and construction, practicability, durability, strength, reliability of operation, fire and accident prevention features, and uniformity.

Underwriters' Laboratories, Inc. Standard for Enclosed Switches, 1936. Covers air-break hand operated, enclosed switches used in accordance with the National Electrical Code. Cast or sheet metal boxes, doors, latches, operating mechanism, insulation, fusing, sizes, performance, heating, overload, endurance, rating, marking, and dielectric strength.

Underwriters' Laboratories, Inc. Standard for Knife Switches, 1939. Covers open knife switches for use in accordance with the National Electrical Code. Covers switches with or without fuse-holders; switches having individual bases designed for either front or rear wiring connection; and switch parts without bases designed for mounting on switchboards and panelboards. Switches may be single- or multi-pole, and with or without quick-break or auxiliary contacts, except where such contacts are specifically required. Bases, current-carrying parts, spacings, performance, rating, marking, and inspection of listed product.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-7; 1943. Switches; Generator Control Relay.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-20a-1; 1945. Switches; Aircraft Toggle.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-39a; 1944. Switches; Low Travel Limit.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-42-1; 1944. Switches; Generator Control Relay (Differential).

U. S. Gov., Army-Navy Aeronautical Specification AN-S-45; 1944. Switches; Voltmeter Selector.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-47; 1944. Switches; Shielded Ignition.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-264. Control Panel; Teletype.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-489. Control Switch; Light Sensitive.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. Also apply to similar equipment if installed in factories, mercantile establishments, vehicles or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electrical Safety Code. For switches (sec. 16), requirements on accessible and indicating, oil switches, where switches are required, capacity, arcing or suddenly moving parts, grounding noncurrent carrying metal parts, and guarding live parts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment. Comprising part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators; and the grounding rules of the fifth edition, National Electrical Safety Code. For switches (sec. 32), requirements on accessibility, marking, installation, special circuits, control, hazardous locations, where required, character, disconnection before handling, arcing or suddenly moving parts, grounding noncurrent-carrying metal parts, guarding live parts, enclosed air-break switches (not including snap switches), and control equipment.

U. S. Gov., Federal Specification W-S-871; 1935. Amendment 1; 1936. Switches; Knife, Open-Type, Front and Rear-Connected. Covers two types—A, heavy duty knife switch of milled and machine-made built-up construction; and C, medium duty knife switches made from punched and bent-up parts, front and rear connected, mounted on individual bases. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-W-S-893; 1942 (issued by Procurement Div., Treasury Dept., U. S. Gov.), changed detail requirements.

U. S. Gov., Joint Army-Navy Specification JAN-S-57; 1944. Switches; Vacuum.

U. S. Gov., Navy Dept. Specification 17C16b; 1944. Contact-Makers; Motor-, Pressure-, and Temperature-Operated, Interior-Communication and Fire-Control.

U. S. Gov., Navy Dept. Specification 17S13a; 1935. Switches; Toggle, Low-Voltage (Aircraft Use).

U. S. Gov., Navy Dept. Specification 17S16a; 1944. Switching Equipment; Bus-Transfer, Magnetically and Manually Operated.

U. S. Gov., Navy Dept. Specification 17S18b; 1941. Switches; Electric, Hand-operated, Miscellaneous Special-Purpose Designs.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-350; 1943. Switch; Selector, Diaphragm Actuating, Type A-2, Manually Operated.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-7700; 1944. Switches; Rotary Stepping, Submarine Mine.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-801B; 1936. Disconnector; Type PL-53, Aircraft Headset Cord.

References.—Lighting snap switches, *see* 715.22; magnetic switches, knife switches, and contactors in conjunction with controllers, *see* 714.11; switch boxes and inclosures, *see* 715.12; slate for electrical purposes, *see* 511.53; porcelain for electrical purposes, *see* 532.22; definitions, symbols, rating basis, standard voltages, methods of test, service standards, safety codes, *see* 710; power switching and automatic switchgear equipment, metal clad switchgear, *see* 714.50.

715. TRANSMISSION AND DISTRIBUTION APPARATUS

715.1 CONDUITS AND SWITCHBOXES

715.11 Electric Conduit, Wire Raceways, And Fittings

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 52; 1942. Conduit Assembly—Electrical, Shielded, Flexible. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

American Transit Assn. Recommended Specification and Form of Contract for Electrical Conduit Construction, D121-41; 1941. Gives a general statement concerning underground electrical conduit manholes, fireproofing of cables, cable racks, damage due to cable failure, and gives recommendations for proposal sheet, contract, general conditions of contract, specifications for materials, construction, appendix covering tile duct, and appendix covering fibre duct.

Assn. of American Railraods, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Specification for Fibre Conduit. The recommended specification for fibre conduit is current Federal Specification for Conduit and Fittings; Fiber Bituminized. Type I, to be encased in concrete; and type II, not to be encased in concrete.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 36-13; 1913. Steel Pipe Conduit. General quality of soft steel conduit, dimensions according to Briggs standard for pipe, bends, coating requirements, tension, hydrostatic and flattening tests, acid test for enamel, zinc coatings, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 37-13; 1913. Wrought Iron Pipe Conduit. Fabrication from hand-puddled pig iron without scrap, follows Briggs standard for pipe; pipe coating, fittings, tensile strength, galvanizing, enamel, and marking.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 57-39; 1939. Trunking and Capping. For wood trunking and capping used as conduit for insulated wire, in railway signal service. Size and finish, Norway, yellow pine, cedar, cypress and redwood, lists defects, etc.

International Municipal Signal Assn., Inc. Equipment Specification 104; 1942. Fibre Conduit, Fittings and Bends. Covers underground conduit for installation in ground with or without concrete encasement. Material furnished under this specification shall be in accordance with Federal Specifications W-C-581. Gives requirements for type, sizes and dimensions, material and workmanship, and conduit.

International Municipal Signal Assn., Inc. Equipment Specification 105; 1942. Surface Metal Raceways. Covers inside building wiring and shall apply to surface metal raceways for use in fire stations, police stations, and other places where extensions to the municipal signaling circuits are made and which is recommended in lieu of open wiring of such systems. Gives requirements for definitions, classification, material and workmanship, methods of sampling, inspection and tests, packaging, packing and marking, and notes.

National Board of Fire Underwriters. American Standards Assn., C1-1940. National Electrical Code, 1940. Construction dimensions and number of conductors permitted for rigid and flexible conduit and raceways. Installation and accessories.

National Electrical Manufacturers Assn. Conduit Fittings, Cable Fittings, and Accessories Standards, 42-80; 1942. The manufacturing, material and performance requirements of electrical raceway fittings and cable fittings. Covers fittings for rigid conduit, flexible metallic conduit, electric metallic tubing, oval tubing, service entrance cable, armored cable, and nonmetallic sheathed cable.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S.A.E. Recommended Practice for Nonmetallic Conduit. Revised, 1932. Reviewed, 1936. General information, construction, dimensions, saturation, tensile requirements, finish, tests, and fireproofing.

Underwriters' Laboratories, Inc. Standard for Electric Metallic Tubing, 1942. Covers electrical metallic tubing for use as a metal raceway for the installation of wires and cables in accordance with the National Electrical Code. Includes requirements for tube, protective coatings (zinc and enamel), dimensions and weight, elbows and bends, finished product, marking, inspection of listed product, labels, and inspection reports.

Underwriters' Laboratories, Inc. Standard for Electrical Fittings for Use in Hazardous Locations; Class I, Group D, 1941. Applies to electrical fittings such as conduit boxes for housing of conductors, terminals, and splices, conduit unions, fixture fittings, and conduit fittings, for sealing, for use in class I locations as defined in article 500 of the National Electrical Code. Material, strength, joints, bolt spacing and location, connections, marking, explosion tests, hydrostatic tests, and inspection of listed products.

Underwriters' Laboratories, Inc. Standard for Flexible Nonmetallic Tubing, 1939. Covers flexible nonmetallic tubing to be employed as a mechanical protection to insulated wires in accordance with the rules of the National Electrical Code. Materials and assembly, double-wall tubing, sizes, tension, moisture absorption, flame-retardant properties, kinking and flattening, flexibility, dripping of compound, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Flexible Steel Conduit, 1938. Covers flexible steel conduit designed for use as a metal raceway in the installation of wires and cables in accordance with the National Electrical Code. Gives requirements for strip material, interior surfaces, internal diameter, external diameter, weight of conduit, zinc coating, tension, flexibility, marking, inspection of listed product, instructions to inspectors, labels, and inspection reports.

Underwriters' Laboratories, Inc. Standard for Rigid Steel Conduit, 1942. Covers rigid steel conduit for use as metal raceway for the installation of wires and cables in accordance with the National Electrical Code. Gives requirements for tube, protective coatings, threading and reaming, straight conduit, nipples, elbows and bends, couplings, finished product, identification of conduit, marking, instructions to inspectors, labels, and inspection reports.

Underwriters' Laboratories, Inc. Standard for Surface Metal Raceways and Fittings, 1940. Covers metal raceways and fittings for surface wiring for use in accordance with the National Electrical Code. Design and construction, material, dimensions, fittings, corrosion protection, electrical conductivity, installation, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Underfloor Raceways and Fittings, 1943. Covers metallic and nonmetallic underfloor duct system wiring in accordance with the National Electrical Code. Gives conditions for general requirements, metallic duct, nonmetallic duct, boxes and fittings, installation accessories and instructions, inspection of listed product, labels, inspection reports, and field inspection.

Underwriters' Laboratories, Inc. Standards for Wireways, Auxiliary Gutters, and Associated Fittings. Does not cover rigid or flexible conduit, surface raceways, or underfloor raceways. Gives general requirements, design and construction (including material, thickness of metal, flanges and reinforcing strips, knockouts, covers, hinges and latches, supports, and corrosion protection), and inspection of listed product (including general, labels, cost of service, necessary co-operation from the manufacturer, use of name of Underwriters' Laboratories, Inc., test equipment at the factory, and instructions to inspectors).

U. S. Gov., Federal Specification W-C-571; 1942. Conduit and Fittings; Asbestos-Cement (for) Electrical Purposes. Covers two types—(I) for use encased in concrete after installation and (II) for use without encasement in concrete. Sizes,-2, 2 1/2, 3, 3 1/2, 4, 4 1/2, 5, and 6 in. Gives requirements for lengths, thickness of wall, flexural strength and crushing strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification W-C-581; 1939. Conduit and Fittings; Fiber, Bitumized. Covers two types—(I) for use encased in concrete (sizes-1, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 4 1/2, 5, and 6 in.), and (II) for use without encasement in concrete (sizes 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 4 1/2, and 5 in.). Gives requirements for material, workmanship, bore, joints, length and wall thickness, water absorption, chemical properties, boiling, heat resistance, crushing strength, beam strength, and impact strength; methods of inspection and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification W-F-106; 1937. Amendment 1; 1941. Fittings; Cable and Conduit. Covers six types—for rigid steel conduit, electrical metallic (steel) tubing, for armored cable, for oval steel tubing, for service-entrance cable, and for nonmetallic sheathed cable; and the following classes—bar hangers, bar hanger assemblies, connectors (for cable, for armored and flexible metallic conduit, and for nonmetallic sheathed cable), conduit lock nuts, conduit bushings, capped conduit bushings, conduit unions, bush nipples (chase type), conduit straps and clamps, fixture studs, fixture hickeys, fixture extensions, entrance caps, entrance elbows, insulated and fittings, grounding and bonding fittings, conduit reducers and enlargers, conduit angle adopters, conduit entrance ells, threadless fittings, and oval-tubing fittings. Covers fittings of trade sizes-3/8, 1/2, 1, 1 1/4, 3/4, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 4 1/2, 5, and 6 in. Gives detail requirements for each type and class; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification W-F-406; 1937. Amendment 2; 1944. Fittings; Cable and Conduit. Covers 6 types—rigid steel conduit, electrical metallic (steel) tubing, armored cable, oval steel tubing, service-entrance cable, and nonmetallic sheathed cable; 22 classes; and 14 sizes. Gives requirements for material, workmanship, and details for each type, class, and size; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification W-R-32; 1942. Raceways and Fittings; Metallic, Surface. Covers one type in three sizes. Gives requirements for material, workmanship, design, wall thickness, length, supports, fastenings, connections, fittings, corrosion protection, zinc and enamel coatings, electrical conductivity, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification W-R-36; 1937. Raceways and Fittings; Metallic, Underfloor. Covers metallic underfloor duct system designed for use as raceways for the installation of wires and cables. Gives requirements for size, material and workmanship, ducts, installation of metallic duct, inserts, protective coating of ducts and preset inserts, junction boxes, fittings, duct supports, protective coating for boxes and fittings, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification W-R-41; 1937. Raceways and Fittings; Non-Metallic, Under-floor. Covers duct systems of closed and open-bottom types designed for use as raceways for the installation of wires and cables. Gives requirements for sizes, material and workmanship, nonmetallic duct, installation of nonmetallic duct, inserts, junction boxes, fittings, duct supports, protective coating for boxes and fittings, and marking; methods of sampling, inspection and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification WW-C-566; 1941. Conduit; Steel, Flexible. Stipulates compliance with Underwriters' Laboratories "Standard for Flexible Steel Conduit." Gives requirements for types, sizes, material and workmanship, thickness, internal diameter, weight, corrosion protection, strength, and flexibility; methods of sampling, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification WW-C-571; 1933. Conduit; Steel, Rigid, Enameled. Gives requirements for enamel coating, threading and reaming, couplings, length, weight, wall thickness, pitch of threads, variation in length of thread, taper of threads, and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification WW-C-581a; 1935. Amendment 2; 1939. Conduit; Steel, Rigid, Zinc-Coated. Gives requirements for material, workmanship, zinc-coating, threading and reaming, couplings, length, weight, wall thickness, pitch of threads, variation in length of thread, taper of threads, fittings, and elbows and nipples; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification WW-T-806a; 1935. Amendment 1; 1944. Tubing; Electrical, Metallic. Gives requirements for material, workmanship, zinc coating, dimensions, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-313A; 1925. Conduit; Fiber, for Underground Wires and Cable.

References.—Nonmetallic flexible conduit, *see* 715.13; methods of testing and general requirements for metals, *see* 600.1; zinc coatings, *see* 600.3; standard pipe sizes and threading, *see* 607.0: other wrought iron and steel pipe, *see* 607.3, 607.4; lumber grading rules, *see* 400.2, 400.3; wood preservation, preservatives, *see* 400.42, 801.3; cement, gravel, and sand, *see* 516.1, 512.1; reinforcing steel, *see* 605.25; clay sewer pipe, methods of testing clay products, *see* 531.5, 531.0; sheet steel, *see* 604.22, 604.23.

715.12 Switch Boxes, Outlet and Junction Boxes, Cabinets

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-21; 1926. Metal Boxes. Design and construction of boxes for test panel, resistance, terminal, and protector cabinets; gage of sheet metal based on size of box, hardware, and finish requirements for hinged cover and lift-off cover boxes.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-70; 1932. Metal Battery Cabinets ARA-6-A and ARA-7-A. Gives general requirements, material and workmanship, dimensions, inspection and tests, packing, marking, and warranty.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Boxes, Cabinets, and Outlet and Terminal Fittings. Requirements for protective coatings, minimum thickness of metal on small boxes, construction and required clearances of current carrying parts for cabinets and cutout boxes of metal or lined wood, minimum depth of outlet boxes, installation requirements of boxes, cabinets, outlet and terminal fittings.

National Electrical Manufacturers Assn. Distribution Cutout Standards 38-53; 1938. Gives requirements for rating standards, performance, mounting and assembly, test manufacture, brown porcelain insulators, dimensions of fuse links, and classification of insulating materials for enclosed and open type cutouts. Change (Sept. 9, 1942) for duration of emergency reduced overall length of universal fuse links (0 to 15 kv) for distribution cutouts from 23 to 20 in. (minimum).

National Electrical Manufacturers Assn. Distribution Cutout and Power Fuse Standards, 44-93; 1944. Gives rating standards, performance standards, application standards, and manufacturing standards for distribution cutouts, fuse links, and power fuses; definitions including general, parts, classification by construction, mounting and operation, rating, performance and test, and miscellaneous; and instructions for the installation, operation, and care of distribution cutouts and power fuses.

Underwriters' Laboratories, Inc. Requirements for Cabinets and Cutout Boxes, 1941. For enclosures either surface or flush mounted provided with swinging doors, to be used in accordance with the National Electrical Code. Covers cast and sheet metal boxes, outdoor use, hinges, latches, knockouts, labels, etc.

Underwriters' Laboratories, Inc. Standard for Outlet Boxes and Fittings, 1941. Covers outlet boxes, armored cable boxes, conduit boxes, flexible nonmetallic boxes, floor outlet and flushdevice boxes, junction boxes, nonmetallic sheathed cable boxes, pull boxes, extension rings, and covers. Requirements as to strength and rigidity of material, corrosion, support, connection, grounding, studs, clamps and fasteners, weatherproof boxes, and marking. This standard was approved as American standard C33a-1929 by the American Standards Assn.

Underwriters' Laboratories, Inc. Standard for Service Equipment, 1936. Addenda, 1940. Includes service-entrance switches, meter-service switches, service circuit-breakers, meter test blocks, and combinations with branch circuit fuses and circuit breakers. Enclosures, cast and sheet metal, operating mechanism, switches, current carrying parts, disconnecting means, fusing, capacity, spacings, wiring space, barriers, grounding, performance, overload, endurance, dielectric strength, rating, voltage and current, and marking.

Underwriters' Laboratories, Inc. Standard for Underfloor Raceways and Fittings, 1943. Covers metallic and nonmetallic underfloor duct system wiring in accordance with the National Electrical Code. Gives conditions for general requirements, metallic duct, nonmetallic duct, boxes and fittings, installation accessories and instructions, inspection of listed product, labels, inspection reports, and field inspection.

U. S. Gov., Army Air Forces. Specification 32321 (2); 1942. Cabinet; Power Control.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-59a-1; 1943. Cubicle; Manual Transfer Primary Switch 300/100 KVA.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-60a-1; 1943. Cubicle; Automatic Transfer Primary Switch 300/100 KVA.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-109; 1944. Cabinet and Relay Assembly: Runway Selector.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-123; 1944. Cabinet and Relay Assembly; Distribution.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-48-1; 1945. Switch Boxes; Caging, for Gyro Flux Gate Compass.

U. S. Gov., Federal Specification W-B-616; 1938. Amendment 1; 1944. Boxes and Outlet-Fittings, Floor; (for) Rigid-Steel-Conduit and Electric-Metallic-Tubing (Steel). Covers four types—(I) adjustable floor boxes, (II) semiadjustable floor boxes, (III) nonadjustable floor boxes, and (IV) floor-outlet fittings; and three classes—(A) watertight (universal), (B) watertight (embedded in concrete), and (C) surface-tight. Gives requirements for sizes, material, workmanship, bodies, cover plates, floor-outlet fittings, and marking; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification W-O-806; 1937. Amendment 1; 1944. Outlet-Bodies; Iron (Cast or Malleable), Cadmium or Zinc-Coated, With Covers and Accessories (for Shore Use). Includes several types, such as bodies primarily intended to provide turns, offsets, and branches in rigid steel conduit and electrical metallic steel tubing systems, but which may be used as wire outlets or as mountings for lamp receptacles, rosettes, convenience outlets, and to enclose wire splices, etc; and also bodies for mounting or enclosing surface-wiring devices. Gives requirements for classes, sizes, material and workmanship, and detail requirements; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Federal Specification W-O-821a; 1937. Amendment 2; 1944. Outlet Boxes, Steel, Cadmium or Zinc-Coated, With Covers and Accessories. Covers one type with extension rings, clamps, and fasteners, either fabricated so that boxes can be ganged, or formed in one piece. Gives requirements for classes, sizes, material and workmanship, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-2050; 1933. Box, Junction, for 1-Conductor Submarine Mine Cable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-65-A; 1927. Switchbox, Types BE-45, BE-46; and BE-47, for Telephone Circuits.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-92; 1921. Junction Boxes; Types JB-3 and JB-5.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-107B; 1931. Switchbox; Type BC-117, Cut-Out.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-284B; 1937. Switchbox; Type BE-54A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-536A; 1930. Junction Box; Type JB-14, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-698; 1936. Junction Box; Type TM-170A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-701; 1934. Switchbox; Type BE-60, Telephone Switching.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-871B; 1941. Switchbox; Type BC-345, Filter.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-893; 1940. Switchbox; Type BC-363, Interphone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-974; 1941. Switchbox; BE-73.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-991; 1941. Cabinet; Type BE-79, Main Distributing Frame.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1000A; 1943. Junction Boxes; JB-19 and JB-80.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1001; 1941. Cabinet; Type BE-75, Telephone Power.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1018; 1942. Cabinet; BE-72, Test and Power Distribution.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1146; 1942. Switchbox BC-705.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1662A; 1944. Antenna Cords and Junction Boxes, for Radio Direction Finder Central TC-8 and Radio Intercept Central TC-9.

References.—Inclosures for inclosed switches, *see* 714.52; zinc coatings, *see* 600.3; cast iron, cast brass, cast bronze, *see* 611.11, 645.21, 646.41; steel sheets, *see* 604.22, 604.23.

715.13 Flexible Tubing for Wire Protection

Underwriters' Laboratories, Inc. Coated-Fabric Insulating Tubing, 1942. Covers fabric-base insulating tubing (varnished or lacquer-coated) to be used only for the interval wiring of devices and appliances, rated at 600 volts or less. Gives requirements for base material, wall thickness, dielectric strength, aging test, and flame test.

Underwriters' Laboratories, Inc. Standard for Underfloor Raceways and Fittings, 1943. Covers metallic and nonmetallic underfloor duct system wiring in accordance with the National Electrical Code. Gives conditions for general requirements, metallic duct, nonmetallic duct, boxes and fittings, installation accessories and instructions, inspection of listed product, labels, inspection reports, and field inspection.

U. S. Gov., Army Air Forces. Specification 32012-C (1); 1940. Tubing; Flexible, Nonmetallic Oil-Proof.

U. S. Gov., Federal Specification HH-T-791a; 1940. Tubing; Flexible, Nonmetallic. Covers tubing to be employed as a mechanical protection to insulated wires and cables. Must comply with all requirements of Underwriters' Laboratories. Gives table of sizes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 84-6A; 1930. Tubing; Nonmetallic, Flexible.

715.2 SOCKETS, RECEPTACLES, LIGHTING SWITCHES, ROSETTES

715.21 Sockets, Receptacles, Plugs

American Institute of Electrical Engineers, 21; 1941. Apparatus Bushings (Proposed A. I. E. E. Standard and Proposed Test Code). Covers proposed standard service conditions, rating, definitions, heating, dielectric tests, and name-plate markings; and proposed test code classification of bushing tests and test procedure.

American Society of Mechanical Engineers, joint sponsor with National Electrical Manufacturers Assn. American Standards Assn., C44-1931. Rolled Threads for Screw Shells of Electric Sockets and Lamp Bases. For miniature, candelabra, intermediate, medium, and mogul types, standard pitch, dimensions, shape of threads, gage tolerances.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1940. Charging Receptacles. Recommends 100- and 150-ampere capacity battery charging receptacles, location, description, and diagrams; charging plugs necessary, diagrams, and construction.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1941. Plugs and Receptacles; Standby Service. Covers phase rotation, plugs and receptacles for use in yard and station standby service with 3-phase, 60-cycle power. All standby motors on air conditioned cars shall be connected for operation on 220-volt, 3-phase, 60-cycle power.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. Plugs and Receptacles for Standby Service. Proper phasing of 220-volt, 60-cycle, 3-phase wayside receptacles for use with air conditioning facilities, and adopts the latest revision of phase rotation, plugs, and receptacles for use in yard and station standby service with 3-phase, 60-cycle power, of the Mechanical Div., Electrical Section, designated as Plugs and Receptacles, Standby Service, Section C of the Manual of that section.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Lamp Holding Devices and Plug Receptacles. Classification of lamp sockets, rating method of operation, general construction requirements, installation requirements for sockets, attachment plugs, and receptacles.

National Electrical Manufacturers Assn., sponsor. American Standards Assn., C73-1941. Attachment Plugs and Receptacles. Deals with interchangeable separable attachment plugs, receptacles and connectors to be employed in electric light, heat and power circuits, under the conditions of installation and use prescribed by the National Electric Safety Code. Devices for special application are not to be judged by this standard.

Underwriters' Laboratories, Inc. Standard for Attachment Plugs and Receptacles, 1942. Covers attachment plugs and receptacles, cord connectors, some forms of current taps, and flatiron and appliance plugs for use in accordance with National Electrical Code. Gives requirements for materials, current-carrying parts, terminals, female contacts, assembly, overload, attachment plugs, cord connectors, receptacles, current taps, flatiron and appliance plugs, rating, marking and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Edison-Base Lamp Holders, 1941. Covers Edison-base lamp holders to be employed in accordance with the National Electrical Code. Enclosure, lining, interior, assembly, special features applying to particular types of lamp-holders, performance, rating, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Electrode Receptacles for Gas-Tube Signs, 1940. Material, mounting, drainage, current-carrying parts, spacings, dielectric strength, rating, marking, and inspection of listed product.

U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); American National rolled threads for screw shells of electric sockets and lamp bases (form of thread, thread series, and gages); and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

U. S. Gov., Federal Specification W-R-151; 1934. Amendment 5; 1944. Receptacles (Convenience Outlets); Attachment Plugs, Current Taps, and Connectors. Covers receptacles of 10-ampere 250-volt, 15-ampere 125-volt size, double-pole shall be of double-T-slot duplex type. Gives requirements for classification, sizes, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 17C15b; 1944. Caps, Attachment-Plug, Separable, for Connection to Flexible Electrical Conductors.

U. S. Gov., Navy Dept. Specification 17S4f; 1944. Sockets; Weatherproof.

U. S. Gov., Navy Dept. Specification 17S17; 1940. Sockets; Electric-Lamp for Shipboard Use.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-805F; 1943. Plug PL-54, PL-55, PL-124, PL-125, and PL-354; 2-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-807C; 1941. Plug; Type PL-68, 3-Conductor, Microphone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-853B; 1938. Plug; Cable Connector, Aircraft.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1005; 1941. Plug and Socket.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1119; 1942. Plug, PL-155, 2-Contact, Right-Angled; and Plug PL-168, 3-Contact, Right-Angled.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1169; 1942. Plug PL-179; Magnetic Microphone-Headset.

References.—Sockets for radio vacuum tubes, *see* 718.69; telephone and radio plugs and jacks, *see* 718.21, 718.69; lamp holders for Christmas tree lighting outfits, *see* 716.39.

715.22 Lighting Switches

Underwriters' Laboratories, Inc. Standard for Knife Switches, 1939. Covers open knife switches for use in accordance with the National Electrical Code. Covers switches with or without fuse holders; switches having individual bases designed for either front or rear wiring connection; and switch parts without bases designed for mounting on switchboards and panelboards. Switches may be single- or multi-pole, and with or without quick-break or auxiliary contacts, except where such contacts are specifically required. Bases, current carrying parts, spacings, performance, rating, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Snap Switches, 1941. Covers manually operable snap switches to be employed on light and power circuits in accordance with the National Electrical Code. Does not cover switches rated at more than 30 amperes at 600 volts; switches rated at more than two horsepower at 600 volts or less; nor switches having a potential rating of less than 50 volts unless in conjunction with a rating of 125 or 250 volts. Enclosure, lining, bushings and strain relief, bases and bodies, sealing, current-carrying parts, insulating material, actuating members, assembly, performance rating, marking, and inspection of listed product.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment. Comprising part 3—for 25-to 270-volt equipment which is accessible to other than qualified electrical operators; and the grounding rules of the fifth edition, National Electrical Safety Code. For lighting switches (sec. 32), requirements on accessibility, marking and installation, special circuits, control, hazardous locations, where required, character, disconnection before handling, arcing or suddenly moving parts, enclosed air-break switches (not including snap-on), and control equipment.

U. S. Gov., Federal Specification W-S-890; 1944. Switches; Snap, Miscellaneous. Covers one grade. Must be acceptable to Underwriters' Laboratories, Inc., regarding fire and casualty hazards. Gives requirements for types, classes, circuits, ratings, material, workmanship, general design, assembly, enclosures, current-carrying parts, terminals, operating mechanisms, position indication marking, ratings, color, finish, marking, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification W-S-893; 1943. Amendment 3; 1944. Switches; Snap, Multiple Type and Combination Devices, Flush Type with Wall Plates. Covers one type—multiple-type flush snap switches designed for mounting one or more switch units on a single yoke, and combination devices, for mounting in a single gang switch box flush with the wall or other enclosures and with wall plates as specified. Gives requirements for classification, sizes, bases, wall plates, current-carrying parts, mounting and marking; methods of sampling, inspection and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification W-S-896; 1934. Amendment 3; 1944. Switches; Snap, Single-Unit, Interchangeable Flush-Type With Wall Plates. One type only of the tumbler and toggle class. Gives requirements for sizes, material, construction, wall plates, current-carrying parts, marking, ratings, and mounting; method of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Knife and other type switches, *see* 714.52; automobile lighting switches, *see* 722.32; definitions, symbols, standard voltages, service standards, *see* 710.

715.23 Rosettes

715.3 WIRING AND WIRING SUPPLIES

715.30 General Items

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes; Electric Light Wiring. Gives requirements for conduits, wires, joints, outlet boxes, service switches and cabinets, local switches, fuses, wiring systems, and guarantee.

American Transit Assn. Recommended Practice for Trolley Bus Base and Motor Designation, E127-31; 1931. In wiring trolley buses or reading wiring diagrams for same, the left hand trolley base should be considered as positive. The left hand base is the one on the closed side of the bus. The motor on the right hand or open side of the bus should be designated as No. 1. Where motors are placed in tandem the front motor should be designated as No. 1.

American Transit Assn. Recommended Rules for Wiring of Electric Cars, Trolley Buses and Locomotives, E143-39; 1939. These rules are identical with section 1 of the Regulations of the National Board of Fire Underwriters for Electric Cars and Trolley Buses, including houses and yards. The rules referred to in this specification cover electrical installations, wiring methods, trolley buses, protection of main power circuits, wires and cables, main motors and controls, lighting, electric heating, signaling circuits, storage batteries, and lightning protection for cars.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 119-42, 1943. Wiring. For the purpose of providing installation of wire and cable. Covers drawings, material and workmanship, clearances, common return wire, wire terminals, tagging, line construction, ground leads, cable for direct earth installation, track circuit bonding, inspection, and tests.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-23; 1927. Specification for Dynamometer Testing of Copper Wire. For determining fitness for further use on the line, general causes of defects, and method of measuring stress for location of weakened portions of old line wire.

Assn. of American Railroads, Telegraph and Telephone Section, 2-H-7; 1932. Wire and Cable Distribution in Offices and Buildings. Description and illustrations of standard elements involved in communication and other wiring of office buildings. Includes entrance, riser shafts, distributing cabinets, underfloor distributing systems, floor outlets, and raceways.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-6; 1924. Specification for Soldering Inside Plant. Sequence of operations, materials and tools necessary, and description of method with precautions for use of electric irons and torches.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume 1. Structural Details; 1938. For buildings supporting tanks, requirements as to footings on brick supporting walls, design for anchorage, allowable bearing pressures for supports of various building materials. Concrete buildings according to A.S.T.M. specifications for concrete.

Edison Electric Institute, Illuminating Engineering Society, International Assn. of Electrical Inspectors, National Electrical Contractors Assn., National Electrical Manufacturers Assn., National Electrical Wholesalers Assn., and Radio Manufacturers Assn., sponsors. Handbook of Interior Wiring Design, 1937. Surveys the field of wiring adequacy for buildings. Treats of the electrical needs of the residence, factory, office or store; interprets modern practice in installing wiring; conforms with the requirements of the American Standard Codes set-up for fire prevention and personal safety.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Outside Supply Conductors. Clearances for overhead lines, number of services per building, insulation, protection and clearance of service wires, entrance service wiring and entrance switch installation requirements, grounding.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Wiring Methods, and installation rules, supports, voltage limits, protective guards, conductors per conduit, sizes and insulation of conductors, grounding, dimensions of cleats, knobs, and tubes, installation requirements for open wires, concealed knob and tube work, conduit work, surface metal raceways, armored cable, underfloor raceways, nonmetallic sheathed cable, metallic tubing.

National Electrical Manufacturers Assn. Handbook of Interior Wiring Design, 1937. Covers residence standards of adequacy, chart of outlet requirements, specification form for single dwelling, lighting fundamentals, wiring standards for general occupancies, procedures for lighting and power wiring installations, adequacy standards for multi-family dwellings, and for commercial, public and industrial occupancies, material and installation specifications.

Underwriters' Laboratories, Inc. Standard for Grounding and Bonding Equipment, 1943. Covers grounding and bonding equipment for use in connection with interior wiring systems in accordance with the National Electrical Code. Gives requirements for grounding devices, grounding and bonding bushings, water-meter shunts, armored grounding wire, ground rods, miscellaneous devices, marking, and inspection of listed product.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-86. Combined Telephone and Electric Service.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. Comprising Part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. Also apply to similar equipment if installed in factories, mercantile establishments, vehicles or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the fifth edition, National Electric Safety Code. For conductors (sec. 15), requirements on electrical protection, precaution against mechanical and thermal damage, isolation, guarding, taping ends and joints, and wiring for illumination.

U. S. Gov., Navy Dept. Bureau of Yards and Docks. Specification E-9Ye; 1943. Electrical Apparatus, Distributing Systems, and Wiring. (Emergency Edition.)

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 16Ye; 1941. Refrigerating Equipment. Also includes ice-making equipment. Includes requirements for electric motors, control equipment, and wiring.

References.—Automobile wiring, *see* 722.32; ground clamps, *see* 719.72; Traveling electric crane wiring, *see* 744.1.

715.31 Insulators

References.—Glass pin insulators, *see* 526.1; porcelain insulators for electric lines, porcelain switch and fuse bases, cleats, knobs, *see* 532.22; wood strain insulators, *see* 429.7; wood insulator pins, steel insulator pins, *see* 429.7, 719.61.

715.32 Insulator Pins

Edison Electric Institute. Suggestions for Specifications for Insulator and Pin Threads and Gauges, No. TD-71; 1937. Dimensional drawings showing 1-in. and 1 3/8-in. sizes of thread in insulator, wood pin thread, cast lead pin thread, wire pin thread, pressed steel pin thread, insulator gauge thread, insulator gauges, and cast lead pin thread gauges. Also explanatory notes and tolerances.

References.—Wood insulator pins, *see* 429.7; steel insulator pins, *see* 719.61.

715.33 Insulator Knobs

References.—Porcelain knobs and spool insulators, *see* 532.22.

715.34 Lugs

National Electrical Manufacturers Assn. Suggested Specification for Standard and Heavy Duty Multiple Bolt Soldering Lugs, N.E.M.A. 101; 1932. For determining choice of types, and gives complete dimensions for multiple bolt pressed and heavy duty cast soldering lugs, diameters and spacing of bolt holes, dimensional diagrams for three classes of lugs, and material requirements for 250,000 to 2,000,000 c.m. cable.

Underwriters' Laboratories, Inc. Standard for Soldering Lugs, 1930. For connecting wires or cables and electrical devices used on lighting and power circuits in accordance with the National Electrical Code. For lugs of copper, brass, or bronze; to be cast, stamped or swaged, requirements as to current capacity, diameter, and depth of cable hole, wall thickness, and contact area for various sizes of wire, and marking.

References.—Other lugs and terminals, *see* 715.35; castings of copper, brass, bronze, *see* 642.21, 645.21, 646.41; sheet material of copper, brass, bronze, *see* 641.2, 644.2, 646.2; wiring practice, *see* 715.30.

715.35 Terminals and Tags

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 39; 1943. Terminal; Electrical, Mechanical. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 193; 1944. Solderless (Pressure) Terminals for Electric Cables. Intended for the termination of electric cables of copper for aircraft. Gives classification, material and workmanship, general requirements, detail requirements, procedure for qualification test, and table showing cable size designation, test rating in amperes, maximum millivolt drop at nominal test rating, minimum tensile load and weight to be used on vibrating test.

Radio Manufacturers Assn. Cord Tips, M2-112, M4-111, M4-112; 1930. For cylindrical type and pin type tips, for use on loud speaker and head-set cords, dimensions for various standard sizes, pull test for strength of soldering.

Radio Manufacturers Assn. Cable Terminal, M4-114; 1930. Standard dimensions of spade type cable terminal for outer end of battery connecting conductors on radio receiving sets.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts and Fittings. S.A.E. Standard Cable Terminals. Revised, 1943. To eliminate unnecessary variations in sizes and types of terminals for electrical connections. Gives tables showing sizes and dimensions for stud or screw and hole or slot sizes, straight type A eyelet terminals, offset type A eyelet terminals, side type B eyelet terminals, straight type C spade terminals, side type D spade terminals, and end type E starting cable terminals.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-2b; 1944. Terminals; Steel Cable, for Swaging.

U. S. Gov., Navy Dept. Specification 17C13d; 1944. Connectors and Lugs, Terminal, Pressure-Grip (Solderless, for Electric Cable).

U. S. Gov., Navy Dept. Specification 17L7; 1939. Lugs, Cable-Terminal, Copper, Punched-Tube-Type, for Soldered Connections for Electric Cable.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-25513F; 1936. Terminal, Warped, for Aircraft Cable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-100-C; 1928. Terminal Strip; Type TM-84-A, 5 pair.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-132B; 1927. Terminal; Type TM-88 Cable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-264; 1924. Terminal Strip; Types TM-76 and TM-77.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-436C; 1943. Tag MC-72; Paper, for Wire Identification.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-454; 1928. Terminal; Type TM-98, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-480B; 1936. Terminal; Cable, Telephone, Unprotected.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-685; 1933. Cable Terminal; Types TM-171 and TM-173.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-696A; 1940. Panel, Type BD-75, and Terminal Strip TM-192, Wire Communication Cross-Connecting.

References.—Lugs, *see* 715.34; battery tray terminal lugs, *see* 721.2; storage battery terminals, *see* 712.9; *see* also references under 715.34.

715.36 Cable Reels and Wire Spools

American Transit Assn. Recommended Design of Trolley Wire Reels, Reel Bushings and Reel Braking Device. D109-31; 1931. Covers designs for four sizes of standard wooden reels for trolley wire. Includes several drawings of trolley wire reels.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 292. Reel; Emergency, Wire Take-up.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R63-28; 1928. Metal Spools. Establishes capacities of metal spools for annealing, handling, and shipping wire.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-45; 1926. Reel, Wire; Electric Lighting Equipment, Portable.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-2; 1926. Horse, Wire Reel; Electric-Lighting Set, Portable, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-6; 1938. Reel; Wire, Firing.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-3202; 1940. Axle; Cable-Reel, Submarine Mine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-5327a; 1939. Sling; Cable Reel, M1915.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-88B; 1943. Reel RL-17-A; Payout, on Barrow.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-144D; 1932. Reel; Type DR-4, for Holding Field Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-244D; 1943. Cable Reels.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-380; 1925. Reel; Type RL-3, Flat, Rectangular, Hand.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-456C; 1936. Reel for Cable; Submarine Mine, 1-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-532A; 1933. Reel; Type RL-20, Airplane Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-575D; 1943. Reel; DR-4, DR-5, DR-7, and DR-15.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-665B; 1942. Axle; RL-27-A and RL-27-B, for Laying Field Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-666F; 1944. Reel Unit RL-26-D; Engine-Driven, for Laying and Recovering Field Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-862; 1938. Reel; Type RL-30-B, Aircraft Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-907; 1936. Cart, Reel; Type RL-33, Balloon Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-911A; 1943. Reel Unit RL-31-B; Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1010; 1941. Reel; Type RL-39.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1121A; 1943. Reel Control Boxes BC421, BC-461, and BC-461-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1141; 1942. Reel RL-41-A and RL-42-A; Remote Controlled, for Trailing Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1712; 1943. Reel RL-42-B; Remote Controlled, for Trailing Antennas.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-2-G; 1943. Reel Cart RL-16-A.

715.39 Miscellaneous Wiring Supplies

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 159-39, 1939. Brass and High Tensile Strength Metals and Alloys for Binding Posts, Machine Screws, Nuts, Washers, Etc., Used in Signal Apparatus. Corrosion-resistant metal with properties as may be applicable, stock, composition, physical properties, and tests for tensile strength, elongation, and yield point by A. S. T. M. procedure.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 183-39; 1939. Multiple Unit Terminal Block. Drawing and design of unit, composition base, binding posts, dielectric requirements, and alternate requisites.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-82; 1942. Cast Metal Terminal Boxes. For use in terminating small cables on poles or building walls. Gives general requirements, material and workmanship, inspection and tests, packing, marking, and warranty.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H36; 1940. Safety Rules for Electric Fences. Comprising part 6 of the fifth edition of the National Electric Safety Code. Gives rules which apply to the installation, use, and identification of electric fences and to the construction and characteristics of the controllers used with them and through which electric energy is delivered to the fence.

U. S. Gov., U. S. Army, Signal Corps. Specification 29-43; 1924. Clamp; Guy Wire for Telephone Line Construction.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-33A; 1935. Block; Connecting, for Communication Circuits.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-93B; 1929. Ring, Types PF-73 to PF-76, Inclusive, for Supporting Aerial Cable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-237A; 1935. Block; Terminal, Type TM-70, for Communication Circuits.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-333A; 1932. Terminal Boxes; Types JB-7, JB-8, and JB-9.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-732; 1936. Carrier; Type RL-34, Wire.

715.4 WIRES, CORDS, AND CABLES

715.40 General Items

American Transit Assn. Copper Wire Tables, D1-32; 1932. Gives two complete wire tables for standard annealed copper in English and metric units, and one working copper wire table in English units.

American Transit Assn. Definitions and General Standards for Wires and Cables, D5-38; 1938. These standards include definitions and standards of a general character which are applicable to wires and cables for power purposes.

American Transit Assn. Recommended Copper Cable Tables, D111-41; 1941. The details in the tables are based on American Standards Assn. Specification H4.1 for annealed copper wire, which uses 891.58 lb. per mile-ohm and hard drawn copper wire, which uses a resistivity of 910.15 lb. per mile-ohm. Includes five tables covering bare concentric soft copper cables, bare concentric hard drawn copper cables of the A.S.T.M. class A, B, and C stranding, and one on bare concentric hard drawn copper cables with extra flexible stranding.

American Transit Assn. Recommended Guide for Preparation of Specifications for Insulated Wire and Cable, D120-41; 1941. This guide covers general standards for single, multi-conductor belted and multi-conductor nonbelted wires and cables insulated with rubber, varnished cambric or paper insulation and having any of the usual types of sheath or outer covering. It outlines the information that should be given in purchase orders or inquiries for wire and cable. Covers conductors, insulation, conductor identification, conductor assembly, fillers, binder, shielding, protective covering, saturant and finish, armor, and outer protective covering.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (6-e-41) Design of Motor Feeders and Circuits. Includes recommendations for the steps to take in designing motor supply circuits and feeders and selecting and laying out power distribution panels, motor disconnecting switches, feeder and circuit protective devices, and conduits to accommodate feeder and circuit conductors.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1942. Wire and Cable. General instructions covering kinking, twisting, bruising, grease, shipping, storing, pulling, conduit, wire joints, cable splicing, terminal eyes, marking, and line wire.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-40; 1930. Method of Testing Tin Coating on Copper Wire. Sodium-polysulfide test for determining the continuity of coating on copper wire, preparation of sample, reagents, coating and mechanical adhesion procedures.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-83; 1942. Gas Pressure Testing of Cables. Describes methods, apparatus and materials for the gas pressure testing of lead sheath paper-insulated cables and methods for maintaining these cables under constant gas pressure. Gives gas cylinders, regulators and pressure testing instruments, gas pressure testing of individual reel lengths of cable, flash testing of completed sleeves, gas pressure testing of loading coil cases, pressure dams, pressure testing valves and clamps, charging cables with gas, and gas pressure testing of complete cable.

Copper Wire Engineering Assn. Ice and Wind Loads on Copper Wire (Bare Solid), No. 401; 1938. Gives vertical, horizontal, and resultant loads in pounds per lineal foot of wire for light, medium, and heavy loading in accordance with loading districts of the National Electrical Code. Covers 1 to 8 Awg wire sizes.

National Electrical Manufacturers Assn. Maximum Permissible Current-Carrying Capacity of Rubber-Insulated Building Wire, 1938. Report covers maximum operating temperatures of code rubber factors affecting current-carrying capacity, thermal surface resistivity of cable coverings and conduits, additional considerations, formulae for current-carrying capacity calculation, ambient temperature, table showing summary of cable ratings, and tables showing current-carrying capacity for code grade, performance grade, and heat-resistant grade.

National Electrical Manufacturers Assn. Type Letter Designations of Wire and Cable, 41-70; 1941. Includes a list and brief descriptions of the present designations being used in the industry.

Underwriters' Laboratories, Inc. Standard for Rubber-Covered Wires and Cables, 1940. Covers rubber-insulated wires and cables for use in accordance with the National Electrical Code. Conductors, insulation, coverings, lay of twist, dielectric strength, insulation resistance, mechanical equivalence to type R, marking, and inspection of listed product. Emergency alternate—braids for types R and RW conductors acceptable for the RP and RH conductors.

Underwriters' Laboratories, Inc. Standard for Varnished-Cloth Wires and Cables, 1939. Covers varnished cloth-insulated wires and cables for use in accordance with the National Electrical Code. Conductors, insulation, coverings, cabling, dielectric strength, insulation resistance, dielectric strength after flexing, marking, and inspection of listed products.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-135; 1944. Cable Assemblies; Proof Testing and Prestretching of.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-43. Splicing; Cable Terminal, Process for.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C31; 1914. Copper Wire Tables. Tables based on international standard values for resistivity, temperature coefficient, and density of copper as defined by International Electrotechnical Commission. Tables give diameter, cross-sectional area, and resistance at various temperatures of copper and of aluminum wire and cable. American Wire Gage (B. & S.) with comparison tables for other gages.

715.41 Cables, Electrical

American Institute of Electrical Engineers. Recommended for Electrical Installations on Shipboard No.45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Wires and Cables. Covers copper conductors, insulation, rubber filled tape, braid, color code, cabling, fillers, rubber sheath, lead sheath, bituminous compound, armor, paint, dimensional tolerances, tests, constructions, applications, and installation.

American Society for Testing Materials, A 122-41; 1941. American Standards Assn., G 8.6-1943. Zinc-Coated Steel Wire Strand "Galvanized" and Class A ("Extra Galvanized"). For use as guy wire, messenger wire, electrical conductor, etc. Gives requirements as to zinc coating, stranding, ductility of steel and adherence of coating, table of physical properties of strand, sizes and permissible variations, and inspection.

American Society for Testing Materials, A 218-41; 1941. American Standards Assn., G8.11; 1944. Zinc-Coated Steel Wire Strand, Class B and Class C Coatings. For use as guy wires, messenger wires, span wires, electrical conductors, overhead ground wires, etc. Gives requirements for zinc, base metal, joints, stranding, weight and uniformity of coating, physical properties, elongation, ductility, adherence of coating, size and permissible variations, workmanship and finish, packing and marking, and inspection.

American Society for Testing Materials, B 8-44; 1944. Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft. Covers concentric-lay-stranded conductors, made from round copper wires, either uncoated or coated with tin, lead, or lead alloy for general use for electrical purposes. Gives requirements for wire, joints, lay, construction, physical and electrical tests, density, weight and resistance, variation in area, packing and shipping, marking, and inspection.

American Society for Testing Materials, B 172-42 T; 1942. Tentative Specifications for Rope-Lay-Stranded Copper Conductors Having Bunch-Stranded Members for Electrical Conductors. Covers members made from round copper wires, either uncoated or coated with tin, lead, or lead-alloy coatings, for use as electrical conductors. Classification, requirements for wires, joints, construction, physical and electrical tests, density, weight and resistance, variation in area, marking, and inspection.

American Society for Testing Materials, B 173-42 T; 1942. Tentative Specifications for Rope-Lay-Stranded Copper Conductors Having Concentric-Stranded Members for Electrical Conductors. Covers members made from round copper wires, either uncoated or coated with tin, lead, or lead-alloy coatings, for use as electrical conductors. Classification, requirements for wires, joints, lay, construction, physical and electrical tests, density, weight and resistance, variation in area, marking, and inspection.

American Society for Testing Materials, B 174-42 T; 1942. Tentative Specifications for Bunch-Stranded Copper Conductors for Electrical Conductors. Covers conductors made from round copper wires, either uncoated or coated with tin, lead, or lead-alloy coatings, for use as electrical conductors. Classification, requirements for wires, joints, lay, construction, physical and electrical tests, weight and resistance, variation in area, marking, and inspection.

American Society for Testing Materials, D27-41; 1941. Insulated Wire and Cable; Class AO, 30 Percent Hevea Rubber Compound. Requirements for conductor material, strand, stranding, tensile properties, conductivity and tinning tests; insulation composition, physical and electrical tests; shielding; cable tape; braid; finish, saturant, flame, moisture, and bending tests; lead sheaths; inspection and rejection; annealed copper standard; and interpretation of insulation thicknesses table. A.S.T.M. Emergency Alternate Provision EA-D27a; 1944, affected section 2, Conductor Material; section 7, Tinning Test; section 25, Cable Tape Material; section 28, Types of Cotton Braid; section 29, Standard Braid; section 30, Cotton Braid Material; section 31, Cotton Braid Construction; table IX, Values of Y for Code Braids; and table X, Typical Braid Construction.

American Society for Testing Materials, D 353-41; 1941. Insulated Wire and Cable: Performance Rubber Compound. Except for insulation conforms to A.S.T.M. Designation D 27. Methods of test, physical properties, high voltage test, insulation resistance, moisture absorption, thickness, workmanship, and rejection. A.S.T.M. Emergency Alternate Provision EA-D 353; 1942, affected section 1, Scope; table I, Physical Test Requirements for Insulation; and table III, Insulation Resistance.

American Society for Testing Materials, D469-41; 1941. Insulated Wire and Cable: Heat-Resisting Rubber Compound. For use at temperatures not in excess of 75°C., except rubber insulation conforms to A.S.T.M. Designation D27. Methods of test, physical properties, high-voltage test, insulation resistance, moisture absorption, thickness, workmanship, rejection, and interpretation of insulation thickness table. A.S.T.M. Emergency Alternate Provision EA-D469a; 1943, affected section 1, Scope.

American Society for Testing Materials, D 470-41; 1941. Methods of Testing Rubber Insulated Wire and Cable. Describe procedures for the testing of rubber-insulated wire and cable. They are not to be considered completely applicable to all types of wire and cable, nor do they necessarily include every test applicable to a particular type. To determine the tests to be made on a particular wire or cable, reference should be made to the specifications for that type. Physical and electrical tests of insulation, and tests on finished wire and cable.

American Society for Testing Materials, D 734-43T; 1943. Tentative Specifications for Insulated Wire and Cable; Polyvinyl Insulating Compound. Covers wire and cable insulated with a thermoplastic synthetic insulating compound made from polyvinyl chloride or its copolymer with vinyl acetate. Gives material, strand, shape, stranding, permissible variations in diameter and area, coating test, sampling and methods of test, test specimens, physical properties, heat shock test, heat distortion test, flame-retardant properties, oil resistance test, cold bend test, high-voltage test, insulation resistance, thickness of insulation, workmanship, and rejection.

American Society for Testing Materials, D 754-43T; 1943. Tentative Specifications for Insulated Wire and Cable: Heat-Resisting Synthetic Rubber Compound. Intended to permit the use of the compound known as "Government Rubber," type GR-S, but are not restricted to this type. Gives physical properties, high-voltage test, insulation resistance, thickness, workmanship, rejection, and methods of testing.

American Society for Testing Materials, D 755-44T; 1944. Tentative Specifications for Insulated Wire and Cable: Performance Synthetic Rubber Compound. Intended to permit the use of the compound known as "Government Rubber," type GR-S, but are not restricted to this type. Gives physical properties, high-voltage test, insulation resistance, thickness, workmanship, rejection, and methods of testing.

American Society for Testing Materials, D 574-40T; 1940. Tentative Specifications for Insulated Wire and Cable: Ozone-Resistant Type Insulation. Except for insulation, conforms to A.S.T.M., D27. Physical properties, high-voltage test, insulation resistance, double-voltage test on short samples, cold-bend, long-time voltage test, capacity and power factor tests, ozone-resistance test, and thickness of insulation. A.S.T.M. Emergency Alternate Provision EA-D574b; 1944, affected section 1(b), Scope.

American Transit Assn. Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Class A Compound, D10-41; 1941. Apply to the rubber compound used for the insulation of electric wire and cable, and which is known as class A 30 percent Hevea rubber. Gives requirements as to conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

American Transit Assn. Specification for Impregnated Paper Insulated, Lead Covered Cable, D13-41; 1941. This specification is intended to apply to all sizes and classes of impregnated paper-insulated, lead-covered cable which is to be used for the transmission and distribution of electrical energy in underground conduit systems. Gives general requirements, tests to be made on each length of cable, tests to be made on samples, tests to be made after installation, reels and shipment, and miscellaneous.

American Transit Assn. Recommended Specification for Varnished Cambric Insulated Cables, D113-41; 1941. This specification applies to all sizes and classes of varnished cambric lead covered or braided cables which are to be used for the transmission and distribution of electrical energy, and may apply to either underground, aerial, or station cable, under normal conditions of installation. Gives general requirements, tests to be made on each length of cable, tests to be made on samples, and general provisions.

American Transit Assn. Recommended Specification for Weather-Resistant Weather-Proof Wire and Cable U.R.C. Type, D114-41; 1941. These specifications cover weather-resistant, weatherproof wire and cable, the conductors, the materials used for the fibrous coverings, and the saturating and finishing compounds. Covers materials and properties, acceptance requirements, general requirements, and appendix.

American Transit Assn. Recommended Specification for Heat-Resisting Wires and Cables, D115-32; 1932. This specification covers the usual type of heat-resisting covering commonly known as "slow-burning," as applied to metallic conductors for use in hot, dry locations where the standard insulating materials would not long endure or where the presence of large masses of inflammable materials would be objectionable. It includes materials and properties, and measurements and tests.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for General Purposes—Code Rubber Insulation, D116-41; 1941. This specification applies to the rubber compound used for insulation of electric wire and cable and which is known as code rubber insulation. Covers general requirements, conductor, insulation, cable tape, braid, finish, lead sheaths, and armor.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Class AO Compound, D117-41; 1941. These specifications apply to the rubber compound used for the insulation of electric wire and cable and which is known as Class AO 30 percent Hevea rubber. Covers general requirements, conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Performance Rubber Compound, D118-41; 1941. This specification is intended to cover the furnishing and testing of various kinds of rubber insulated conductors for power distribution purposes, the insulation to be of the grade known as Performance Rubber Compound. Covers general requirements, conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 4-e-42; 1942. Specifications for Rubber Insulated Wires and Cables No. 18 A.W.G. and Larger. Gives general requirements. standards for rubber covered wire and cable conductors, separator, rubber compounds, cable tape, cable assembly, cotton braids, metallic coverings, shipment on cable reels, shipment on coils, and details.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 54-39; 1939. Aerial Aluminum Cable Steel Reinforced. Detailed requirements for signal service, new and renewal installations. Aluminum wound, steel core conductor, mechanical properties, and footage for various gages in reels and coils.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, Specification 89-40; 1941. Multiple-Conductor, Rubber-Insulated Cable with Weather-Resistant, or Flame-Retarding Moisture-Resistant Braid Covering. Covers material and workmanship, conductor insulation, assembly, braid covering and cable tape, identification, inspection, tests, acceptance requirements, packing, marking, and warranty. Emergency modification E89-40 was issued which changed requirements to comply with List 27 of W.P.B. Rubber Order R-1.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 90-40, 1941. Multiple-Conductor, Rubber-Insulated, Submarine Cable, Lead Sheathed and Round Steel Armored. Purpose, tender, alternates, material and workmanship, conductor insulation, assembly, rubber-filled cable tape, lead sheath, armoring and covering, identification, inspection, tests, samples for test, acceptance requirements, packing, marking, and alternate requisites. Emergency Modification E90-40 was issued which changed requirements to comply with List 27 of W.P.B. Rubber Order R-1.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 91-40; 1941. Single and Multiple-Conductor, Rubber-Insulated Lead Sheathed Cable. Purpose, tender, alternates, material and workmanship, conductor, insulation assembly, rubber-filled cable tape, lead sheath identification, inspection, marking, warranty, and alternate requisites. Emergency Modification E91-40 was issued which changed requirements to comply with List 27 of W.P.B. Rubber Order R-1.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 111-40; 1942. Signal-Conductor, Rubber-Insulated Wire and Cable With Flame-Retarding, Moisture-Resistant or Weather-Resistant Braid Covering. For use on signal circuits rated at 0-600 and 601-2,500 volts. Covers material and workmanship, conductor, insulation, braid covering and cable tape, identification, inspection, tests, packing, marking, and warranty. Emergency modification E111-40 was issued which changed requirements to comply with List 27 of W.P.B. Rubber Order R-1.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 145-40; 1941. Single and Multiple-Conductor, Rubber-Insulated, Lead-Covered Parkway Cable Armored With Flat Steel or Zinc Tape. For use on circuits with 0-600 and 601-2,500 volts; requirements for tinned copper conductor meeting A.S.T.M. Specifications B 33 and D 27, for 30 percent Hevea rubber insulation, assembly, cable tape, lead sheath, jute bedding in accordance with American Standard C8.15, flat metallic tape of ungalvanized steel, asphalt or hot tar outer covering served with jute yarn and for marking and inspection. Emergency Modification E145-40 was issued which changed requirements to comply with List 27 of W.P.B. Rubber Order R-1.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 161-40; 1941. Single and Multiple-Conductor, Rubber-Insulated, Non-Metallic Sheath Cable. For use in direct contact with earth, in ducts, in air or any of these combinations and on circuits rated at 0-600 and 601-2,500 volts. Requirements for tinned copper conductors meeting A.S.T.M. Specifications B 33 and D 27, for 30 percent Hevea rubber insulation, assembly, moisture seal rubber sheath, tape, outer covering, and saturant. Emergency Modification E 161-40 was issued which changed requirements to comply with List 27 of W.P.B. Rubber Order R-1.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1942. Wire and Cable. General instructions covering kinking, twisting, bruising, grease, shipping, storing, pulling, conduit, wire joints, cable splicing, terminal eyes, marking, and line wire.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-9; 1938. Paper Insulated, Lead Covered Communication Cable. Includes two grades based on dielectric strength of insulation, otherwise identical, dimensions and tensile strength of copper conductors, quality and thickness of paper insulation and lead sheath, construction of cable, color codes for quadded and nonquadded pairs, ohmic resistance, dielectric strength, capacitance unbalance, sealing, reels, and marking.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-12; 1931. Specification for Splicing Lead Sheathed Paper Insulated Cables. Describes and illustrates standard methods of splicing cable, bonding, and other practices allied with splicing operations.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-48; 1932. Paper Insulated, Submarine Telephone Cable. Requirements for lead covered, armored cable with twisted pairs, in two types, identical except for thickness of insulation; includes Nos. 10 to 22 gage wire, paper wrapping, twists of pairs and quads, color codes, tracers, core insulation, lead sheath, jute roving, galvanized armor wire, conductor resistance, capacitance, dielectric strength, and insulation resistance.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-49; 1932. No. 19 A.W.G. Pothead Cable. Covers 11 standard sizes of cable, 7 to 152 pairs, rubber-insulated, nonquadded, for use in tipping paper-insulated cables. Requirements for solid wire annealed copper conductors, quality of Hevea rubber insulation, twists of pairs, tracer, sheath, dielectric strength, and insulation resistance.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-50; 1932. Rubber-Insulated, Braid-Covered Cable With No. 14 A.W.G. Quadded Conductors. Includes 15, 20, and 34 conductor cables; requirements for tinned copper wire, Hevea rubber insulation, tracer, quadding, cabling, color dating, braiding, weatherproofing, finishing wax, and tests.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-66; 1936. Rubber-Insulated, Quadded, Lead-Covered Cable. Covers 7 sizes from 4 to 76 conductors using Nos. 14 and 16 A.W.G. solid copper wire. Requirements for Hevea rubber insulation, tracer, quadding, cabling, sheath, conductor and insulation resistance and dielectric strength.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-67; 1937. Specification for Installing Buried, Tape-Armored, Lead-Covered Cable. Includes quality of materials, trenching, back filling, neutralizing wire, location of splicing chambers, laying cable, splicing, bonding, soldering, and terminating.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-72; 1938. Specification for Installing Aerial, Tape-Armored, Lead-Covered Cable. Gives method of installing, splicing, and terminating cable AAR-1-A-73; describes and illustrates temporary and permanent bonding and stripping, and completed bond.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-73; 1938. Tape-Armoring Lead-Covered Cable. Gives requirements for tape-armoring paper-insulated cable AAR-1-A-9, or rubber insulated cable AAR-1-A-66, for aerial use, and for underground use. Includes jute roving, coal tar pitch, asphalt, galvanized tape armor, tensile strength of jute and steel tape, sizes, and tests.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-75; 1939. Rubber-Insulated, Jute-Covered, Tape-Armored Cable. Includes four sizes of cable, consisting of quads with single conductor forming a core, taped, armored and jute-covered for direct burial in the ground. Requirements for copper wire and steel tape conforming to A.S.T.M. specifications, Hevea rubber insulation, jute covering, and galvanizing by AAR-1-D-5 method, asphalt impregnating compounds, electrical tests, and reeling.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-76; 1939. Testing, Repair and Splicing of Rubber-Insulated, Braid-Covered Emergency Cable. Description and diagrams for locating faults with violet-ray apparatus, detection tests for open, shorts and crosses, open conductors by bridge method, and attachment of identification tag, and procedure for making and insulating conductor joints.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-90; 1942. No.16 A.W.G. Rubber Insulated, Lead Sheathed, Steel Armored Cable; Parkway. For direct burial in the ground, and used primarily for laterals from open wire lines. Gives general requirements, conductors, rubber insulating compound, cable lay-up, sheath, jute and steel tape armor—materials, application of jute and steel tape armor, finish, electrical requirements, packing, marking, and warranty. Emergency Alternate 1-A-90EA-2; 1944, changed 1-A-90, in order to conserve critical and scarce materials during the war period.

Assn. of American Railroads, Telegraph and Telephone Section, 1-C-10; 1927. Underground Cable Installation. Specification for installation and removal of underground cables including precautionary measures, ventilation of manholes, rodding and threading ducts, arrangement of tackle, setting up reel and pulling cable, lubricating cable, bonding, sealing, removal methods, with illustrations of typical procedure.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-2; 1924. Braided Office Cable. Cable of nonquadded twisted pairs of rubber insulated No. 16 A.W.G. tinned copper wire; requirements for number of pairs, Hevea rubber insulation, woven cotton braid, weatherproof compound, paraffin saturated jute filler, tapes and cotton braid sheath, identification marking, construction of cable, physical and electrical tests.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-19; 1938. Lead Sheath Office Cable Non-Quadded or Quadded. For cable with cotton or silk and cotton-covered tinned enameled Nos.19 or 22 A.W.G. conductors, made up either paired or quadded; requirements for solid copper wire, tinning, enamel, twisting of pairs and quadding, colors of braid and number of plies, lead sheath, sealing, table of color identification, sizes of cables, electrical properties, and reeling.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-22; 1927. Braided Office Cable of Quadded Rubber Insulated No.16 A.W.G. Conductors. Includes 12 and 20 conductor cables with requirements for solid copper wire conductors, tinning, rubber insulation in accordance with A.S.T.M. specifications, colors of braid, weatherproofing, saturated jute filler, tapes, and woven cotton sheath, manufacture, tinning test, tensile strength of rubber, and electrical tests.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-78; 1938. Braid or Lead Sheath Impregnated Office Cable. Cable of cotton or silk and cotton tinned enameled Nos.19 or 22 A.W.G. solid copper wire, made up in either paired or quadded conductors and with braid or lead sheath. Requirements for sizes of 5 to 200 paired and 7 to 108 quadded cables, impregnating compound, sheath, color schemes, dielectric strength, resistance, and capacitance unbalance tests.

Assn. of Edison Illuminating Companies. Impregnated Paper Insulated, Lead-Covered Cable; Oil-Filled Type, 1938. Addenda, 1939. These specifications cover single-conductor cable rated between 15 and 230 kv., and 3-conductor, shielded cable rated between 15 and 69 kv., of the oil-filled type; requirements for impregnation, size of wires in conductors, impregnating oil (tested by A.S.T.M. Method D 97). thickness of insulation, sheath, power factor, operating temperature, voltage test, ionization factor, bending test, and test apparatus.

Assn. of Edison Illuminating Companies. Impregnated Paper-Insulated, Lead-Covered Cable; Solid-Type, 1937. Addenda, 1939. These specifications cover cable for distribution of energy in underground conduit systems, except pressure measurement, fire alarm, signaling, and telephone service. Requirements for manufacture as to conductors, copper wire meeting A.S.T.M. Specification B 3, A.S.A. C8-3, conductor-resistance table, paper insulation quality and thickness, for single-conductor, shielded and nonshielded cables, multiple-conductor cable, and shielding and binder tape, impregnation, lead sheath, overall diameter, insulation resistance, power factor, and tests.

Copper Wire Engineering Assn. Design Sags and Tensions (Final), Initial Sags and Tensions. Charts No.250; 1938, No.6 A3; 1940, and 12 W3; 1938. For use in preliminary design and calculation of ruling span curves for stringing conductor in dead-end spans (prestretched and unstretched), heavy, medium, and light load districts. Gives tension limits, at maximum, initial, and final load, sag in feet for various spans, and tensions.

Copper Wire Engineering Assn. Properties of Copper Cable—Bare, Hard-Drawn, No. 401; 1938. For stranded cable sizes in accordance with A.S.T.M. Specification B8, 500,000 to 4 A.W.G., number and diameters of wires, resistance, cross-sectional area, weight and breaking strength. Also gives ice and wind loads (vertical, horizontal, and resultant, in pounds per lineal foot).

Electrical Standards Committee, sponsor. American Standards Assn., C 8.9-1942. Slow-Burning Wire and Cable. Covers scope, conductors, fibrous covering, filling and finish of coverings, acceptance tests, samples for test, identification, packing, and marking, inspection, rejection, and weight of copper conductors and complete coverings.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C8.1-1932. American Institute of Electrical Engineers' Standard No. 30. Definitions and General Standards for Wires and Cables.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C8k1-1932 and C8k2-1932. American Institute of Electrical Engineers' Standards Nos. 72 and 73. Published as one pamphlet. Weatherproof (Weather-Resisting) Wires and Cables (C8k1-1932); and Heat-Resisting Wires and Cables (C8k2-1932). C8k2 Specifications cover "slow-burning" materials as applied to conductors for use in hot, dry locations where standard insulating materials would not endure or where the presence of large masses of inflammable materials would be objectionable. Gives number of cotton or other approved fibrous braids, thickness, adhesion, and fireproofing requirements, measurements, and tests. C8k1 Specifications cover materials used for braids and saturating compounds, as applied to metallic conductors. Includes cotton braid, and for No. 0 wire and larger inner braids of jute yarn, degree of saturation, thickness sizes and weights, and drip, bending, and melting tests.

Electrical Standards Committee of the American Standards Assn., sponsor. American Standards Assn., C8.12-1942. Cotton Braid for Insulated Wire and Cable for General Purposes. Specification covers braids as applied to rubber and varnished cloth insulated wires and cables. They do not cover "fancy" or special braids or braids for fixture wire or weather-resisting wire and cable. Three classes: heavy, for outdoor or rough service; standard, for indoor or protected service; and code, for installation under the National Electrical Code. Gives detail requirements for materials, construction, and measurement.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C8.13-1942. American Standard for Varnished Cloth Insulation for Lead Covered or Braid Covered Power Cable. Apply to varnished cloth insulation in metallic covered and/or braided cable, which is to be used for the transmission and distribution of electrical energy in underground, aerial, or indoor cable systems within following voltage limits: for nonshielded, multiple conductor cable, not over 17,000 volts between conductors; for single conductor and shielded cable operating on an ungrounded neutral system not over 17,000 volts between conductors; for single conductor and shielded cable operating on a grounded neutral system not over 28,000 volts between conductors. The requirements prescribed are identical with those for insulation in the Insulated Power Cable Engineers Assn. Specifications for Varnished Cambric Insulated Cables, 4th edition, July 1939 (also a standard of the National Electrical Manufacturers Assn.).

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C8.14-1938. Specifications for Bare Concentric-Stranded Copper Cable for Insulated Conductors: Hard, Medium-Hard, or Soft. Requirements on concentric-stranded cable made from round copper wire for general use in the manufacture of covered or insulated electrical conductors.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C 8.15-1942. Specifications for Metallic Coverings for Insulated Wires and Cables. Apply to metallic coverings, together with the necessary beddings and protective coverings, for power and lighting circuits. Gives requirements for lead sheath, core covering for nonleaded cable, jute bedding for armored cable, flat steel tape armor, galvanized steel wire armor, interlocked steel tape armor, jute serving over lead sheath, duck tape over lead sheath, and braid over lead sheath.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C8.18-1942. Weather-Resistant (Weatherproof) Wire and Cable; U.R.C. Type. Covers wire and cable, the conductors, the materials used for the fibrous coverings, and saturating and finishing compounds. Gives requirements for conductors, fibrous covering, saturant, finish, mineral filler, acceptance requirements, samples for test, identification, packing and marking, inspection, and rejection.

Insulated Power Cable Engineers Assn. Metallic Coverings for Insulated Electric Cables, 1940. For lead sheath, flat steel tape armor, interlocked steel tape armor (except service entrance), and round galvanized steel wire armor; lead sheath quality, alloy sheath, and thickness; jute serving over lead sheath and duck tape over lead sheath without metallic armor; flat steel tape quality, galvanizing, width and thickness, lay and spacing; interlocked metal tape quality, width and thickness; galvanized steel wire quality, tensile strength, galvanizing, flexibility, and size; jute serving, bedding, core covering, rubber filled tape, and cotton braid; bored hole cable, dredge, shaft, and vertical riser cable, round wire armor construction. Adopted by the National Electrical Manufacturers Assn.

Insulated Power Cable Engineers Assn. Ozone Resistant Type Insulation for Electric Cables. Covers ozone resistant type insulation for all sizes and classes of single and multiple conductor power cables which are to be used for the transmission and distribution of electrical energy, either underground, submarine, aerial, or indoor. Gives information to be supplied by purchaser, conductors, insulation, tape over insulation, shielding, electrical tests, ozone resistance test, and physical and accelerated aging tests. Adopted by the National Electrical Manufacturers Assn.

Insulated Power Cable Engineers Assn. Rubber Insulated Parkway Cables, 1936. Primarily for direct earth installation, includes lead covered metallic armored, lead and jute covered, lead and duck tape covered, and nonmetallic armored cables; general description, conductors, stranding, rubber insulation thickness, shielding, rubber tape, braid, voltage tests, insulation resistance, assembly of multi-conductor cable, identification, lead sheath, jute, steel tape, and duck requirements; methods of test and tables of properties. Adopted by the National Electrical Manufacturers Assn.

Insulated Power Cable Engineer's Assn. Rubber Insulated Power Cables, 1935. For cables insulated with code, intermediate, 30 percent, and higher grade rubber compounds; conductors to meet A. S. A. Specification C8b1, insulation thickness practically A. I. E. E. standards, for single, two, and three phase systems, and direct current systems, additional thickness for nonleaded submarine cable, grades of insulation recommended, recommended shielding, test voltages, insulation resistance, and temperature correction, braid standards, rubberized tape, and thickness of lead; tables of properties and bending radii. Adopted by the National Electrical Manufacturers Assn.

Insulated Power Cable Engineers Assn. Varnished Cambric Insulated Cables, 1939. These specifications cover all sizes and classes of varnished cambric insulated lead covered or braided cables underground, aerial, or indoors, except special uses such as vertical risers in buildings exceeding 100 ft. General description, conductors to meet A. S. A. Specification C8b2 and C8a-section 30-152, resistance requirements, tensile strength, varnished cloth to meet A. S. T. M. D295, thickness of insulation, shielding, thickness of braid and braid color code, rubber and cotton braid covers, paint filled, mica-coated pitch, methods of test, lead sheath, thickness and tolerance, for multiple conductor round and flat twin cables, belted and non-belted (with individually shielded conductors); for service up to 17,000 volts for nonshielded multiple conductor cables, and shielded cables operating on grounded neutral at not over 28,000 volts between phases. Adopted by the National Electrical Manufacturers Assn.

International Municipal Signal Assn., Inc. Specification No. 1; 1942. Multi-Conductor Rubber Insulated, Alloy Sheathed, Fire Alarm and Signal Cable. Covers multi-conductor, rubber insulated, alloy sheathed cables for use in fire alarm, police signal and other municipal signal systems operating at 600 volts or less, and approved for installation in underground conduits or for use as aerial cable. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, alloy sheath, electrical tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification No. 2; 1942. Rubber Insulated, Lead Sheathed and Armored (Parkway) Signal Cable. Covers armored multi-conductor, rubber insulated cables for use in fire alarm, police signal and other municipal signal systems operating at 600 volts or less and approved for direct earth burial. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, lead sheath, armor, electrical tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification No. 3; 1942. Rubber Insulated, Heavy Braid, Multi-Conductor Signal Cable; Type FB. Covers braid covered multi-conductor, rubber insulated cables for use in fire alarm, police signal and other municipal signal systems operating at 600 volts or less and approved for installation in buildings. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, braid covering, saturant, finish, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and test, and rejection.

International Municipal Signal Assn., Inc. Specification No. 4; 1942. Rubber Insulated, Loom Covered, Multi-Conductor Signal Cable. Covers loom covered multi-conductor, rubber insulated cables for use in fire alarm, police signal and other municipal signal systems operating at 600 volts or less and approved for installation in buildings or with aerial messenger. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, loom covering, saturant, finish, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and test, and rejection.

International Municipal Signal Assn., Inc. Specification No. 5; 1942. Rubber Insulated, Rubber Jacketed, With Jute Braid Overall, Multi-Conductor Fire Alarm Signal Cable. Covers rubber jacketed, multi-conductor, rubber insulated cables for use in fire alarm, police signal, and other municipal signal systems operating at 600 volts or less and approved for use in underground ducts or as an aerial cable supported on messenger. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, protective coverings, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and test, and rejection.

International Municipal Signal Assn., Inc. Specification No. 7; 1942. Multiple Conductor Traffic Control Cable. Covers rubber insulated multiple conductor cables in sizes Nos. 14, 12, and 10 A. W. G. for use in traffic control circuits operating from 0 to 600 volts. This cable may be used for general application and is furnished with two types of outer cover. Gives requirements for general construction, conductors, insulation, braids on conductors, conductor assembly, fillers, cable tape, overall coverings, electrical tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification No.8; 1942. Multi-Conductor Rubber Insulated, Rubber Jacketed Series Street Lighting Cable. Covers rubber insulated, rubber jacketed multi-conductor cables in sizes 10 to 4 A.W.G. inclusive for use on street lighting circuits at a maximum of 600 volts between conductors and from 600 to 5,000 volts between conductors and ground. The cable may be used for either interior or exterior installations. Gives requirements for general constructions, conductors, insulation, braid on conductors, conductor assembly, rubber jacket, overall coverings, electrical tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification No. 16; 1942. 90 Per Cent Unmilled Rubber Insulated (Type FLT-TU) Alloy Sheathed Fire Alarm Signal Cable. Covers multi-conductor cables insulated with 90 percent unmilled rubber for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c., and approved for installation in underground conduits or for use as aerial cables. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, protective covering, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 16-A; 1942. 90 Per Cent Unmilled Rubber Insulated (Type Fal-Tu) Lead Sheathed and Armored (Parkway) Signal Cable. Covers multi-conductor cables insulated with 90 percent unmilled grainless rubber for use in fire alarm, police signal, and other municipal signal systems for operating voltages not exceeding 125 volts a.c. or 250 volts d.c. and approved for direct earth burial. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, lead sheath, armor, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 16-B; 1942. 90 Per Cent Unmilled Rubber Insulated (Type FB-TU) Braided Fire Alarm Signal Cable. Covers multi-conductor cables insulated with 90 percent unmilled rubber for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c., and approved for installation inside buildings. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, braid covering, saturant, finish, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 16-C; 1942. 90 Per Cent Unmilled Rubber Insulated (Type Fn-Tu) Loom Covered Fire Alarm Signal Cable. Covers multi-conductor cables insulated with 90 percent unmilled rubber for use in fire alarm, police signal, and other municipal signal systems, for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c. and approved for use as aerial cables. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, loom covering, saturant, finish, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 16-D; 1942. 90 Per Cent Unmilled Rubber Insulated (Type Fr-Tu) Rubber Jacketed, Jute Braided Fire Alarm Signal Cable. Covers multi-conductor cables insulated with 90 percent unmilled rubber for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c. and approved for use in underground ducts and as aerial cable. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, rubber sheath, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 16-E; 1942. Emergency Cable, for Municipal Signal Systems, 90 Per Cent Rubber Insulation, Rubber Sheathed. Covers multi-conductor emergency cables for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c. Gives requirements for general construction, conductors, insulation, braids on conductors, pairs, conductor assembly, fillers, tape, rubber sheath, rubber sheath alternate, tests on completed cable, and identification.

International Municipal Signal Assn., Inc. Specification 17; 1942. 50 Per Cent Rubber Insulated (Type FLT-T) Alloy Sheathed Fire Alarm Signal Cable. Covers multi-conductor cables insulated with 50 percent rubber for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c., and approved for installation in underground conduits or for use as aerial cables. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, protective covering, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 17-A; 1942. 50 Per Cent Rubber Insulated (Type Fal-T) Lead Sheathed and Armored (Parkway) Signal Cable. Covers multi-conductor cable insulated with 50 percent rubber for use in fire alarm, police signal, and other municipal signal systems for operating voltages not exceeding 125 volts a.c. or 250 volts d.c. and approved for direct earth burial. Covers general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, lead sheath, armor, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 17-B; 1942. 50 Per Cent Insulated (Type Fb-T)

Braided Fire Alarm Signal Cable. Covers multi-conductor cables insulated with 50 percent rubber for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c. and approved for installation inside buildings. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, braid covering, saturant, finish, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests; and rejection.

International Municipal Signal Assn., Inc. Specification 17-C; 1942. 50 Per Cent Insulated (Type Fn-T) Loom Covered Fire Alarm Signal Cable. Covers multi-conductor cables insulated with 50 percent rubber for use in fire alarm, police signal, and other municipal signal systems for operation at voltage not exceeding 125 volts a.c. or 250 volts d.c. and approved for use as aerial cables. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, loom covering, saturant, finish, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 17-D; 1942. 50 Per Cent Insulated (Type Fr-T) Rubber Jacketed, Jute Braided Fire Alarm Signal Cable. Covers multi-conductor cables insulated with 50 percent rubber for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c. and approved for use in underground ducts and as aerial cable. Gives requirements for general construction, conductors, insulation, conductor coverings, conductor assembly, fillers, cable tape, rubber sheath, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification 17-E; 1942. Emergency Cable for Municipal Signal Systems, Rubber Sheathed. Covers multi-conductor emergency cables for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 250 volts d.c. Gives requirements for general construction, conductors, insulation, braids on conductors, pairs, conductor assembly, fillers, tape, rubber sheath, rubber sheath alternate, tests on completed cable, and identification.

International Municipal Signal Assn., Inc. Specification No. 18; 1942. Paper Insulated Lead Sheathed Telephone Cable. Covers paper insulated, lead sheathed cables, for telephone circuits and other applicable uses in municipal communication systems whose operating voltages do not exceed 125 volts a.c. or 250 volts d.c. This type of cable is not approved for fire alarm circuits. Gives requirements for general construction, conductors, insulation, colors of insulation, cable assembly, paper covering over core, sheath, density of cable, tests, capacitance, insulation resistance, dielectric strength, identification, defective pairs, armor, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification No. 32; 1942. 30 Per Cent or 40 Per Cent Conductivity Copper Covered Steel Messenger Strand. Covers copper covered steel strand of two types, high strength and extra high strength for use as messengers in supporting aerial cable, fire alarm, police patrol and traffic signals or other municipal signalling equipment, and for the guying of overhead line poles. Gives requirements for material, properties, samples for test, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Wire and Cable; Copper. Covers definition, constants (copper wire), general properties, types of wire, prices, packing, and purchase practices.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Conductors. Type and thickness of insulation, voltage limits, braid coverings, standard stranding for armored cable and nonmetallic sheathed cable, demand calculations for feeder sizes.

Society of Automotive Engineers. Aeronautical Material Specification 3385, 1941. Markers, Ignition Cable (Non-Metallic). Tubing closely braided from commercially white cotton or other suitable material, and coated on the inside and outside with a flexible insulating varnish or lacquer, to produce a smooth, uniform finish. Includes requirements for size, markings, tests, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specifications 3390 and 3392; 1942. Ignition Cable; High Tension (Copper Conductor). For stranded copper conductors covered with insulating compound and a protective coating. 3390 for .275-.287 in. in actual diameter and 3392 for .345-.360 in. in actual diameter. Covers requirements for shape, construction of cable, insulation, protective coatings, concentricity, age, test samples, tests, packing and marking, reports, approval, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3397; 1942. Ignition Cable; High Tension (Steel Conductor—Low Capacitance). For stranded corrosion-resisting steel conductor covered with insulating compound and a protective coating. .275-.287 in. in actual diameter. Covers requirements for construction of cable, insulation, protective coatings, concentricity, identification, age, test samples, tests, packing and marking, reports, approval, and rejections.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Material. S.A.E. Standard Insulated Cable, revised 1942. Low (general specifications, tests, lighting and starting motor cables and double braid lighting cables) and low tension cable (general specifications, tests, and lighting and starting motor cables).

Underwriters' Laboratories, Inc. Bulletin of Research 25; 1942. Performance of Rubber Insulation of Building Wire in One-Year Oven Tests. This bulletin describes one-year oven tests of rubber insulation of building-wire of several new types, conducted to determine if their performance under test at the maximum temperatures recognized by the National Electrical Code, would indicate proper performance under field conditions. Covers description of samples, methods of test, results of tests, analysis of test results, and summary.

Underwriters' Laboratories, Inc. Standard for Armored Cable, 1941. Armored cable and cord for use in accordance with National Electrical Code. Conductors, fillers, lead coverings, armor, elongation, tightness of armor on conductors, flexibility, dielectric strength, continuity of conductors, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Fire-Alarm Cables, 1941. Covers cables having two or more conductors, intended for fire-alarm signaling circuits and for application in accordance with Standards of the National Board of Fire Underwriters for Municipal Fire Alarm Systems. Covers conductors with heavy-wall, thin-wall (type TU), and thin-wall (type T) insulation. Conductors, insulation, conductor coverings and assemblies, cable coverings, electrical tests, markings, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Gas-Tube-Sign and Oil-Burner-Ignition Cable, 1943. Covers single-conductor gas-tube-sign and oil-burner-ignition cable for use with gas-tube systems for signs, outline lighting, and interior lighting in accordance with the National Electrical Code and Underwriters' Laboratories, Inc. Gives requirements for conductors, insulation, coverings, routine voltage application, extended voltage application, surface leakage, dripping of compound, flame-retardant properties, cable with overall copper-wire braid, lead-sheathed cable, rating, marking, inspection of listed products, labels, inspection reports, and field inspection.

Underwriters' Laboratories, Inc. Standard for Nonmetallic-Sheathed Cable, 1941. Covers nonmetallic-sheathed cable for use in interior wiring systems involving potentials for 600 volts or less, in accordance with the National Electrical Code. Conductors, protective sheath, assembly of conductors, fillers, impregnation, outer covering, flexibility, dripping of compound, tensile strength, elongation, dielectric strength, polarity identification, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Service Cables, 1937. For service-entrance, and service-drop cables, for circuits of 600 volts or less, and for 150 volts or less uninsulated. Types for mechanical resistant to abuse, flame retardance, moisture resistance, underground service, and service-drop. Minimum size wire, rubber-covered conductors, heating, corrosion protection, moisture absorption, compound, bending at low temperature, flame retardant properties, overload, impact, dielectric strength, polarity, and marking requirements.

U. S. Gov., Army Air Forces. Specification 32427 (1); 1943. Cable; Ignition, High Tension (Synthetic Sheathed).

U. S. Gov., Army Air Forces. Specification 32516; 1945. Cable Assembly; External Power Connection, for Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-130; 1944. Cable; High Tension Ignition.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-C-48a; 1943. Cable; Electric, Low-Tension, Aircraft.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-31. Cable; Concentric, for Radio Transmission Lines.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-84. Cable; Concentric, Rubber-Insulated R.F., for Radio Transmission Lines.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-161. Cable; Concentric, Rubber-Insulated R. F., for Radio Receiving Lines.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-378. Power Lines; Grounded Neutral (Overhead).

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-441. Cable; Electrical, Non-Metallic Armor, for Underground Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-466. Cable; Emergency, Artificial Line To Be Used With.

U. S. Gov., Dept of Commerce, National Bureau of Standards H32; 1941. American Standards Assn., C2.2-1941. Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines. Comprising part 2 of the fifth edition, National Electrical Safety Code. Includes requirements on grades of construction and materials for supply cables and conductors; conductor loadings; and strength requirements for open supply conductors, supply cables, and communication cables. Appendixes (A) recommended normal sags of overhead line conductors; (B) minimum permissible sags; (C) sags for line conductors strung to 2,000 lb. limit; and (D) mechanical data for copper, steel, copper-covered steel, and aluminum wires and cables.

U. S. Gov., Federal Specification J-C-31; 1942. Cable Units; Battery and Starter. Covers one grade in two types—(I) ground cable units, uninsulated (class A—rope strand, and class B—strap, flat); and (II) starter cable units, insulated (class A—flexible, and class B—standard). Gives requirements for conductors, tolerances, battery post terminals, lugs, terminals, connections, length, sizes, and insulation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification J-C-71a; 1944. Cable; Armored (Including Lead Covered Types and Armored Cord), 0 to 600-Volt Service. Gives types, sizes, material and workmanship, general design, copper conductors, insulation, fibrous insulation covering, fibrous sheathing, lead sheathing, steel armor, marking of armor, twisted assemblies, insulated conductor continuity, bushings, flexibility, dielectric strength, armor, electrical resistance, tightness of armor on conductor assembly, armor resistance to stretching, zinc coating of armor; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification J-C-86; 1943. Cable, Cord, and Wire; Electric, Flexible, Cotton-Covered (General Service). Covers four types. Gives detail requirements as to construction, methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification J-C-103; 1941. Amendment 2; 1944. Cable and Wire; Rubber-Insulated, Building Type (0 to 5,000-Volt Service). The term "rubber" as used throughout this specification includes synthetic rubber. Covers all listed sizes of rubber-insulated wire and cable in two types, R-code grade, and RH-heat-resistant grade. Gives requirements for conductors (resistance, sizes, strands, lead-coated or lead-alloy-coated, splices, and separator), insulation (thickness and physical properties of rubber compound), coverings (fibrous coverings, number of coverings, cotton tapes, cotton braids, cotton wraps or servings, saturation of fibrous coverings, flame-retardant properties, moisture-resistant properties, flexibility, finish, lay of twist, and lead coverings), dielectric strength, insulation resistance, and marking of wire and cable; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification J-C-121; 1935. Cable and Wire; Rubber-Insulated (for) Other Than Building Purposes, Superaging-Grade (0 to 8,000-Volt Service). Covers four types of single and multiple conductor wires, and cable-braided; lead-covered (with or without protective covering); armored (with or without lead covering) with interlocking metal, flat metal, round wire, or basket-weave metal; and with nonmetallic sheath. Gives general requirements for conductors (sizes, number of strands), insulation, coverings for wires and cables of the four types, and polarity and identification markers (color scheme for control cables); detail requirements for rubber insulation, tape, and braid; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification J-C-138; 1943. Cable and Wire; Varnished-Cloth Insulated (0 to 5,000-Volt Service). Covers varnished-cloth insulated wires and cables of all wire sizes listed in table and designates four types. Gives requirements for material, resistance, sizes, strands, tinning, splices, separator, insulation, coverings, cabling, dielectric strength, insulation resistance, sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., Joint Army-Navy Specification, JAN-C-17; 1944. Cables; Coaxial and Twin Conductor for Radio Frequency.

U. S. Gov., Navy Dept. Specification 15C11; 1937. Cables; Electric, Insulated (Shipboard Use).

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Rubber-Sheathed Flexible cords and Cables, 1937.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Cable; Two Conductor Rubber Sheathed.

U. S. Gov., Treasury Dept., Procurement Div., 321A; 1942. Cable; Ignition, High-Tension, Automotive. Covers one type and one grade; and conductor shall comprise 19 copper wires each wire covered with lead-alloy coating. Gives requirements for insulation, braid, date and identification markers, size, finish, and rejection; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 48-40; 1942. Cable; Steel Tape Armored.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 48-3H; 1940. Cable; Submarine Mine, 1-Conductor.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 90-12; 1942. Cable; Low Tension, Automotive.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-50-B; 1922. Cable; Radio-Frequency.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-250H; 1937. Cable; Switchboard, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-427D; 1943. Cable WC-601 to WC-614, Inclusive.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-428C; 1932. Cable; Types WC-621 to WC-634, Inclusive, Power.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-429D; 1937. Cable; Types WC-641 to WC-654, Inclusive, Power.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-430B; 1931. Cable; Types WC-661 to WC-674, Inclusive, Power.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-438A; 1931. Cable; Types WC-512, Rubber-Insulated, Lead-Covered.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-453; 1928. Cable; Type WC-358, Armored Submarine.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-457; 1928. Cable; Telephone Wire Center, for Balloon.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-460C; 1928. Cable; Types WC-444, WC-445, and WC-446, for Aerial and Underground Use.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-470B; 1933. Cable; Type WC-513, Special Telephone Cable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-485; 1935. Cable; Lead-Covered, Rubber-Insulated.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-490; 1939. Cable; Telephone, Nos. 19 and 22 A. W. G., Paper- or Pulp-Insulated, Lead-Covered, and Armored.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-586E; 1938. Cable; Telephone, Submarine, No. 19, A. W. G.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-628A; 1935. Cable; Type WC-447 to WC-450, Inclusive, Telephone, No. 24 A. W. G., Lead-Covered.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-638D; 1939. Cable; Types WC-411 to WC-429, Inclusive, Telephone, No. 22 A.W.G., Lead-Covered.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-680A; 1937. Cable; Type WC-372, Telephone, No. 19 A.W.G., 50-Pair Quadded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-690; 1934. Cable; Types WC-507, WC-508, and WC-531, No. 19 A.W.G., Rubber-Insulated, Lead-Covered.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-722A; 1938. Cable; Switchboard, No. 22 A.W.G., Textile-Insulated and Lead-Covered.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-725; 1935. Cable; Telephone, 64-Pair, 16 and 19 A.W.G., Quadded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1129; 1942. Wire W-129.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1177; 1943. Cable WC-547-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1179; 1943. Cable WC-549-( ); 50-Ohm, Radio-Frequency, Low Loss, Solid-Dielectric, Semiflexible, Coaxial.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1180; 1943. Cable WC-550-( ); 95-Ohm, Radio-Frequency, Low-Loss, Solid-Dielectric, Semiflexible, Twin-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1195; 1943. Cable WC-551-( ); 95-Ohm, Radio-Frequency, Low-Loss, Solid-Dielectric, Semiflexible, Twin-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1196; 1943. Cable WC-562-( ); 70-Ohm, Radio-Frequency, Low-Loss, Solid-Dielectric, Semiflexible, Coaxial.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1709; 1943. Cable; General Specification for, Radio-Frequency, Low-Loss, Solid-Dielectric, Semiflexible.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1710; 1943. Cable WC-552-( ); 70-Ohm, Radio-Frequency, Low-Loss, Solid-Dielectric, Semiflexible, Coaxial.

References.—Electric cord, *see* 715.42; copper wire, bare and insulated, *see* 715.44; cable terminology, rubber insulation, wire tables and gages, *see* 715.40; wiring methods and practice, *see* 715.30; definitions, symbols, methods of test, service standards, safety codes, *see* 710; copper bars, copper rods for wire drawing, *see* 641.11, 642.11; methods of testing and general requirements for metals, *see* 641.0, 600.1; zinc coatings, tin coatings, *see* 600.3; methods of testing rubber goods, *see* 200; pig lead, *see* 651.1; rubber insulation and tapes, *see* 719.55; insulating cloths and tapes, *see* 719.56; insulating paper, asbestos insulation, *see* 719.52, 719.51; methods of testing cable splicing and pothead compounds, *see* 719.50; cable reels, *see* 715.36.

715.42 Cords, Electrical

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-11; 1924. Single Conductor Cord AAR-5-A. For use in telephone switchboards of the pin jack type, size of wire and number of strands for conductor, thickness of rubber insulation, asbestos braiding, and outer cotton braid, tests, and detailed dimensional drawing of cord and assembly.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-28; 1927. Double Conductor Patching Cord AAR-2-A. For use with telephone switchboards of pin jack type, consisting of two tinsel conductors with filler of twine, covered with two braidings of green glazed cotton; gives requirements for winding in three strands, colors of conductor thread, reinforcement braiding, number and thickness of copper tinsel ribbons, terminals, finish, tests, and dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-29; 1927. Double Conductor Switchboard Cord AAR-3-A. For use in cutting in operator's sets in telephone switchboards, consisting of two copper tinsel conductors with filler of twine, covered with two braidings of green glazed cotton, each conductor made of three strands wound spirally, colors of conductor thread, reinforcement braiding, terminals, finish, tests, and dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-32; 1928. Reverse Double Conductor Cord AAR-4-A. For use with pin jack type switchboards, consists of two copper tinsel conductors and twine filler covered with green glazed cotton braid, each conductor made of three strands wound spirally, colors of conductor thread, dimensional drawings of construction, and test requirements for resistance, insulation, and soldering.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-33; 1928. Single Conductor Cord AAR-1-A. For cutting in operators at telephone switchboards, cord consists of one copper tinsel conductor and twine filler covered with white glazed cotton, conductor made in three strands wound spirally, covered with double serving of tussah floss and impregnated with moisture proofing compound, terminals, finish, and test requirements, with dimensional drawings of construction.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-76; 1937. Potential Plug and Cord AAR-1-A. Gives general requirements, material and workmanship, dimensions, finish, assembly, inspection and tests, packing, marking, and warranty.

National Board of Fire Underwriters. National Electrical Code; 1940. American Standards Assn., C1-1940. Conductors. Includes flexible cords and fixture wire, type and thickness of insulation, voltage limits, number and treatment of braid coverings, standard stranding, and approved uses for flexible cords.

Underwriters' Laboratories, Inc. Standard for Cord Sets, 1937. Covers cord sets for use as supply connections for portable appliances rated at 250 volts or less as extension cords for such appliances, in accordance with the National Electrical Code. General; flat-iron, appliance, and general-use cord sets; wiring; strain relief; marking; and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Flexible Cord and Fixture Wire, 1935. Reprinted, 1940. Covers fixture wires and flexible cords, excepting armored cords, of the types recognized by and for the uses indicated in the National Electrical Code. Conductors, insulation, untreated asbestos, impregnated asbestos, impregnated cotton, code rubber, 30 percent rubber, 40 percent rubber, unvulcanized rubber, fibrous coverings, lay of twist, fillers, rubber jackets, individual types of wire and cord, polarity identification, rating, marking, Underwriters' Laboratories inspection of listed products, testing machine for heater cord, samples for test, and test method.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-68; 1944. Cord; Flexible Electrical.

U. S. Gov., Federal Specification J-C-71a; 1944. Cable; Armored (Including Lead Covered Types and Armored Cord); 0 to 600-Volt Service. Gives types, sizes, material and workmanship, general design, copper conductors, insulation, fibrous insulating covering, fibrous sheathing, lead sheathing, steel armor, marking of armor, twisted assemblies, insulated conductor continuity, bushings, flexibility, dielectric strength, armor, electrical resistance, tightness of armor on conductor assembly, armor resistance to stretching, zinc coating of armor; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification J-C-86; 1943. Cable, Cord, and Wire; Electric, Flexible, Cotton-Covered (General Service). Covers four types. Gives detail requirements as to construction; and methods of sampling, inspection, and tests.

U. S. Gov., Treasury Dept., Procurement Div., 320A; 1942. Cord; Hard Service, Rubber Covered, Flexible, Double Conductor. Covers two types—type SJ, 300 volt maximum; and type S, 600 volt maximum; consisting of stranded flexible conductors, a separator, rubber insulation, jute, hemp, soft cotton or rubber filler, and a rubber jacket. Gives requirements for copper wire, diameter, number of strands, separator, rubber insulation, mechanical strength, dielectric strength, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 12-5; 1941. Cord; Flexible, Heater.

U. S. Gov., U. S. Army, Army Air Forces. Specification 12-6; 1941. Cord; Flexible, Rubber-Covered.

U. S. Gov., U. S. Army, Signal Corps. Specification 46-2A; 1941. Cords CD-250A and CD-425; Sound and Flash Ranging.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-18-C; 1931. Cord; Type CP-38.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-158D; 1932. Cord; Types CO-100 to CO-103, Inclusive, No. 18 A.W.G., Rubber Insulated.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-211-C; 1942. Cordage CO-109, CO-110, CO-112 and CO-113; No. 18 A.W.G., Rubber Insulated and Shielded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-212B; 1932. Cord; Type CO-111, 6-Conductor, Nos. 10 and 18 A.W.G., Rubber Insulated and Shielded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-219A; 1930. Cord; Type CO-114, 6-Foot, 2-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-236D; 1930. Cord; Type CO-49, 18-Inch, 2-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-365B; 1929. Cord; Types CC-300, CC-321, CC-322, CC-323, and CC-325.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-394B; 1932. Cord; Type CO-115, 40-Foot, 5-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-416; 1929. Cord; Type CO-116, 100-Foot, Single-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-417; 1929. Cord; Type CO-117, 55-Foot, Single-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-471D; 1938. Cordage; Types CO-98, CO-208, and CO-209.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-539A; 1933. Cord; Types CD-104 and CD-105, 50- and 150-Foot Cables.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-554; 1931. Cord; Type CD-106, 10-Foot, 2-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-562B; 1941. Cord; Type CD-107, Power, 2-Conductor, No. 12 A.W.G.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-571C; 1940. Cord; Electric, Tinsel, Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-599; 1931. Cord; Type CO-53, 11 1/2-Foot, Single-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-604B; 1932. Cord; Type CD-108, 10-Foot, 4-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-605B; 1932. Cord; Type CO-71, 3-Foot, Single-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-606-A; 1931. Cord CO-72.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-676A; 1936. Cord; Type CD-124, Radio, Headset, Extension.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-684A; 1937. Cord; No. 18 A.W.G., Close Spiral Construction.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-700A; 1936. Cordage; Shielded, Rubber-Insulated and Jacketed, Radio Power.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-802D; 1939. Cordage CO-119; Electrical, 2-Connector, Rubber-Jacketed.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-814A; 1935. Cordage; Type CO-159, Electrical, 2-Conductor, Shielded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-817B; 1936. Cordage; Type CO-120 and CO-150, Electrical, 8-Conductor, Shielded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-818C; 1938. Cordage; Type CO-121, Electrical, 2-Conductor, Shielded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-826A; 1938. Cordage; Type CO-122, Electrical, 3-Conductor, Rubber-Jacketed.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-827A; 1937. Cordage; Type CO-127, Electrical, No. 14 A.W.G., 2,000-Volt, Shielded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-828; 1935. Cordage; Type CO-140, Electrical, Multi-Conductor, Jacketed.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-829; 1935. Cordage; Type CO-141, Electrical, 2-Conductor, Rubber-Jacketed.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-830; 1935. Cordage; Type CO-147, Electrical, Single-Conductor, 2,000-Volt, Rubber Insulated.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-880; 1942. Cordage; CO-219, 2-Conductor, Close Spiral Construction, A. W. G. No. 23, Rubber-Jacketed.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-886A; 1942. Cordage CO-122A and CO-122B; 3-Conductor, A.W.G. No. 22 or No. 20, Close Spiral Construction, Rubber-Jacketed; also Cords, CO-76A and CO-76B.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-935C; 1943. Cords and Cordage; No. 20 A.W.G., Close Spiral Construction.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-971; 1939. Cord; Type CD-318.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1019; 1943. Cords and Cordage; Multipair, Rubber Insulated and Jacketed.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1105; 1942. Cordage CO-119-A and CO-119-B; 2-Conductor, Close-Spiral Construction, A.W.G. No. 20 or No. 22, Rubber-Jacketed.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1139-A; 1943. Cord CD-508.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1175; 1942. Cord CD-495, for Use With Electromagnetic Microphone-Headset.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1525; 1942. Cord CD-604 and CD-605.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1616; 1944. Cordage CO-212; No. 8 A.W.G., Concentric Battery Cable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1625; 1943. Cord CD-786.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1653A; 1944. Cord Assembly RC-243 and Cord Assembly RC-244.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1654; 1944. Cords and Cordages; Intercommunication and Monitoring (for Radio Direction Finder Central TC-8 and Radio Intercept Central TC-9.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1662A; 1944. Antenna Cords and Junction Boxes (for Radio Direction Finder Central TC-8 and Radio Intercept Central TC-9).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1697; 1943. Cord CD-189.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-5059; 1944. Cord CX-179/AIC; Retractable, for Use in Aircraft.

References.—Electric cables, *see* 715.41; copper wire, bare and insulated, *see* 715.44; terminology, rubber insulation, wire tables and gages, *see* 715.40; wiring methods and practice, *see* 715.30; definitions, symbols, methods of test, service standards, safety codes, *see* 710; copper bars, copper rods for wire drawing, *see* 641.11, 642.11; methods of test and general requirements for metals, *see* 641.0, 600.1; zinc coatings, tin coatings, *see* 600.3; methods of testing rubber goods, *see* 200; rubber insulation and tapes, *see* 719.55; insulating cloths and tapes, *see* 719.56; asbestos insulation, *see* 719.51.

715.43 High Resistance Wires

American Institute of Electrical Engineers, 46; 1927. American Standards Assn., C11-1927. Hard Drawn Aluminum Conductors. Standard values of resistivity, resistance-temperature coefficient, density, and length-temperature coefficient and explanatory notes.

American Society for Testing Materials, A111-43; 1943. American Standards Assn., G8.3-1944. Zinc-Coated (Galvanized) Iron or Steel Telephone and Telegraph Line Wire. For signal transmission wire where electrical characteristics are important. Requirements for zinc coating, base metal, joints, sampling, tests for uniformity and weight of coating, adherence of coating, breaking strengths of 4 to 14 B.W.G. wire, elongation, twists, resistivity, size and permissible variations, finish and inspection.

American Society for Testing Materials, A 112-33; 1933. American Standards Assn., G8.4-1935. Zinc-Coated (Galvanized) Iron or Steel Tie Wires. For use in tying galvanized telephone or telegraph line wire to insulators. Describes zinc for coating, weight and uniformity of coating, adherence, tensile strength, elongation, sizes and permissible variations, and packing.

American Society for Testing Materials, B 70-39; 1939. Method of Test for Change of Resistance With Temperature of Metallic Materials for Electrical Heating. Applicable over the range of service temperatures; test specimen and leads, electric furnace, resistance measurements, test current, method of procedure for test and preparation of temperature-resistance curve, and singular points in curve.

American Society for Testing Materials, B 76-39; 1939. Method of Accelerated Life Test for Metallic Materials for Electrical Heating. For determining resistance to oxidation at high temperatures under intermittent electrical heating of wire through a prescribed temperature range. Arrangement of test panel, apparatus required, size of specimen, ballast resistance, temperature of test, procedure, and recording of results.

American Society for Testing Materials, B 77-33; 1933. Method of Test for Thermoelectric Power of Electrical-Resistance Alloys. For determination of thermoelectric power of a metal compared to copper, between 0 and 100° C., for suitability for use in resistance apparatus. Includes preparation of test specimen, measurement of temperature, electromotive force, polarity of metal, and form of report.

American Society for Testing Materials, B82-41; 1941. Drawn or Rolled Alloy, 80 Percent Nickel, 20 Percent Chromium, for Electrical Heating Elements. Covers annealed, drawn, or rolled shapes. Gives heat treatment, chemical composition, chemical analysis, elongation, nominal resistivity, test for resistivity, resistance increase with temperature, test for change of resistance, durability, finish, packing, and marking.

American Society for Testing Materials, B83.41; 1941. Drawn or Rolled Alloy, 60 Percent Nickel, 15 Percent Chromium, and Balance Iron, for Electrical Heating Elements. Cover annealed, drawn, or rolled shapes. Heat treatment, chemical composition, chemical analysis, elongation, nominal resistivity, test for resistivity, resistance increase with temperature, test for change of resistance, durability, finish, packing, and marking.

American Society for Testing Materials, B 84-36; 1936. Method of Test for Temperature-Resistance Constants of Alloy Wires for Precision Resistors. For use in the temperature range 0 to 80° C., selection of sample, terminals, apparatus required, neutral oil bath, temperature measurements, resistance measurements, test procedure, calculation of constants, and form of report.

American Society for Testing Materials, B 114-39; 1939. Method of Test for Temperature-Resistance Constants of Sheet Materials for Shunts and Precision Resistors. For determining constants of materials used in temperature range 0 to 80° C. Requirements for test specimen, terminals, manganin samples, apparatus, baths, temperature and resistance measurements, procedure, and form of report.

American Society for Testing Materials, B 118-42 T; 1942. Tentative Methods of Testing Nickel and Nickel-Alloy Wire and Ribbon for Electronic Tube Filaments. For wire or ribbon without chemical coating; method of chemical analysis, density and tensile strength requirements, test specimen, procedure, weight, resistivity, and determination of demensions.

Assn. of American Railroads, Operations and Maintainance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 22-39; 1939. Galvanized E.B.B. Steel Bonding Wire. No.8 steel wire for bonding rail joints where track circuits are used. Gives properties test of galvanizing, inspection, etc.

Assn. of American Railroads, Operations and Maintainance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 196-40; 1941. Copper-Bearing Steel Wire With or Without Weather-Resistant Covering. Requirements for galvanized copper-bearing steel line wire for use on signal circuits. Conductor in accordance with A.A.R. Telegraph and Telephone Section Specification 1-A-53 and covering with American Standard C8.18, except as to thickness. Acceptance tests required and table of weights of bare and finished wire.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-16; 1927. Galvanized Iron Tie Wires. Includes Nos.8 and 9 B.W.G. wire, elongation, and breaking strain of soft wire, galvanized to meet requirements of A.A.R. Specification 1-D-5.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-53; 1935. Galvanized Copper Bearing Steel Line Wire. Includes five sizes from 4 to 12 B.W.G., requirements as to composition, permissible variations in size, tensile strength, elongation, torsion, galvanizing, resistivity, and tests.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-81; 1942. No.16 A.W.G. Copper-Covered Steel Distributing Wire—Single and Twisted Pair. For use in the communication plant. Gives general requirements, material and workmanship, physical requirements, electrical requirements, inspection and tests, packing, marking, and warranty. Emergency Alternate 1-A-81 EA-2; 1944, changed 1-A-81, in order to conserve critical and scarce materials during the war period.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C 8.15-1942. Specifications for Metallic Coverings for Insulated Wires and Cables. Apply to metallic coverings, together with the necessary beddings and protective coverings, for power and lighting circuits. Gives requirements for lead sheath, core covering for nonleaded cable, jute bedding for armored cable, flat steel tape armor, galvanized steel wire armor, interlocked steel tape armor, jute serving over lead sheath, duck tape over lead sheath, and braid over lead sheath.

International Municipal Signal Assn., Inc. Specification No.27; 1942. Weather Resistant (Weatherproof) Signal Line Wire 30 Percent Conductivity Bronze Conductor. Covers weather resistant (weatherproof) signal line wire for use in fire alarm, police signal, and other municipal signal systems. Gives requirements for material, conductor, fibrous covering, saturant, finish, mineral filler, acceptance requirements, samples for test, identification, packing and marking for shipment, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification No.28; 1942. Weather Resistant (Weatherproof) Signal Line Wire With 30 Percent or 40 Percent Conductivity Copper Covered Steel Conductors. Covers weather resistant (weatherproof) signal line wire for use in fire alarm, police signal, and other municipal signal systems. Gives requirements for material, conductor, fibrous covering, saturant, finish, mineral filler, acceptance requirements, samples for test, identification, packing and marking for shipment, inspection and tests, and rejection.

Underwriters' Laboratories, Inc. Bulletin of Research, 25; 1942. Performance of Rubber Insulation of Building Wire in One-Year Oven Tests. This bulletin describes one-year oven tests of rubber insulation of building-wire of several new types, conducted to determine if their performance under test at the maximum temperatures recognized by the National Electrical Code would indicate proper performance under field conditions. Covers description of samples, methods of test, results of tests, analysis of test results, and summary.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-8a; 1943. Wire; Iron and Constantan, Thermocouple.

U. S. Gov., Federal Specification QQ-W-421; 1938. Wire; Steel, Copper-Covered. Covers three types—(I) high strength 40 percent conductivity, (II) high strength 30 percent conductivity, and (III) extra high strength 30 percent conductivity. Gives requirements for material, physical requirements, and electrical resistivity; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 17W2b; 1941. Wire (and Ribbon); Resistance.

U. S. Gov., Navy Dept. Specification 47N1a; 1938. Wire, Nickel-Chromium-Iron-Alloy; Bars; Forgings; Rods; Shapes; Sheets; Strips.

References.—Copper wire, bare and insulated, *see* 715.44; terminology, wire tables and gages, *see* 715.40; wiring methods and practice, *see* 715.30; definitions, symbols, methods of test, service standards, safety codes, *see* 710; methods of test and general requirements for metals, *see* 600.1; zinc coatings, tin coatings, *see* 600.3; asbestos insulation, *see* 719.51; resistors, electric heaters, *see* 714.12, 717.1.

715.44 Low Resistance Wires

American Institute of Electrical Engineers. Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C8.5-1936, C8.6-1936, and C8.7-1936. Specifications for Cotton Covered Round Copper Magnet Wire. Specifications for Silk Covered Round Copper Magnet Wire. Specifications for Enameled Round Copper Magnet Wire. Requirements on manufacture; properties and tests with maximum and minimum dimensions of wire as used in the manufacture of electrical apparatus.

American Society for Testing Materials, B 1-40; 1940. American Standards Assn., H4.2-1941. Hard-Drawn Copper Wire. Gives requirements for tensile properties, resistivity, dimensions and permissible variations, density, and explanatory notes.

American Society for Testing Materials, B 2-40; 1940. American Standards Assn., H4.3-1941. Medium-Hard-Drawn Copper Wire. For material and tensile requirements, resistivity, dimensions and permissible variations, density, joints, and explanatory notes.

American Society for Testing Materials, B 3-41; 1941. Society of Automotive Engineers Specification No. 83. American Standards Assn., H4.1-1942. Soft or Annealed Copper Wire. Covers drawn and annealed or soft round bare copper wire for electrical purposes. Material, tensile properties, resistivity, dimensions, density, joints, finish, packing and shipping, and inspection.

American Society for Testing Materials, B 9-39; 1939. American Standards Assn., H4.5-1940. Bronze Trolley Wire. For round and grooved trolley wire from three classes of bronze; gives requirements for materials, tensile properties, twist tests, dimensions and permissible variations, resistivity, and standard sections of wire.

American Society for Testing Materials, B 33-39; 1939. American Standards Assn., H4.4-1940. Tinned Soft or Annealed Copper Wire for Electrical Purposes. Requirements for pure tin coated wire, tensile properties, resistivity, dimensions and permissible variations, continuity of coating, specimens and procedure for coating tests, mechanical test for adhesion of coating, and explanatory notes.

American Society for Testing Materials, B 47-39; 1939. American Standards Assn., H4.6-1940. Copper Trolley Wire. For round and grooved trolley wire; requirements as to material, tensile properties, twist test, standard sections, dimensions and permissible variations, resistivity, density, and explanatory notes.

American Society for Testing Materials, B 48-42; 1942. Soft Rectangular and Square Copper Wire for Electrical Conductors. Covers soft or annealed wire with rounded corners, in two types, for edgewise bending, and other applications. Requirements for manufacture, tensile properties, bending properties, resistivity, dimensions, and permissible variations.

American Society for Testing Materials, B 105-39; 1939. Hard-Drawn Copper Alloy Wires for Electrical Conductors. Covers ten grades based on conductivity; requirements for material, chemical composition, tensile properties, resistivity, density, dimensions and permissible variations.

American Society for Testing Materials, B 116-40; 1940. Figure-9, Deep-Section Grooved and Figure-8, Copper Trolley Wire for Industrial Haulage. Gives requirements for material, tensile properties of various sizes, standard sections, dimensions and permissible variations, resistivity, density, finish, and explanatory notes.

American Society for Testing Materials, B180-43T; 1943. Tentative Method of Test for Density of Fine Wire and Ribbon for Electronic Devices. Covers a procedure for determining, to an accuracy of 0.1 percent, the density of fine wires ranging from 0.010 to 0.001 in. in diameter, or ribbons of similar thicknesses for electronic devices. Gives definitions and requirements for apparatus, test liquid, test specimen, preparation of specimen, procedure, calculation, and report.

American Society for Testing Materials, B 189-44T; 1944. Tentative Specification for Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes. Gives scope, material, tensile properties, resistivity, dimensions and permissible variations, continuity of coating, ammonium persulfate test for continuity of coating; sodium polysulfide-hydrochloric acid test for continuity of coating, joints, finish, packing and shipping, inspection, and rejection.

American Society for Testing Materials, D 27-41; 1941. Insulated Wire and Cable: Class AO, 30 Percent Hevea Rubber Compound. Requirements for conductor material, strand, stranding, tensile properties, conductivity, and tinning tests; insulation composition, physical and electrical tests; shielding; cable tape; braid; finish, saturant, flame, moisture, and bending tests; lead sheaths; inspection and rejection; annealed copper standard; and interpretation of insulation thicknesses table. A.S.T.M. Emergency Alternate Provision EA-D 27a; 1944, affected section 2, Conductor Material; section 7, Tinning Test; section 25, Cable Tape Material; section 28, Types of Cotton Braid; section 29, Standard Braid; section 30, Cotton Braid Material; section 31, Cotton Braid Construction; table IX, Values of Y for Code Braids; and table X, Typical Braid Construction.

American Society for Testing Materials, D 353-41; 1941. Insulated Wire and Cable: Performance Rubber Compound. Except for insulation, conforms to A.S.T.M. Designation D27. Methods of test, physical properties, high voltage test, insulation resistance, moisture absorption, thickness, workmanship, and rejection. A.S.T.M. Emergency Alternate Provision EA-D 353; 1942, affected section 1, Scope; table I, Physical Test Requirements for Insulation; and table III, Insulation Resistance.

American Society for Testing Materials, D469-41; 1941. Insulated Wire and Cable: Heat-Resisting Rubber Compound. For use at temperatures not in excess of 75° C., except rubber insulation conforms to A.S.T.M. Designation D27. Methods of test, physical properties, high-voltage test, insulation resistance, moisture absorption, thickness, workmanship, rejection, and interpretation of insulation thickness table. A.S.T.M. Emergency Alternate Provision EA-D469a; 1943, affected section 1, Scope.

American Society for Testing Materials, D 470-41; 1941. Methods of Testing Rubber Insulated Wire and Cable. Describe procedures for the testing of rubber-insulated wire and cable. They are not to be considered completely applicable to all types of wire and cable, nor do they necessarily include every test applicable to a particular type. To determine the tests to be made on a particular wire or cable, reference should be made to the specifications for that type. Physical and electrical tests of insulation, and tests on finished wire and cable.

American Society for Testing Materials, D574-40T; 1940. Tentative Specifications for Insulated Wire and Cable: Ozone-Resistant Type Insulation. Except for insulation, conforms to A.S.T.M., D27. Physical properties, high-voltage test, insulation resistance, double-voltage test on short samples, cold-bend, long-time voltage test, capacity and power factor tests, ozone-resistance test, and thickness of insulation. A.S.T.M. Emergency Alternate Provision EA-D574b; 1944, affected section 1(b), Scope.

American Society for Testing Materials, D734-43T; 1943. Tentative Specifications for Insulated Wire and Cable: Polyvinyl Insulating Compound. Covers wire and cable insulated with a thermoplastic synthetic insulating compound made from polyvinyl chloride or its copolymer with vinyl acetate. Gives material, strand, shape, stranding, permissible variations in diameter and area, coating test, sampling and methods of test, test specimens, physical properties, heat shock test, heat distortion test, flame-retardant properties, oil resistance test, cold bend test, high-voltage test, insulation resistance, thickness of insulation, workmanship, and rejection.

American Society for Testing Materials, D754-43T; 1943. Tentative Specifications for Insulated Wire and Cable: Heat-Resisting Synthetic Rubber Compound. Intended to permit the use of the compound known as "Government Rubber," type GR-S, but are not restricted to this type. Gives physical properties, high-voltage test, insulation resistance, thickness, workmanship, rejection, and methods of testing.

American Society for Testing Materials, D755-44T; 1944. Tentative Specifications for Insulated Wire and Cable: Performance Synthetic Rubber Compound. Intended to permit the use of the compound known as "Government Rubber," type GR-S, but are not restricted to this type. Gives physical properties, high-voltage test, insulation resistance, thickness, workmanship, rejection, and methods of testing.

American Transit Assn. Copper Wire Tables, D1-32; 1932. Gives two complete wire tables for standard annealed copper in English and metric units, and one working copper wire table in English units.

American Transit Assn. Specification for Copper Trolley Wire, D2-38; 1938. These specifications cover round and grooved hard-drawn copper trolley wire. Include physical properties and tests, dimensions and permissible variations, finish, packing, and inspection and rejection.

American Transit Assn. Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Class A Compound, D10-41; 1941. Apply to the rubber compound used for the insulation of electric wire and cable, and which is known as class A 30 percent Hevea rubber. Gives requirements as to conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

American Transit Assn. Specification for Bronze Trolley Wire, D12-38; 1938. Covers round and grooved bronze trolley wire. Covers requirements of manufacture of three classes of wire, physical properties and tests, dimensions and permissible variations, finish, packing, and inspection and rejection. This specification was prepared under the joint auspices of the American Transit Engineering Assn., the Assn. of American Railroads, and the American Society for Testing Materials.

American Transit Assn. Recommended Specification for Stud Terminal Copper Rail Bonds, D110-31; 1931. This specification is to provide for the manufacture and delivery of rail bonds of the stud terminal type for the bonding of track rails forming the negative return in electric traction systems. It includes definition of terms, manufacture of materials, physical properties and tests, satisfactory dimensions, packing, and inspection and rejection.

American Transit Assn. Recommended Specification for Weather-Resistant Weatherproof Wire and Cable U.R.C. Type, D114-41; 1941. These specifications cover weather-resistant, weatherproof wire and cable, the conductors, the materials used for the fibrous coverings, and the saturating and finishing compounds. Covers materials and properties, acceptance requirements, general requirements, and appendix.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for General Purposes—Code Rubber Insulation, D116-41; 1941. This specification applies to the rubber compound used for insulation of electric wire and cable and which is known as code rubber insulation. Covers general requirements, conductor, insulation, cable tape, braid, finish, lead sheaths, and armor.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Class AO Compound, D117-41; 1941. These specifications apply to the rubber compound used for the insulation of electric wire and cable and which is known as Class AO 30 percent Hevea rubber. Covers general requirements, conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Performance Rubber Compound, D118-41; 1941. This specification is intended to cover the furnishing and testing of various kinds of rubber insulated conductors for power distribution purposes, the insulation to be of the grade known as Performance Rubber Compound. Covers general requirements, conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1940. Electric Trainline for Air Brake Control. Lists terminal designation, wire size, and the color code for wires in cars and in jumper cable between cars. Color code conforms to N.E.M.A. Standard.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 4-e-42; 1942. Specifications for Rubber Insulated Wires and Cables No. 18 A.W.G. and Larger. Gives general requirements, standards for rubber covered wires and cables conductors, separator, rubber compounds, cable tape, cable assembly, cotton braids, metallic coverings, shipment on cable reels, shipment on coils, and details.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1937. Specification for Bronze Guy and Messenger Strand.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 70-39; 1939. Forty Per Cent Conductivity Copper-Covered Steel Bonding Wire. No. 6 wire for bonding rail joints where track circuits are used, gives general requirements as to fabrication, elongation, inspection, and test.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 108-20; 1921. Copper Bond Wire. Soft drawn No. 6 wire, 98 percent pure copper; elongation and testing.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 167-41; 1942. Copper-Covered Steel Wire With or Without Weather-Resistant Covering. Includes requirements for 30 percent conductivity wire for use on signal circuits, sizes No. 4 to 12 A.W.G. Requirements for bare wire, for weather-resistant covering in accordance with American Standards Assn., C8.18, except for thickness, and gives acceptance tests required with table of weights of bare and finished wire.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 168-40; 1941. Copper Alloy Wire With or Without Weather-Resistant Covering. Provides for A.S.T.M. grade No. 30 wire, for use on signal circuits, in accordance with A.S.T.M. Specification B 105. Covering to meet American Standard C8.18, except as to conductor, inspection, and table of weights of sizes No. 4 to 10 A.W.G., bare and finished, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 169-40; 1941. Hard-Drawn Copper Wire With or Without Weather-Resistant Covering. For use on signal circuits; requirements for conductor meeting A.S.T.M. Specification B 1, except as noted, covering accordance with American Standards Assn. C8.18, except as to thickness acceptance tests, and table of weights of bare and finished wire.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 192-40; 1941. Single-Conductor, Asbestos Varnished-Cambric Insulated Signal Wire With Flame-Retarding Braid Covering. For use in weather protected locations on circuits rated at 0-600 volts; requirements for oil protective separator if stranded, varnished cambric, felted asbestos, and flame-retarding braid covering; table for 0000 to 18 A.W.G. sizes; for conductor meeting A.S.T.M. Specifications B 33 and D 27 paper or cellophane separator, varnished cloth in accordance with specifications of the Insulated Power Cable Engineers Assn., braid covering same as A.A.R. Signal Section Specification No. 191, and tests.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 193-40; 1941. Enameled Copper Magnet Wire. Provides for soft or annealed magnet wire for use in manufacture of electrical signal apparatus, conductor and insulation to meet requirements of the American Standards Assn. C8.7.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 194-40; 1941. Cotton-Covered Copper Magnet Wire. Provides for soft or annealed copper magnet wire for use in manufacture of electrical signal apparatus. Requires that wire be in accordance with American Standards Assn. C8.5.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 195-40; 1941. Silk-Covered Copper Magnet Wire. For wire used in the manufacture of electrical signal apparatus; provides tests for wire having conductor and insulation in accordance with American Standards Assn. C8.6.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-13; 1927. Hard-Drawn Bare Copper Wire. Covers quality of material and workmanship; physical, mechanical, and electrical requirements; weights of wire coils, for two sizes of B.W.G. and five sizes of A.W.G.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-15; 1927. Annealed Copper Tie Wires. For material and workmanship; list of physical and mechanical requirements for six sizes of wire.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-39; 1930. No. 14 A.W.G. Hard-Drawn Copper Outside Distributing Wire. For single conductor or twisted pair wire, each wire insulated and covered with weatherproof braid; requirements for diameter of bare wire, tinning, insulation, braid, weatherproofing, tensile strength, resistance, adhesion, elasticity of insulating compound, aging, electrical, and melting tests.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-45; 1931. Bronze Line Wire. Includes Nos. 6, 8, 9, and 10 A.W.G. bare, hard-drawn, bronze line wire, 1 percent cadmium; diameters, permissible variations, breaking strength, elongation, resistance, nominal weights per mile, bend test, and finish.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-52; 1935. Bronze Guy and Messenger Strand. Includes three sizes of 7-strand copper-base alloy, requirements as to breaking strength, bending, joints, stranding, pitch, and physical tests.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-79; 1941. No. 16 A.W.G. Copper Bridle Wire. For use in the communication plant. Gives general requirements, material and workmanship, physical requirements, electrical requirements, inspection and tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-80; 1941. Flat Copper Wire. For use in the communication plant. Gives general requirements, material and workmanship, physical requirements, inspection and tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-91ES; 1943. No.16 A.W.G. Copperweld Synthetic Insulated Distributing Wire—Single and Twisted Pair. This emergency specification has been prepared as an alternate for rubber insulated wire, for the war period. Gives general requirements, material and workmanship; physical requirements, electrical requirements, inspection and test, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-15; 1925. Twisted Pair Waxed Braid Rubber Insulated Inside Wire. Covers Nos.16 and 18 A.W.G. tinned copper wire, requirements as to quality of Hevea rubber insulation, glazed two-ply cotton braid, weatherproofing saturant, color, and tests for mechanical strength, adhesion of braid, electrical properties, and composition of insulation.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-16; 1925. Single Conductor Waxed Braid Rubber Insulated Inside Wire. Includes Nos.16 and 18 A.W.G. solid tinned copper wire, quality of rubber, hard glazed cotton braid, weatherproofing saturant, manufacturing process, and requirements for tinning, tensile strength of rubber, adhesion, and electrical tests.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-67; 1932. Flameproof Cross-Connecting Wire. Covers Nos.16 and 18 A.W.G. conductors of single, twisted pair or quadded types, rubber insulated, flameproof braid, solid tinned copper wire. Quality of materials, construction, colors of braid, physical and electrical tests.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-85 ES; 1943. Twisted Pair Synthetic Insulated Inside Wire. This emergency specification has been prepared as an alternate for rubber insulated wire, for the war period. Gives general requirements, material, manufacture, tests, inspection, packing, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-86 ES; 1943. No.20 and No.22 A.W.G. Twisted Pair Synthetic Insulated Braid Covered Inside Wire. This emergency specification has been prepared as an alternate waxed braid rubber insulated wire, for the war period. Gives general requirements, material, manufacture, tests, inspection, packing, and warranty.

Copper Wire Engineering Assn. Properties of Copper Wire (Bare-Solid, Hard-Drawn), No.401; 1938. Covers wire sizes 1 to 12 A.W.G.; gives diameters, resistance, cross-sectional area, weight and breaking strength. Based on A.S.T.M. Specification B1.

Copper Wire Engineering Assn. Properties of Type A Copperweld-Copper Conductors, No.401; 1938. For three-wire conductors composed of one copperweld wire and two hard-drawn wires; table covers equivalent H.D. stranded copper conductance, resistance, stranding, cross-sectional area, weight and breaking strength. Also gives ice and wind loads (vertical, horizontal, and resulant, in pounds per linear foot). For sizes 2A to 8A, 8C, 9 1/2D, 3 No.10, 3 No.11, and 3 No.12 A.W.G.

Electrical Standards Committee, sponsor. American Standards Assn., C8.5-1936. Cotton-Covered Round Copper Magnet Wire. For use in manufacture of electrical apparatus; requirements for materials, manufacture, properties, and tests.

Electrical Standards Committee, sponsor. American Standards Assn., C8.6-1936. Silk-Covered Round Copper Magnet Wire. For use in manufacture of electrical apparatus; requirements for materials, manufacture, properties, and tests.

Electrical Standards Committee, sponsor. American Standards Assn., C8.7-1936. Enameled Round Copper Magnet Wire. For use in manufacture of electrical apparatus; requirements for materials, manufacture, properties, and tests.

Electrical Standards Committee, sponsor. American Standards Assn., C8.9-1942. Slow-Burning Wire and Cable. Covers scope, conductors, fibrous covering, filling and finish of coverings, acceptance tests, samples for test, identification, packing and marking, inspection, rejection, and weight of copper conductors and complete coverings.

Electrical Standards Committee, sponsor. American Standards Assn., C8.12-1942. Cotton Braid for Insulated Wire and Cable for General Purposes. Specification covers braids as applied to rubber and varnished cloth insulated wires and cables. They do not cover "fancy" or special braids or braids for fixture wire or weather-resisting wire and cable. Three classes—heavy, for outdoor or rough service; standard, for indoor or protected service; and code, for installation under the National Electrical Code. Gives detailed requirements for materials, construction, and measurement.

Electrical Standards Committee, sponsor. American Standards Assn., C8.15-1942. Specifications for Metallic Coverings for Insulated Wires and Cables. Apply to metallic coverings, together with the necessary beddings and protective coverings, for power and lighting circuits. Gives requirements for lead sheath, core covering for nonleaded cable, jute bedding for armored cable, flat steel tape armor, galvanized steel wire armor, interlocked steel tape armor, jute serving over head sheath, duck tape over lead sheath, and braid over lead sheath.

Electrical Standards Committee, sponsor. American Standards Assn., C8.16-1940. A.I.E.E. Standard C8.16. Specifications for Rubber-Insulated Tree Wire Coverings. Tree wire is defined as a wire or cable having a solid or stranded conductor insulated with a material such as rubber compound and having a covering which is especially resistant to weather and to abrasion. Requirements on materials and properties, abrasion, bend and moisture tests, and inspection and rejection.

Electrical Standards Committee, sponsor. American Standards Assn., C8.18-1942. Weather-Resistant (Weatherproof) Wire and Cable (U.R.C. Type). Covers wire and cable, the conductors, the materials used for the fibrous coverings, and saturating and finishing compounds. Gives requirements for conductors, fibrous covering, saturant, finish, mineral filler, acceptance requirements, samples for test, identification, packing and marking, inspection, and rejection.

Electrical Standards Committee, sponsor. American Standards Assn., C8.19-1939. A.I.E.E. Standard C8.19. Specifications for Weather-Resistant Saturants and Finishes for Aerial Rubber-Insulated Wire and Cable. These specifications cover the physical requirements and performance tests for weather-resistant saturants applied in the fibrous coverings and finishes applied over the saturated fibrous coverings of rubber-covered wire and cable to be used in aerial installation for electric light and power supply.

Electrical Standards Committee, sponsor. American Standards Assn., C8.20-1939. A.I.E.E. Standard C8.20. Specifications for Heavy-Walled Enameled Round Copper Magnet Wire. Heavy-walled enameled round copper magnet wire as used in the manufacture of electrical apparatus.

International Municipal Signal Assn., Inc. Specification No. 6; 1942. Rubber Insulated, Single Conductor, Braid Covered Signal Wire (for Use in Buildings). Covers single conductor, rubber insulated, braid covered cables for use in buildings in fire-alarm, police signal, and other municipal signal systems operating at 600 volts or less. Gives requirements for general construction, conductors, insulation, protective covering, tests on completed wire, identification, packing and marking for shipment, payment for reels, inspection and test, and rejection.

International Municipal Signal Assn., Inc. Specification No. 9; 1942. Single Conductor Street Lighting Cable. Covers rubber insulated single conductor wire or cable in sizes 10 to 4 A.W.G. suitable for series street lighting circuits operating at from 0 to 5,000 volts. Gives requirements for general construction, conductors, insulation, cable tape, protective coverings, electrical tests on completed cable, identification, packing and marking for shipment, payment on reels, and inspection and tests.

International Municipal Signal Assn., Inc. Specification No. 10; 1942. Twisted Pair and Parallel Rubber Insulated Outside Telephone Wire. Covers rubber insulated twisted pair and parallel outside telephone wires for use in fire alarm, police signal, and other municipal signal systems for operation at voltages not exceeding 125 volts a.c. or 259 volts d.c. Gives requirements for general construction, conductors, insulation, braids on conductors, saturant, finish, conductor assembly, tests on completed cable, identification, packing and marking for shipment, payment for reels, inspection and tests, and rejection.

International Municipal Signal Assn., Inc. Specification No. 26; 1942. Weather Resistant (Weatherproof) Signal Line Wire Hard Drawn Copper Conductor. Covers weather resistant (weatherproof) hard drawn copper signal line wire for use in fire alarm, police signal, and other municipal signal systems. Gives requirements for material, conductor, fibrous covering, saturant, finish, mineral filler, acceptance requirements, samples for test, identification, packing and marking for shipment, inspection and acceptance, and rejection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Wire and Cable; Copper. Covers definition, constants (copper wire), general properties, types of wire, prices, packing, and purchase practices.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Conductors. Type and thickness of insulation, voltage limits, number and treatment of braid coverings, and standard stranding for rubber covered wire, varnished cambric insulated wire, asbestos covered and slow burning wire, weatherproof wire, fixture wire, flexible cords, armored cable, nonmetallic sheathed cable. Demand calculations for feeder sizes; approved uses for flexible cords.

National Electrical Manufacturers Assn. Magnet Wire Standards, 36-34; 1936. Includes cotton-covered, silk-covered, and enameled round copper magnet wire—general standards, manufacturing standards, and properties and tests.

National Electrical Manufacturers Assn. Asbestos and Asbestos-Varnished Cambric Insulated Wires and Cables. Standards 39-54; 1939. Covers electrical conductors insulated with asbestos or combinations of asbestos and varnished cambric and finished with cotton braids, asbestos braids, or lead sheaths; requirements as to physical properties, electrical and physical tests, dimensional tables for various voltages, and uses.

National Electrical Manufacturers Assn. Magnet Wire Standards Supplement, 41-69; 1941. Includes requirements for cotton covered, silk covered, and enameled round copper magnet wire; maximum allowable thickness of cotton or silk, method of making joints, manufacture, properties and tests, and tables of properties.

Underwriters' Laboratories, Inc. Bulletin of Research, 25; 1942. Performance of Rubber Insulation of Building Wire in One-Year Oven Tests. This bulletin describes one-year oven tests of rubber insulation of building-wire of several new types, conducted to determine if their performance under test at the maximum temperatures recognized by the National Electrical Code, would indicate proper performance under field conditions. Covers description of samples, methods of test, results of tests, analysis of test results, and summary.

Underwriters' Laboratories, Inc. Standard for Motion Picture Cable and Stove Wire, 1921. Asbestos covered single copper conductors for exposed leads in motion picture machines, on search light controllers, heaters, and other appliances where heat-resistant, flexible, insulating wire is required. Not for use in conduit or under moist conditions. Conductivity, sizes, tinning, stranding, coverings, compound, carbon content, flame and bend test.

Underwriters' Laboratories, Inc. Standard for Slow Burning and Slow Burning Weatherproof Wires and Cables, 1928. For soft annealed copper, concentric stranded, number of strands, number and thickness of cotton braid coverings, saturated with moisture-proof insulating compound, WP marking.

Underwriters' Laboratories, Inc. Standard for Synthetic Insulated Wires. Covers wires having synthetic insulation, for use in accordance with the National Electrical Code, single-conductor employing soft-annealed-copper conductors and having no fibrous coverings. They are made in the Nos. 14-0000 A.W.G. sizes only and are recognized for use at 600 volts or less and at a temperature not higher than 60° C. Gives requirements for sizes; resistance; coating; joints; separator; insulation thickness, physical properties, and deformation; apparatus and specimens for physical tests; physical test procedure; flame-retardant properties; moisture-resistant properties; finish; dielectric strength; insulation resistance; mechanical equivalence to type R rubber-covered wire; and marking.

Underwriters' Laboratories, Inc. Standard for Weatherproof, Slowburning, and Slowburning-Weatherproof Wires. Covers single-conductor weatherproof, slowburning, and slowburning-weatherproof wires for use in accordance with the National Electrical Code. Includes requirements for conductors, coverings, flexibility, melting of compound, dripping of compound, flame retardant properties, and marking.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-388-1. Wire; Emergency, Latex-Covered, Single Conductor.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-388-2. Wire; Emergency, Latex-Covered, Double Conductor.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R180-41; 1941. Copper Conductors for Building Purposes. This recommendation covers a simplified list of stock sizes of copper conductors for building purposes. Sponsored by National Electrical Contractors Assn.

U. S. Gov., Federal Specification J-C-86; 1943. Cable, Cord, and Wire; Electric, Flexible, Cotton-Covered (General Service). Covers four types. Gives detail requirements as to construction; and methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification J-C-103; 1941. Amendment 2; 1944. Cable and Wire; Rubber-Insulated, Building Type (0 to 5,000-Volt Service). The term "rubber" as used throughout this specification includes synthetic rubber. Covers all listed sizes of rubber-insulated wire and cable in two types—(R) code grade, and (RH) heat-resistant grade. Gives requirements for conductors (resistance, sizes, strands, lead coated or lead-alloy coated, splices, and separator); insulation (thickness and physical properties of rubber compound); coverings (fibrous coverings, number of coverings, cotton tapes, cotton braids, cotton wraps or servings, saturation of fibrous coverings, flame-retardant properties, moisture-resistant properties, flexibility, finish, lay of twist, and lead coverings); dielectric strength, insulation resistance, and marking of wire and cable; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification J-C-121; 1935. Cable and Wire; Rubber-Insulated, (for) Other Than Building Purposes, Superaging-Grade (0 to 8,000-Volt Service). Covers four types of single and multiple conductor wires, and cable—braided; lead-covered (with or without protective coverings); armored (with or without lead covering) with interlocking metal, flat metal, round wire, or basket-weave metal; and with nonmetallic sheath. Gives general requirements for conductors (sizes, number of strands), insulation, coverings for wires and cables of the four types, and polarity and identification markers (color scheme for control cables); detail requirements for rubber insulation, tape, and braid; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification J-C-138; 1943. Cable and Wire; Varnished-Cloth Insulated (0 to 5,000-Volt Service). Covers varnished-cloth insulated wires and cables of all wire sizes listed in table and designates four types. Gives requirements for material, resistance, sizes, strands, tinning, splices, separator, insulation, coverings, cabling, dielectric strength, insulation resistance, sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., Federal Specification QQ-W-336; 1937. Wire; Copper, Hard-Drawn and Hard-Rolled. Covers one grade and three types—(I) round, (II) grooved trolley, and (III) other wire of standard sections. Gives requirements for material, sizes, tensile strength, gage, and elongation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification QQ-W-341; 1935. Amendment 1; 1944. Wire; Copper, Soft or Annealed. Covers one grade, untinned. Gives requirements, material, sizes, tensile strength, elongation, electric resistivity, coils and reels or spools; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 15W2c; 1917. Wire; Magnet.

U. S. Gov., Navy Dept. Specification 22W3d; 1945. Wire; Copper, Hard-Drawn and Hard-Rolled.

U. S. Gov., Navy Dept. Specification 22W9a; 1934. Wire; Copper, Soft or Annealed.

U. S. Gov., Treasury Dept., Procurement Div., 260B; 1938. Wire; Asbestos-Insulated. Shall be braided; 600 volts maximum. Covers two classes—(A) solid and (B) stranded. Gives requirements for diameter, tensile strength, elongation, resistivity, stranding, asbestos insulation, physical properties, and electrical properties; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.513; 1941. Wire; Telephone. Covers three types of rubber-insulated wires—(I) twisted pair (1,296 circular mils) for interior use, (II) twisted pair (4,096 circular mils) for outside use, and (III) twisted pair (2,025 circular mils) drop wire for outside use. Gives requirements for details, standard sizes and characteristics of conductors, bronze, rubber insulation, insulation resistance of cables, braid covering, and tests; packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.518; 1941. Wire; Fixture, Asbestos-Insulated. Covers two types—(I) plain white on black finish impregnated asbestos insulation and (II) impregnated asbestos insulation with glazed cotton or rayon braid; two classes—(A) solid and (B) stranded. Gives requirements for sizes, material, conductors, asbestos insulation, braids, flame-resisting properties, dielectric strength, and flexibility; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 57-211; 1923. Wire; Magnet.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-41-A; 1931. Wire; Type W-63-A, Lamp Cord, Single Conductor, No.19.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-128H; 1930. Wire; Types W-117 and 118, Telephone, Inside.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-136A; 1922. Wire; Type W-27, Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-137B; 1941. Wire; Type W-28.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-138D; 1941. Wire; Type W-29 and W-120.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-139-D; 1941. Wire W-30.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-160C; 1941. Wire; Type W-65, No.16 A.W.G., Heavy Rubber Insulated.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-170C; 1932. Wire; Type W-8, 2-Conductor, Tinned.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-171A; 1932. Wire; Type W-10, Paired, Lamp Cord No.10.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-172B; 1932. Wire; Type W-11, Paired, Lamp Cord No.12.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-230-C; 1940. Wire; Type W-6.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-235D; 1932. Wire; Types W-66, W-67, and W-105, Telephone, Flameproof.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-247A; 1929. Wire; Types W-34 and 37, Pot Head and Bridle Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-258B; 1936. Wire; Type W-38, No.17 A.W.G., Twisted Pair, Outside Distributing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-262; 1924. Wire; Bronze, No.17 A.W.G., for Light Open Lines.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-290; 1925. Wire; Types W-100 to W-102, Inclusive, Weatherproof, Hard Drawn Copper.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-311; 1924. Wire; Type W-70, Sound-Ranging.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-312C; 1936. Wire; Type W-69-A, No.22 A.W.G., Twisted-Pair, Rubber-Insulated.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-360B; 1944. Wire; Iron and Steel, Galvanized, for Communication and Construction Purposes.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-372B; 1938. Wire W-7; Annunciator.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-378A; 1932. Wire; Type W-4, Lamp Cord.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-385; 1925. Wire; Type W-24, Bare, Braided, Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-422C; 1932. Wire; Type W-108, Parallel Drop Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-461; 1929. Wire; Type W-72, Single-Conductor, for General Use.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-478E; 1944. Wire W-110-B; Field Wire; Twisted Pair, Buna S Insulated.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-526C; 1941. Wire W-106 and W-106A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-644B; 1936. Wire Instrument; 1-, 2-, and 3-Conductor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-726A; 1940. Wire; Types W-124, W-125, and W-128, No.14 A.W.G., Rubber-Insulated.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-925; 1944. Wire W-130; Wire W-130A; and Wire WD-3/TT (Assault Wire, Twisted Pair).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3012; 1944. Wire W-143 (Long Range, Parallel Pair, Field Wire).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3066-A; 1944. Wire W-153 (Copperclad Steel Line Wire, 0.080 Inch).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3067; 1944. Wire W-154; Copper or Copperclad-Steel Tie Wires.

References.—Electric cables, electric cords, *see* 715.41, 715.42; iron and steel telephone and telegraph wire, resistance wire, *see* 715.43; radio antenna, *see* 713.61; copper bars, copper rods for wire drawing, *see* 641.11, 642.11; terminology, rubber insulation, wire tables and gages, *see* 715.40; wiring methods and practice, *see* 715.30; definitions, symbols, methods of test, service standards, safety codes, for electrical apparatus, *see* 710; methods of testing and general requirements for metals, 641.0, 600.1; methods of testing rubber goods, *see* 200; rubber insulation and tapes, *see* 719.55; insulating cloths and tapes, *see* 719.56; asbestos insulation, *see* 719.51; wires for Christmas tree lighting outfits, *see* 716.39.

715.49 Miscellaneous Wires, Cords, and Cables

U. S. Gov., Army-Navy Aeronautical Specification AN-S-36a; 1944. Shunts; 50 Millivolt External Ammeter.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R56-35; 1935. Carbon Brushes (Carbon, Graphite, and Metal-Graphite) and Brush Shunts. This recommendation establishes a standard for brush shunts, standard lengths, sizes, stranding, and size of terminal. Initiated by Electric Power Club (absorbed by National Electrical Manufacturers Assn.)

U. S. Gov., U. S. Army, Army Air Forces. Specification 48-38; 1941. Wire; Iron and Constantan, Thermocouple.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-11; 1938. Wire; Firing, Round, Rubber Covered, No.18 B. & S. Gage.

U S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-84; 1934. Wire; Ignition, Electric Primer.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-5736G; 1942. Wire; Insulated, Submarine Mine.

715.5 PROTECTIVE APPARATUS FOR ELECTRICAL EQUIPMENT

References.— Fuses, circuit breakers, *see* 714.21, 714.51.

715.50 General Items

Assn. of American Railroads, Telegraph and Telephone Section, 4-1; 1938. Specification for the Electrical Protection of the Communication Plant. Covers characterists and arrangement of apparatus for the protection of employees, equipment, and buildings, in new installations and renewals, including lightning protection, fuses, heat coils, arresters, and grounding; location, application, and illustrations.

Assn. of American Railroads, Telegraph and Telephone Section, 4-8; 1924. Telegraph and Telephone Protector Mountings. Covers mountings for fuses and arresters, operating voltage, dielectric strength, and insulation resistance requirements; and protection against ignition.

Assn. of American Railroads, Telegraph and Telephone Section, 4-9; 1924. Telegraph and Telephone Protectors. For combinations assembled of line fuses, cable arresters, office arresters, and instrument fuses or heat coils.

Assn. of American Railroads, Telegraph and Telephone Section, 4-16; 1936. Pole Arresters. For protection of telegraph and telephone equipment by grounding foreign currents exceeding fixed values; design, material, workmanship, and electrical requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 4-20; 1939. Arrester Relays. Covers design of impedance relay with two sets of contacts and provision for mounting two arresters, for short circuiting arresters grounded by abnormal power induction. Design, material, workmanship, and requirements.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Grounding. Grounding requirements for interior wiring circuits, metal inclosures, and electrical equipment; construction of grounds and permissible resistances, sizes, type and installation of ground wire, and clamps and methods of grounding.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H21; 1937. Joint sponsor with American Institute of Electrical Engineers. American Standards Assn., C5.1-1937, C5.2-1937, and C5.3-1944. Code for Protection Against Lightning. Part I, Protection of Persons (C5.1-1937). Part II, Protection of Buildings and Miscellaneous Property (C5.2-1937). Part III, Protection of Structures Containing Inflammable Liquids and Gases (C5.3-1944). Fundamental principles of protection, materials for lightning rods, requirements on minimum sizes and weights of rods, strength, and electrical resistance of joints, size, and installation of elevation rods, coursing of conductors, number, and location of down conductors, grounding, interconnection of metallic masses, recommendations on structural features of oil and gas tanks for self-protection against lightning.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H35; 1939. American Standards Assn., C2.5-1940. Safety Rules for Radio Installations (Comprising Part 5 of the Fifth Edition, National Electrical Safety Code). Requirements on location, installation, and guarding of antenna and counterpoise, material, and size of lead-in, type of construction at entrance to building, type and size of grounding conductor and ground, protective devices, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M95; 1929. Protection of Electrical Circuits and Equipment Against Lightning. Preliminary report of committee working under auspices of American Standards Assn., presenting information about present methods and practices which have been found satisfactory; it indicates how and where lightning arresters should be installed at power houses, substations, transmission lines, railway lines, locomotives and car equipment; kinds of grounds and methods of testing.

U. S. Gov., Navy Dept. Specification 41S42a; 1944. Spreaders; Coil, Armature and Stator (Shipboard Use).

References.—Slate insulation, porcelain insulation *see* 511.53, 532.22; copper cable, wire, rods. *see* 715.41, 715.44, 642.11; other safety codes for electrical apparatus, *see* 710.

715.51 Lightning Arresters

American Institute of Electrical Engineers, No.28; 1944. American Standards Assn., C62.1-1944. American Standards for Lightning Arresters for Alternating-Current Power Circuits. Covers scope, service conditions, definitions, classification, rating, performance characteristics, design tests, alternating voltage design tests, impulse design tests, operating duty design tests, routine tests, acceptance tests, other tests, and nameplate data.

American Transit Assn., sponsor. American Standards Assn., C15-1935. Specification for 750-Volt Direct Suspension Overhead Trolley Contact Construction. Includes requirements on lightning arresters.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1942. Minimizing the Effect of Lightning on Track Circuits. Gives relay, transformer, battery, rectifier, grounds, and discharge resistors.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Resistance of Made Grounds. Limits of ground resistance, requires use of approved instrument, and treatment of earth to reduce resistance.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 52-43; 1944. Low Voltage Lightning Arrester. Indoor type of lightning arrester for railway signal service. Covers material and workmanship, general design, base, binding posts, finish, insulation, dielectric requirements, identification, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 60-40; 1941. Installation of Made Ground for Protection Against Abnormal Potentials. Provides for elements of galvanized iron rod, size of copper wire lead, resistance, location, multiple units.

Assn. of American Railroads, Telegraph and Telephone Section, 4-4; 1924. Telegraph and Telephone Office Arresters. Replaceable type to be used with line fuses, requirements for voltage operating characteristics, current carrying capacity, and insulation resistance.

Assn. of American Railroads, Telegraph and Telephone Section, 4-5; 1924. Telegraph and Telephone Cable Arresters. Covers readily replaceable type, design, material and workmanship, electrical and mechanical requirements, marking, and tests.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention 15.65; 1938. Lightning Rods for Factory Stacks. Includes specifications for lightning rod equipments for brick, tile, concrete, and metal stacks.

National Electrical Manufacturers Assn. Lightning Arrester Standards, 44-89; 1944. Gives classification of types, classification of uses, rating standards, service conditions, manufacturing standards, performance standards, testing procedure, methods of test, design tests; lightning arresters—station valve type A-c service; lightning arresters—line valve type A-c service; lightning arresters—distribution valve type A-c service; and definitions.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-128. Lightning Arrestors; Vacuum Type.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H31; 1940. American Standards Assn., C2.1-1941. Safety Rules for the Installation and Maintenance of Electrical Supply Stations. (Comprising Part 1—for equipment of indoor and outdoor supply stations, provided it is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons. They also apply to similar equipment if installed in factories, mercantile establishments, vehicles or elsewhere. Exceptions—if voltage does not exceed 150 volts to ground, and if voltage is not more than 550 volts between conductors and power utilized does not exceed 3,200 volts; and the grounding rules of the Fifth Edition, National Electrical Safety Code.) For lightning arrestors (sec. 18), requirements on location, provision for disconnecting, connecting wires, grounding frames, and guarding live and arcing parts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H32; 1941. American Standards Assn., C2.2-1941. Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines. Comprising Part 2 of the Fifth Edition, National Electrical Safety Code. Includes lightning protection wires for open supply conductors.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H33; 1940. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment (Comprising Part 3 and the Grounding Rules of the Fifth Edition, National Electrical Safety Code). These rules apply to the grounding of all lightning arrestors except those on communication circuits, and of all circuits, equipment, or wire raceways when the grounding is intended to be a permanent and effective protective measure. They do not apply to the grounded return of electric railways, nor to the grounding of lightning protection wires which are independent of electric circuits or equipment. These rules do not require that grounding shall be done, but cover the methods for protective grounding. The rules requiring grounding are included under the various parts of this code.

U. S. Gov., U. S. Army, Signal Corps. Specification 46-1A; 1941. Protector; Type AR-8, Sound and Flash Ranging.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-67-D; 1941. Protector AF-6, for Substation Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-288A; 1924. Rod; Ground, Types GP-11, GP-16, and GP-24, Telephone.

References.—Lightning codes, lightning rod protection, *see* 715.50; definitions, symbols, standard voltages, methods of test, safety codes, *see* 710.

716. ELECTRIC LAMPS AND LIGHTING EQUIPMENT

716.0 GENERAL ITEMS

American Lighting Equipment Assn., Inc. Specification for Residential Luminaires Incorporating I.E.S. Recommended Practice for the Illumination Performance of Residential Luminaires, 1941. Includes definitions of types of luminaires, illumination and brightness requirements of each type, and safety and construction requirements.

American Transit Assn. Recommended Specification for Definitions of Illumination Terms, E147-39; 1939. Provides explanations of the more commonly used terms in the illumination field.

716.1 ELECTRIC LAMPS

716.10 General Items

American Medical Assn. Council on Physical Therapy. Acceptance of Sunlamps, 1940. Utilizes the erythemal reaction as a basis of judging the effectiveness of ultraviolet ray sunlamps and includes requirements for acceptance of sunlamps and regulations to control advertising of sunlamps sold to the public.

American Medical Assn. Council on Physical Therapy. Acceptance of Ultraviolet Lamps for Disinfecting Purposes, 1942. Includes physical data on germicidal lamps and tentative requirements for acceptance of ultraviolet lamps for disinfecting air.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Electric Lamps. Instructions for replacement, cleaning, contact, voltage, and testing, also a table of life hours.

716.11 Ordinary Incandescent Lamps

American Transit Assn. Recommended Specification for Large Incandescent Lamps, E144-38; 1938. All lamps covered by this specification are large regular tungsten-filament electric incandescent lamps. (See definitions d and h, paragraph 107 for "large" and "regular.") Specification sets forth general requirements for lamp marking, test procedure, physical inspection test, initial rating test, life performance test, and rejection of lamps.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1943 lamps. Includes table of recommendations for standard incandescent lamps for cab and headlight used in lighting locomotives.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 51-43; 1944. Incandescent Electric Lamps. Covers lamps for railway signal lighting. Covers material and workmanship, definition and standards, bulb and stem, base, filament, leading-in wires, identification, inspection, tests, samples for test, acceptance requirements, packing, and marking.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Incandescent lamps. Limit of ratings for medium and mogul bases; protection requirements of gas filled lamps in show windows.

U. S. Gov., Federal Specification W-L-101e; 1942. Supplement, 1943. Amendment 2; 1944. Lamps; Electric, Incandescent, Large, Tungsten-Filament. Manufacturer is given widest range in selection of materials and processes of manufacture in order that lamps of maximum quality may be produced. Shall meet manufacturers' standard shapes, sizes, and finishes of bulbs, forms of filament and types of leading-in wires and bases on file at the National Bureau of Standards. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification W-L-111B; 1937. Lamps; Electric, Incandescent, Miniature, Tungsten-Filament. "Miniature" lamps designate broadly lamps for automotive, flashlight, and similar types of service. Manufacturer is given widest range in selection of materials and processes of manufacture in order that lamps of maximum quality may be produced. Shall be so designed and made that they will meet manufacturers' standard on file at the National Bureau of Standards. Gives detail requirements for life to burn out, manufacturer's declared efficiency, and candle power maintenance; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.231. Portable Desk Lamps; Types Nos. 1, 2, 2D, 3, and 4. Gives requirements for casings, fixtures, reflectors, and plugs. No incandescent lamps to be furnished.

U. S. Gov., Treasury Dept., Procurement Div., 246C, 1942. Lamps; Desk, Incandescent. Shall be of five types. Gives requirements for lamp socket, switch, insulating bushings and wireways, wire connections, cord, cap or plug, exposed edges, stability, ventilation, finish, dimensions, base, columns, reflector, shade, and illumination; methods of sampling, inspection, and tests; and packaging and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-420; 1927. Lamp; Type LM-4, Miniature, 2.2-Volt.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1014; 1942. Lamp LM-22.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1398; 1942. Lamp LM-51 and LM-60.

References.—Illumination, nomenclature, lamp testing methods, *see* 716.0; standard thread and screw base sizes, railway sizes and types, *see* 716.10; definitions, symbols, standard voltages, safety codes, *see* 710; dial lamps for radio receivers, *see* 716.14.

716.12 Lamps for Automobiles and Motor Boats

American Automobile Assn. Headlight Testing Manual. To aid garages and inspection stations in servicing lighting systems so as to produce the safest illumination possible and in determining when rejections and replacements of parts are necessary for the protection of highway users. Covers space requirements, mounting the chart, adjusting height of chart, locating the car, preliminary inspections, and headlight beam arrangements and patterns.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Electric Lamp Bulbs and Bases, revised 1944. Includes lamp sizes and ratings for bulb types, filament types, and prefocused types; lamp base dimensions, sealed beam headlamp units; sizes, ratings, and types; and electric light bulbs and sealed lighting units for military vehicles.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Recommended Practice for Direction Signal Lamps, Clearance, Side-Marker, and Identification Lamps, Reflex Reflectors, and Electric Emergency Lanterns, revised 1942. Gives definition, samples for test, laboratory facilities, vibration test, moisture test, dust test, corrosion test, color test, and photometric test.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Recommended Practice for Electric Supplementary Driving Lamps, adopted 1941. Gives definition, samples for test, laboratory facilities, vibration test, moisture test, dust test, corrosion test, photometric test, and out of focus tests on unsealed units.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Recommended Practice for Electric Supplementary Passing Lamps, adopted 1942. Gives aiming and usage, definition, laboratory facilities, vibration test, moisture test, dust test, corrosion test, and photometric test.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Recommended Practice for Headlamp Mountings, adopted 1936. Requirements for beam adjustments and stability of same.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Recommended Practice for Headlighting Inspection Code, revised 1942. Definitions of beams, general headlamp testing requirements (diagram of car with respect to screen), general lamp inspection limits, and lamp output; focus and aim inspections.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Recommended Practice for Headlight Switching, adopted 1934. Gives recommendations for driving beam and for beam used for passing other cars.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Recommended Practice for Sealed Beam Headlamp Units for Motor Vehicles, adopted 1940. Gives application, scope, definitions, samples for test, laboratory facilities, photometric test, maximum beam intensity, country or upper beam, and traffic or lower beam.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Standard for Adverse Weather Lamps, Tail Lamps, Stop Lamps, and License Plate Lamps, revised 1942. Gives definition, samples for test, laboratory facilities, vibration test, moisture test, dust test, corrosion test, and color test.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Standard for Color Specification for Electric Lamps, adopted 1942. Gives scope, trichromatic coefficient specification, and visual comparison of colors.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Standard Electric Headlamps for Motor Vehicles, revised 1937.

Laboratory tests for minimum optical requirements and tests.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Standard for Lighting Equipment for Motor Vehicles, adopted 1942. Gives scope, samples for test, laboratory facilities, vibration test, moisture test, dust test, corrosion test, and color test.

Underwriters' Laboratories, Inc. Standard for Clearance, Marker, and Identification Lamps for Motor Vehicles, 1940. Gives requirements for form and standards for color determination, design and construction, tests for vibration and shock, moisture and dust resistance, corrosion, photometric test of candlepower, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS80-41; 1941. Electric Direction Signal Systems Other Than Semaphore Type for Commercial and Other Vehicles Subject to Special Motor-Vehicle Laws (After Market). This standard covers the requirements and methods for construction, vibration and shock, dust, moisture, corrosion, reliability, and understandability tests for direction signals. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS81-41; 1941. Adverse-Weather Lamps for Vehicles (After Market). This standard covers the requirements and methods for construction, vibration and shock, dust, moisture, corrosion, and photometric tests of adverse-weather lamps. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS82-41; 1941. Inner-Controlled Spotlamps for Vehicles (After Market). This standard covers the requirements and methods for construction, vibration and shock, moisture, dust, corrosion, and photometric tests of inner-controlled spotlamps. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS83-41; 1941. Clearance, Marker, and Identification Lamps for Vehicles (After Market). This standard covers the requirements and methods for construction, vibration and shock, dust, moisture, corrosion, and photometric tests of clearance, marker, and identification lamps. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS84-41; 1941. Electric Tail Lamps for Vehicles (After Market). This standard covers the requirements and methods for construction, vibration and shock, dust, moisture, corrosion, and photometric tests of electric tail lamps. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS85-41; 1941. Electric License-Plate Lamps for Vehicles (After Market). This standard covers the requirements and methods for construction, vibration and shock, dust, moisture, corrosion, and photometric tests of electric license-plate lamps. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS86-41; 1941. Electric Stop Lamps for Vehicles (After Market). This standard covers the requirements and methods for construction, vibration and shock, dust, moisture, corrosion, and photometric tests of electric stop lamps. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS97-42; 1942. Electric Supplementary Driving and Passing Lamps for Vehicles (After Market). To establish standard specifications and methods of test for supplementary driving and passing lamps (after market) for the guidance of manufacturers, distributors, and users. Covers definitions, general requirements, installation instructions, lamp bulbs, samples for test, laboratory facilities, vibration and shock test, moisture test, dust test, corrosion test, photometric test, marking, and labeling.

U. S. Gov., Federal Specification W-L-111B; 1937. Lamps; Electric, Incandescent, Miniature, Tungsten-Filament. "Miniature" lamps designate broadly lamps for automotive, flashlight, and similar types of service. Manufacturer is given widest range in selection of materials and processes of manufacture in order that lamps of maximum quality may be produced. Shall be so designed and made that they will meet manufacturers' standard on file at the National Bureau of Standards. Gives detail requirements for life to burn out, manufacturer's declared efficiency, and candle power maintenance; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Lamps; Stop and Tail Lights.

References.—Illumination, nomenclature, lamp testing methods, *see* 716.0; standard thread and base for screw base lamps, *see* 716.10.

716.13 Electric Hand Lamps and Lanterns

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 142. Flashlight.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 224. Lantern; Electric, Heavy-Duty Battery.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R68-33; 1933. Metal and Fiber Flashlight Cases. This recommendation establishes a simplified list of stock types, sizes, and finishes of metal and fiber flashlight cases.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS87-41; 1941. Red Electric Warning Lanterns. This standard covers the requirements and methods for construction, vibration and shock, weatherproof, dust, reliability and life, and photometric tests of red electric warning lanterns. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Federal Specification W-F-421a; 1940. Amendment 2; 1944. Flashlights; Electric, Hand (Without Batteries). Covers two types—(I) with seamless steel cases or continuous-welded steel cases in eleven styles; and (II) with rigid cases having a nonconducting exterior surface, in six styles. Gives requirements for location of bulb in focusing, reflectors, lenses, switches, body tube, exterior finish, lamp holder, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification W-L-111B; 1937. Lamps; Electric, Incandescent, Miniature, Tungsten-Filament. "Miniature" lamps designate broadly lamps for automotive, flashlight, and similar types of service. Manufacturer is given widest range in selection of materials and processes of manufacture in order that lamps of maximum quality may be produced. Shall be so designed and made that they will meet manufacturers' standard on file at the National Bureau of Standards. Gives detail requirements for life to burn out, manufacturer's declared efficiency, and candle power maintenance; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 17F7b; 1934. Flash-Lights; Electric, Hand.

U. S. Gov., Navy Dept. Specification 17L11a; 1944. Lanterns; Electric, Automatic, Floating.

U. S. Gov., Navy Dept. Specification 17L14a; 1944. Lanterns; Electric, Portable, Hand or Head.

U. S. Gov., Navy Dept. Specification 17L17c; 1945. Lanterns; Flood, Storage-Battery, Portable.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32286-A; 1944. Lamp Assembly; Flashlight, Type A-5A (Inspection).

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32413-A; 1944. Lamp Assembly; Flashlight, Type A-8.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-94; 1941. Lantern; Electric, Commercial Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1599; 1943. Flashlight TL-194.

U. S. Gov., U. S. Maritime Commission. Specification 17-MC-7a; 1945. Flashlights; Electric. Covers one grade and two types—(I) general purpose, and (II) explosion-proof. Gives requirements for sizes, materials, workmanship, cells, lamps, reflector, lens, switch, case, lamp holder, threads, finish, dimensional stability, watertightness, corrosion resistance, ruggedness, blackout filters, and details; sampling, inspection, and methods of test; packaging, packing, and marking for shipment.

References.—Miner's lamps, *see* 716,17; illumination nomenclature, lamp-testing methods, *see* 716.0; standard thread and base for screw base lamps, *see* 716.10; flash-light batteries, *see* 712.1; dial lamp for radio receivers, *see* 716.14

716.14 Dial Illuminating Lamps

Radio Manufacturers Assn. Panel Lamps M4-131 to M4-136, M4-141, and M4-142; 1936. Gives form, dimensions, and ratings for six standard sizes of dial lamps, miniature screw base and miniature bayonet base dimensions, and detail of screw base thread standards.

References.—Illumination nomenclature, lamp testing methods, *see* 716.0; standard thread and base for screw base lamps, *see* 716.10.

716.15 Mercury Vapor Lamps

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Mercury Vapor Lamps. Requirements for grounding, overload protection, and enclosures for resistances and regulators.

U. S. Gov., Veterans Administration. Specification VA-X-182b; 1939. Quartz Mercury Vapor Arc Lamps.

716.16 Arc Lamps

American Society for Testing Materials, E 42-42 T; 1942. Tentative Recommended Practice for Characteristics of Standard Carbon Arc Accelerated Weathering Unit. The characteristics recommended cover those points of fundamental importance that will provide an acceptable accelerated weathering unit for many purposes, and at the same time permit the development of detailed and specific cycles needed for the obtaining of particular data and falling within the general structure of this recommended practice.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Arc Lamps. Enclosure, Clearance and mounting requirements of parts, requirements on leads, overload protection, and operating switch.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-62; 1940. Lamp Assembly; Photographic, Type B-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-128; 1941. Lamp Assembly; Photographic, Type B-3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-129; 1941. Lamp Assembly; Photographic, Type C-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-191; 1942. Lamp Assembly; Photographic, Type B-4.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-291; 1943. Lamp Assembly; Photographic, Type B-5.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2872; 1939. Lamp; Therapeutic, Carbon Arc.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2891; 1939. Lamp; Therapeutic, Mercury Arc, Water-Cooled, and Applicators.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2941; 1939. Lamp; Therapeutic, Mercury Arc, Air-cooled, and Burner.

References.—Illumination nomenclature, *see* 716.0; definitions, symbols, methods of test, electric service standards, safety codes, *see* 710; arc projectors and searchlights, *see* 716.2.

716.17 Miner's Lamps and Gas Detectors

References.—Illumination nomenclature, lamp testing methods, *see* 716.0; standard thread and screw base sizes, *see* 716.10; flame type miners lamp, *see* 997.6.

716.18 Fluorescent Lamos

Fluorescent Lighting Assn. Cold-Cathode Fluorescent Lighting Specifications, 1943. A set of tentative specifications covering the essential details of an installation that has actually been made and is now operating satisfactorily. Covers general conditions, color of tubing, diameter of tubing, length of tubing, electrode housings, transformers, transformer boxes, installation, performance, and standard specifications for cold-cathode fluorescent tubing.

Fluorescent Lighting Assn. Cold Cathode Lamp Type Designations, 1942. Covers three classes for standard tubes. Class "A" for tubes which are straight with electrodes sealed on the ends; class "B" for tubes which are straight, except for the electrodes which are bent at right angles; and class "C" designates curved tubes.

Fluorescent Lighting Assn. Revised Length Standards for Finished Straight-Length Lamps, 1944. Gives length of lighted tubing in inches—48, 72, 80, 89, 112, and 136; allowing 4 in. for electrodes making over all length of finished lamps 4 in. more than lighted tubing portion.

Fluorescent Lighting Assn. Three Cold-Cathode Fluorescent "White" Color Standards, 1942. F.L.A. "soft white" is a definitely warmer white with slight pinkish cast for restaurants, food shops, cafes, beauty parlors, retail shops, and other establishments requiring "cozy" illumination. F.L.A. "3,500 white" is a pleasing white light source without the yellowish cast. F.L.A. "daylight" provides illumination of the order of that from a north skylight.

U. S. Gov., Army Air Forces. Specification No.32451; 1944. Lamp Assembly; Cockpit, Type C-8, Ultra-Violet, 28 Volt., Direct Current.

U. S. Gov., Army Air Forces. Specification No.32484; 1944. Lamp Assembly; Cockpit, Type A-9, Ultra-Violet.

U. S. Gov., Federal Specification W-L-131; 1942. Supplement, 1942. Amendment 1; 1942 to 1942 Supplement. Lamp Auxiliaries; Fluorescent. Covers two types—(I) single-lamp ballasts for operation of single lamps, and (II) two-lamp ballasts for operation of two lamps. Gives requirements for power factors, frequencies, materials, workmanship, marking, and temperature rise; wattage, wave shape, voltage range for starting, starting time, preheating, supplementary cathode heating, noise, and radio interference; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.514; 1941. Lamps; Desk, Fluorescent. Shall be of the type designed to direct almost all light downward. Covers two designs—(I) with shield or screen between lamp and work area, and (II) without shield or screen between lamp and work area; and two classes—(A) pedestal type, and (B) swinging arm type. Current shall be either a.c. or d.c. Gives requirements for illumination, reflecting surface, housing, cord, attachments, switch, socket, and auxiliaries; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.570; 1942. Lamps; Electric, Fluorescent. Gives requirements for types, sizes, colors, life to failure, initial lumens per watt, lumens per watt maintenance, dimensions, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

716.19 Miscellaneous Lamps

American Standards Assn., Z52-43; 1944. Photographic Flash Lamps (American War Standard). Gives types, classes, material and workmanship, general requirements, shapes and dimensions, luminous flux vs. time characteristics, and spectral energy distribution; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1940. Electric Marker Lamps. Plug is lightweight and will withstand severe usage. The receptacle can be applied to practically any junction box now in service. Both plug and receptacle are arranged in three contacts, which permits of connecting to a special marker light circuit, the third connection being available for connection to the lamp regulator. Gives figures showing plug, receptacle, and typical connection diagrams for wiring.

Illuminating Engineering Society. Specifications for I.E.S. Portable Lamps, 1941. Covers requirements for effectiveness, safety, construction, 100-watt study and reading lamp, end-table lamp, semi-indirect floor lamp, indirect floor lamp, and I.E.S. better-sight lamp specifications summary.

U. S. Gov., Army Air Forces. Specification No.32514; 1944. Flasher; Lamp Assembly, Type B-1, Periodic.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-28; 1944. Lamps; Red Coated Miniature, Incandescent.

U. S. Gov., Navy Dept. Specification 17L13; 1944. Lamps; Diving, Navy-Standard.

U. S. Gov., Navy Dept. Specification 17L15a; 1944. Lights; Electric, Signaling, Portable, Multi-Purpose (Shipboard Use).

U. S. Gov., Navy Dept. Specification 17L16; 1944. Lights; Electric, Attachable, Small.

U. S. Gov., Navy Dept. Specification 17L19; 1944. Lamps; Negative-Glow.

U. S. Gov., Navy Dept. Specification 57L10; 1943. Lamps; Antral.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2424B; 1941. Lamp; Operating, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2449A; 1941. Lamp; Operating, Portable.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2823; 1939. Lamp; Blue, Green, Ruby.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2824A; 1942. Light; Safe.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2909A; 1942. Lamp; Therapeutic, Infra-Red.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-583C; 1933. Lamp; Types LM-20 and LM-21, Quick Nigrescent.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-984; 1941. Signal Lamp, Type M-132; and Lamp Mounting, Type FT-159.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-10; 1923. Lamp, Ruby, No.0; Lamp, Kodak, Safelight, Complete With Series 0 Safelight.

U. S. Gov., Veterans Administration. Specification VA-DM-100; 1939. Dental Operating Light (for Mounting on Dental Operating Unit).

716.2 SEARCHLIGHTS, PROJECTORS, LOCOMOTIVE HEADLIGHTS, AND REFLECTORS

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No.45; 1940. Addenda, 1942. Emergency

Modification and Supplement, 1943. Searchlights. Includes incandescent and arc types, recommendations on reflectors of parabolic or mangin type, angle of rotation, location, corrosion resistance, mounting and operating gear.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1941. Headlight Reflectors. For locomotives, gives dimensions, diagrams, and refraction for metal and glass-covered reflectors.

Illuminating Engineering Society. Specifications for Testing Lighting Equipment. Specification F-2-1941. Incandescent Filament Floodlights. Includes results to be reported, photometric data, and tables of constants for the conversion of candles into lumens..

Illuminating Engineering Society. Testing Specifications for Lighting Equipment. Section II—Testing Procedure for Narrow Beam Inclosed Projectors. Includes instructions for description of the floodlight, description of the lamp, procedure for making observations, computation of results, essential results to be reported, necessary constants for computation, and sample report sheet.

U. S. Gov., Army Air Forces. Specification No.32429; 1944. Lamp Assembly; Runway and Approach, Type D-1 (High Intensity).

U. S. Gov., Army Air Forces. Specification No.32477; 1944. Lamp Assembly; Beacon, Type F-1 (Code Flashing).

U. S. Gov., Army Air Forces. Specification 32515-1; 1944. Lamp Assembly; Beacon, Type G-1, Obstacle or Code.

U. S. Gov., Army Air Forces. Specification No.40886; 1944. Reflector; Taxi-Strip and Runway, Type B-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-4; 1942. Lamp Assembly; 24-Inch Rigid Drum Type Rotating Beacon.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-5a-1; 1944. Lamp Assembly; 24-Inch Drum Type Floodlight.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-6a; 1945. Lamp Assembly; Fresnel Single Unit Portable Floodlight.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-7a-1; 1944. Lamp Assembly; Fresnel Four Unit Stationary Floodlight.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-8a-1; 1943. Lamp Assembly; Fresnel Six Unit Mobile Floodlight.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-9; 1942. Lamp Assembly; Runway Marker.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-10; 1942. Lamp Assembly; Boundary and Obstruction Marker.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-17; 1943. Lamp Assembly; Four Unit Mobile Floodlight.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-19; 1942. Lamp Assembly; Hangar Incandescent Portable Floodlight.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-20; 1942. Lamp Assembly; Hangar Fluorescent Portable Floodlight.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-25a; 1943. Lamps; All-Glass Sealed Reflector.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-26; 1944. Lamp Assembly; Runway Marker (for Snow Areas).

U. S. Gov., Army-Navy Aeronautical Specification AN-T-5a; 1943. Truck; Six Floodlight Field Lighting.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-39; 1943. Truck; Four Floodlight Field Lighting.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-178. Headlight; Electric.

U. S. Gov., Navy Dept. Specification 17D3b; 1936. Door-Glasses; Dome, Searchlight.

U. S. Gov., Navy Dept. Specification 17F12a; 1944. Floodlights; Incandescent (Shipboard Use).

U. S. Gov., Navy Dept. Specification 17M3e; 1945. Mirrors (Reflectors); Searchlight, Glass, Plate, Parabolic.

U. S. Gov., Navy Dept. Specification 17S14b; 1944. Spotlights; Incandescent, Power-Boat.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40091; 1934. Lamp Assembly; Floodlight, Type A-9-B.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 84-47; 1943. Reflector; Lamp, Nonmetallic, 8-Inch Diameter, Conical Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-320; 1924. Signal Lamp Equipment, Type EE-6, EE-7; and Set SE-1 (Formerly 14 Cm. and 24 Cm. Projectors).

U. S. Gov., U. S. Maritime Commission. Specification 17-MC-1a. Amendment 1; 1943. Searchlight; 12-Inch Signaling. Of the lightweight incandescent lamp type for signaling purposes on surface vessels. Gives requirements for material, workmanship, interchangeability, weathertightness, weight, shock, beam characteristic, drum and mounting assembly, reflector, signaling shutter, front glass, socket, cable and plug, insulation resistance, dielectric strength, threaded parts, painting, name plate, instruction book, and spare parts; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 17-MC-2; 1941. Amended, 1943. Reflector; Cargo. Of the wireless cluster type in one size and one grade. Gives requirements for materials, corrosion-resistant materials, corrosion-resistant treatments, enamel, workmanship, reflector, guard, socket, insulating base, cable, inspection, and tests, with drawing.

U. S. Gov., Veterans Administration. Specification VA-M-179; 1936. Searchlights.

References.—Motion-picture projectors, *see* 912.

716.3 LIGHTING REQUIREMENTS AND EQUIPMENT

716.30 General Items

American Standards Assn., A 85-1942. Protective Lighting for Industrial Properties (American War Standard). Intended as a guide for outdoor protective lighting to those whose responsibility it is to provide for plant protection from theft and sabotage. Covers definitions, specifications, lighting equipment, electrical distribution and control, typical methods of obtaining specified illumination values, and tables and figures covering details.

American Transit Assn. Recommended Practice for Shop, Office, and Yard Lighting, E122-39; 1939. Properties of multiple and arc resisting series incandescent lamps, of reflectors and lighting units, recommendations on type of lighting and the minimum intensity for the different standards in shop, office, and yard.

American Transit Assn. Recommended Practice for Trolley Bus Lighting, E131-38; 1938. In general, the interior lighting requirements of a trolley bus are identical with those of the electric railway car or the motor bus. Therefore, details pertaining to recommended values, types of fixtures, and locations of them may be found in Recommended Practices of A.T.E.A., E121 and E123.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. Floodlighting Railroad Yards (10-a-39). Describes two systems of floodlighting generally used, gives requirements for tower connections in classification yards, characteristics of floodlight projectors, illumination intensities, design procedure, and projector characteristics (mechanical).

Illuminating Engineering Society. American Standards Assn., A-11-1942. American Recommended Practice of Industrial Lighting. Covers advantages of good illumination, light and safety, factors of good illumination, maintenance of good illumination, natural lighting, artificial lighting, adequate electrical wiring, and rewiring.

Illuminating Engineering Society. American Standards Assn., Z7.1-1942. Illuminating Engineering Nomenclature and Photometric Standards. Includes photometric quantities, radiation, evaluation of ultraviolet radiation, color, illuminants, materials, and accessories modifying distribution of light, classes, and characteristics of illumination, photometric standards and tests, aeronautic lighting, units, symbols, abbreviations, equivalents, and conversion factors.

Illuminating Engineering Society and the American Institute of Architects, sponsors. American Standards Assn., A23-1938. American Recommended Practice of School Lighting. Recommended amount of illumination for rooms and areas of various occupancy, factors affecting lighting and seeing such as glare, diffusion, color quality of light, finish of ceilings and walls, dirt, dust, furniture, etc.; natural lighting; types of artificial lighting, selection of equipment, layout, automatic photo-electric control, blackboards, classrooms, corridors, dormitory and study rooms, special types of rooms, swimming pools, athletics; wiring capacity provisions and economical operation.

Illuminating Engineering Society. Code of Highway Lighting, 1936. Includes definitions of terms, classification of highways, recommendations for visibility and placement of light sources, prescription for highway lighting, and recommendations for highway lighting.

Illuminating Engineering Society. Recommendations for a Standard Method for Measuring and Reporting Illumination From Artificial Sources in Building Interiors, 1943. Covers general instructions for making reliable illumination measurements and instructions for determining average horizontal foot candles in a regular area.

Illuminating Engineering Society. Recommended Practice for the Illumination Performance of Residential Luminaires, 1941. Covers general requirements, types of luminaires, illumination requirements, and table showing illumination and brightness requirements.

Illuminating Engineering Society. Recommended Practice for Office Lighting, 1942. Covers introduction; lighting and seeing—vision in the office, improvement of the work for better seeing, and quantity of light; factors which affect lighting and seeing—glare and its effects, direction, diffusion and distribution of light, color quality of light, and light reflection value and finish of ceilings and walls; natural lighting of offices—factors affecting natural lighting and automatic photo-electric control of the artificial lighting system; artificial lighting—types of general lighting systems, classification of lighting systems, and maintenance; recommendations for office lighting—general offices, supplementary lighting, office machines, private offices, files, mail room, conference rooms, reception rooms, drafting rooms, corridors, passageways, stairways, and personal service; wiring—adequate wiring, future load trends, and main features of a wiring system.

Illuminating Engineering Society. Recommended Practice for Street Lighting, 1940. Covers visibility for traffic safety—methods of discernment, lighting for night traffic safety, and lighting to safeguard pedestrians; lighting fundamentals—characteristics of illumination, luminaire mounting height and spacing, transverse location of luminaires, glare, appearance, and operation; street pavements, lighting recommendations—classification of streets, illustrative arrangements, business, residential, and industrial streets, intersections, boulevards, parks, alleys, bridges, viaduct, plazas, traffic circles, express roadways, underpasses, and tunnels; measurement and calculation of illumination; and relation between street lighting and motor vehicle lighting.

Illuminating Engineering Society. Researches on Industrial Lighting—Lighting for the Machining of Small Metal Parts, 1939. Covers introduction, fundamental seeing task, procedure of study, design procedure, portable measuring instruments, bench work, machine tools, inspection of polished surfaces, and appendix.

Illuminating Engineering Society. Researches on Industrial Lighting—Lighting for Silk and Rayon Throwing and Wide Goods Weaving, 1938. Covers general nature of problem and method of approach, the manufacturing processes and their lighting requirements, the throwing plant, the weaving plant, summary of lighting recommendations, and glossary of weaving terms.

Illuminating Engineering Society. Researches on Industrial Lighting—Progress Report on Lighting in the Printing Industry, 1936. Covers lighting for work on type, lighting of press operations, lighting of off-set printing, lighting for intaglio or photogravure processes, lighting for work on copy, lighting for binding, and the economics of good lighting.

Illuminating Engineering Society. Researches on Industrial Lighting—Report on Lighting in the Candy Manufacturing Industry, 1937. Covers relationship of lighting to the industry, chocolate making, chocolate dipping, cream making, kiss making and wrapping, gum drops and jellied forms, hard candy manufacturing, sorting and packing, assorted packing, special holiday mold candy, box making and scoring, special box making, and illumination table.

Illuminating Engineering Society. Researches on Industrial Lighting—Report on Lighting in the Shoe Manufacturing Industry, 1937. Covers sole leather department, upper department, stitching department, making department, finishing department, packing and shipping, and rubber shoes department.

Illuminating Engineering Society. Researches on Industrial Lighting—Report on Lighting in the Textile Industry, Grey Goods and Denim, 1937. Covers determination of the seeing problem, recommended levels of illumination, discussion and recommendations, lighting economics in the grey goods mill—weave shed, seeing problems and levels of illumination, weave shed, and other areas.

Illuminating Engineering Society. Researches on Industrial Lighting—Studies in Lighting of Intricate Production, Assembly and Inspection Processes, 1937. Covers production laboratory of radio plant, tool design, tool making, punch press, machine shop, sheet metal fabrication, wax engraving, photo engraving, line assembly of radio sets, radio cabinet assembly, inspection of radio chassis, and radio cabinet assembly.

Illuminating Engineering Society. Researches on Industrial Lighting—The Lighting of Power Presses, 1939. Covers discussion of seeing problem, shearing, forming and bending, squeezing or coining, material and stock handling, recommendations, economics, die repairing, machine and equipment inspection, and general discussion.

Illuminating Engineering Society. Specifications for Testing Lighting Equipment. Specification C-1-1940. Luminaires for General Lighting. Includes requirements for materials, diffuse enclosing and semi-indirect enclosing globes; direct, indirect, and semidirect luminaires; selection, physical measurements, output, candlepower distribution, brightness, and lamp neck cutoff ratio.

Illuminating Engineering Society. Testing Specifications for Lighting Equipment. Section III—Specifications for Testing Asymmetric Show-Window Reflectors. Includes instructions for selection of sample, physical measurements, output, candlepower distribution, lumen distribution, and gives typical show-window example.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-56-2; 1943. Colors; Aeronautical Lights and Lighting Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-405. Lighting; Installation Specification for Airport.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-506. Airport Lighting for Alaska; Installation Series.

U. S. Gov., Dept. of Labor, Div. of Labor Standards. Special Bulletin 3; 1941. Protecting Plant Manpower. Practical Points on Industrial Sanitation and Hygiene. Covers introduction, fatigue, criteria of industrial health hazards, preventive measures, heating, ventilation, and cooling of work places; personal respiratory protection, personal service conveniences, industrial health program for the small plant, illumination, and noise.

References.—Wiring methods and practice, *see* 715.30.

716.31 Electric Signs

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Signs and Outline Lighting. Minimum thickness of sheet metal, provisions for drainage, weatherproof cabinets, switches, and fuses; types of sockets and receptacles, minimum size and insulation of wire, method of installing wire, capacity of branch circuits, inclosure of live parts, and grounding requirements.

Underwriters' Laboratories, Inc. Standard for Electric Signs, 1940. Covers incandescent-lamp signs, gas-tube signs, and combinations of both, to be employed in accordance with the National Electrical Code. Does not cover outline lighting requiring field assembly. Enclosure, glass panels and letters, wiring, lamp-holders, gas tubing, electrode receptacles, transformers; fuse-holders, panelboards, switches, etc.; clocks; spacings; guarding of live parts and grounding; dielectric strength of accessories; marking; and inspection of listed product.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment. (Comprising Part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators—and the grounding rules of the Fifth Edition, National Electrical Safety Code.) For electric signs (Section 36), requirements on accessibility, inclosure of live parts, grounding of non-current-carrying metal parts, control, and connectors.

References.—Wiring methods and practice, *see* 715.30; safety code for signs, *see* 710; copper wire, electric lamps, *see* 715.44, 716.11; steel sheets, *see* 604.23; transformers, high frequency apparatus, *see* 713.5, 717.3.

716.32 Electric Lighting Fixtures

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Fixtures, Construction of lighting fixtures, wireways, thickness of metal tubing, minimum size of wire, method of wiring, grounding, mounting requirements for various locations.

Underwriters' Laboratories, Inc. Standard for Electric Lighting Fixtures and Portable Lamps, 1941. For use in accordance with the National Electrical Code. General mechanical and electrical construction, show-window and show-case fixtures, vapor-tight fixtures, recessed fixtures, fluorescent-lamp fixtures, stage-type fixtures, portable lamps, and inspection of listed product.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.231. Light; Lookout Map Board.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment. (Comprising Part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators—and the grounding rules of the Fifth Edition, National Electrical Safety Code.) For lighting fixtures (Section 62), requirements on grounding, gas piping as electrode, polarizing lampholders, receptacle for convenience, outlet, exposed live parts, lamps in series circuits, and safe access to arc lamps.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification E-9Ye; 1943. Electrical Apparatus, Distributing Systems, and Wiring (Emergency Edition). Includes requirements for lighting fixtures.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for lighting Fixtures, 1941.

U. S. Gov., Treasury Dept., Procurement Div., 328B; 1941. Reflectors; Metal, Direct Lighting. Shall be of two types—(I) porcelain-enamel reflector and (II) porcelain-enamel reflector and glass globe. Gives requirements for steel or iron, coating, angle of cut-off, dimensions, contour, and efficiency; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 413B; 1942. Lighting-Units; Pit, Vapor-Proof. Covers vapor tight lighting units for use in pit, tunnel, viaduct, and underpass lighting; suitable for built-in or surface installation; two sizes—No. 1, suitable for insertion in 100 and 150 watt lamps; and No. 2, for 200 watt lamps. Gives requirements for box or main housing, cover frame, cover glass, guards, brackets, reflectors, receptacle, water tightness, tapping, installation, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.555; 1942. Fixtures; Lighting, Fluorescent, A.C. (General-Lighting Use). Covers four types—(1) closed-end (continuous mounting), (2) closed-end (individual mounting), (3) open-end (continous mounting), and (4) open-end (individual mounting); two styles—(A) two-lamp and (B) three-lamp; and two classes—(A) vitreous enamel reflectors and (B) organic finish reflectors. Gives requirements for reflectors, dimensions, wiring, lampholders, starting switch and socket, ballast, contour, efficiency, assembly, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.589; 1942. Fixtures, Lighting, Fluorescent, A.C.; Non-Ferrous; 40-Watt Lamps; General Service. Covers three types—(I) concentrated light distribution (multiple-unit type), (II) medium concentrated light distribution, and (III) medium broad light distribution (R.L.M. type). Gives requirements for assembly, nonferrous feature, general construction, efficiency and flux distribution, mounting design, auxiliaries, reflectors, supply line connection, voltage, finish, and rejection; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-270; 1943. Lamp Assembly; Indirect-Light Box.

U. S. Gov., U. S. Army, Medical Dept. Specification 1-35; 1939. Lamp; Desk, Flexible Arm.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-43; 1940. Lamp; Table.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-712; 1937. Lamp Fixture; Type M-142, Portable.

U. S. Gov., Veterans Administration. Specification VA-G-161a; 1939. Floor Lamps.

U. S. Gov., Veterans Administration. Specification VA-G-162a: 1939. Table Lamps.

References.—Wiring methods and practice, *see* 715.30; safety codes, symbols, testing methods, *see* 710; molded insulation, *see* 719.58; sockets and receptacles, *see* 715.21; copper wire, gas fixtures, *see* 715.44, 997.2.

716.39 Miscellaneous Lighting Equipment

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No.45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. (1) Lighting Equipment. Covers location of fixtures, illumination requirements, type of lamp and base, extension outlets, permanent and portable watertight and nonwatertight fixtures, switches, etc. (2) Emergency Light and Power System. Covers capacity and fuel supply of Diesel engine-driven generating sets for cargo and passenger vessels over 1,600 gross tons, storage battery systems for cargo vessels and for passenger vessels of 100 to 1,600 gross tons, circuits to be supplied, automatic controls, etc.

American Transit Assn. Recommended Practice for Car Lighting, E121-39; 1939. Recommends a minimum intensity of illumination, general type of lighting, location of lights in car at entrances and exits, gives characteristics of lamps and reflectors, and drawings of car lighting layouts.

American Transit Assn. Recommended Practice for Motor Coach Lighting, E123-38; 1938. Recommendations of illumination intensity, sizes of lamps for various locations and uses, data on representative lamps and reflectors, typical layouts with given recommended illumination intensities, recommended types and construction for headlights, and rules for adjustment; construction and illumination of signs, types of step lights and stop lights; total recommended wattage requirements for various sizes of motor coaches and sizes of wire.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1940. Electric Train Lighting. Gives general requirements, axle generator mounting and suspensions, clearances, steam and water drips, pulley axles, wiring, and installation of conduit and wire.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended

Practice, 1939. Illumination of Rolling Stock. Recommends 7 to 15 ft. candles in reading locations, elimination of shadows, glare, and dust, for harmony with architectural treatment, direct, semidirect, and indirect lighting for railway day coach lighting, dining car, sleeping car, and parlor or club car.

Illuminating Engineering Society. Specifications for Shades for I.E.S. Portable Lamps, 1935. Applies to shades designed for incorporation in certified I.E.S. table and floor lamps. Includes requirements for effectiveness, construction, and proposed specifications for shades for I.E.S. portable lamps.

Underwriters' Laboratories, Inc. Standard for Christmas-Tree and Decorative-Lighting Outfits, 1941. Covers outfits to be employed on lighting circuits in accordance with the National Electrical Code. General, series-connected units, multiple-connected units, wreaths, candle sets, etc.; packing, instructions, rating, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Electric Lighting Fixtures for Use in Hazardous Locations, Subject 844; 1942. Covers indoor electric lighting fixtures in two classes—(I) locations are those in which flammable volatile liquids, highly flammable gases, mixtures or other highly flammable substances are manufactured, used, handled, or stored in other than their original containers, and (II) locations are those in which combustible dust is thrown, or is likely to be thrown, into suspension in the air in sufficient quantities to produce explosive mixtures, or those where it is impracticable to prevent such combustible dust from collecting in such quantities on or in motors, lamps, or other electrical devices that they are likely to become overheated because normal radiation is prevented. Gives details for class I and for class II and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Fluorescent-Lamp Control Equipment, 1942. Covers reactor-type ballasts, resistor-type ballasts, automatic starting switches, and manual starting switches with or without line switches, for use with tubular fluorescent lamps of the hot-cathode type, to be employed in accordance with the National Electrical Code.

U. S. Gov., Army Air Forces. Specification 32425 (1); 1944. Equipment; Field Lighting (Semi-Permanent).

U. S. Gov., Army Air Forces. Specification No. 32454; 1944. Lamp Assembly; Flashlight, Type A-9 (Hand Energized).

U. S. Gov., Army Air Forces. Specification No. 32465; 1944. Lamp Assembly; Flashlight, Type A-10 (Hand Energized).

U. S. Gov., Army Air Forces. Specification 32470A; 1944. Regulator; Runway Control, Type B-1.

U. S. Gov., Army Air Forces. Specification No. 32487; 1944. Lamp Assembly; Flashlight, Type A-11, Luminous Wand.

U. S. Gov., Army Air Forces. Specification 50284-B (1); 1944. Lamp Assembly; Extension (Vapor-Tight).

U. S. Gov., Army-Navy Aeronautical Specification AN-B-1a; 1942. Bridge Assembly; Floodlight.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-11a; 1944. Light Assemblies; Electrically Retractable Landing.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-12a; 1943. Light Assemblies; Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-14; 1945. Light Assemblies; Work Table.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-22a; 1944. Lamps; Wing Position Light.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-23-1; 1944. Light Assemblies; Ultraviolet—Fluorescent Cockpit.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-3a; 1943. Regulator Assembly; Runway (Remote Intensity Control).

U. S. Gov., Army-Navy Aeronautical Specification AN-R-17; 1944. Regulator Assembly; Brightness Control.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-2-1; 1944. Set; Portable Field Lighting.

U. S. Gov., Navy Dept. Specification 17B15; 1944. Blinkers; Low-Intensity, for Binoculars.

U. S. Gov., Navy Dept. Specification 17L10b; 1944. Lights; Operating, Electric, Shadow-Reducing, Portable (Shipboard Use).

U. S. Gov., Navy Dept. Specification 17L18; 1943. Luminous Material and Equipment (Non-Radioactive); Electric Lamp Activated.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-27172; 1929. Lamp Assembly; Instrument, Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-32410; 1944. Lamp Assembly; Flashlight, Type A-7, Floating Identification.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3012; 1944. Dolly for Field Operating Lamp.

U. S. Gov., Veterans Administration. Specification VA-X-157a; 1938. Illuminator; Radiographic, Triple.

U. S. Gov., Veterans Administration. Specification VA-X-167a; 1938. Illuminator; Radiographic, Single.

References.—Lighting codes, illumination nomenclature, *see* 716.30; electric lamps, *see* 716.1; wiring methods and practice, safety code, *see* 715.30, 710.

717. HOUSEHOLD DEVICES, HEATERS, AND X-RAY APPARATUS

717.0 GENERAL ITEMS

Underwriters' Laboratories, Inc. Bulletin of Research, 27; 1943. Clearances and Insulation of Heating Appliances. This bulletin describes tests conducted to provide definite technical information as a basis for promoting uniformity in the various ordinances, regulations, and standards bearing on the subject. Covers mechanism of heat transfer, test equipment, tests of protective assemblies, temperature measurements, test procedure, test results, and comments.

Underwriters' Laboratories, Inc. Standard for Electric Flatirons and Ironing Machines, 1943. Covers electric flatirons and ironing machines, either with or without automatic temperature control, to be employed in accordance with the National Electrical Code. Definitions, general, frame and enclosure, mechanical assembly, corrosion protection, supply connections, wiring, heating elements, electrical insulation, heat insulation, attachment-plug receptacles, switches, automatic controls, spacings, grounding, motors, performance, rating, marking, and inspection of listed product.

717.1 ELECTRIC HEATING AND COOKING DEVICES

American Hospital Assn., 10-37. Electric Heating Pads.

American Hospital Assn., 19-10. Electric Hot-Plates. Covers two types—(I) light duty, portable; and (II) heavy duty, semiportable.

American Hospital Assn., 40-10. Electric Toasters. Covers two types—two-slice and six-slice.

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No. 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Heating Equipment. For convector and radiant types of electric heaters, recommended voltages and wattages, design details, guards, corrosion protection, resistance elements, temperature limits, thermal cut-out, etc.

National Electrical Manufacturers Assn., and Edison Electric Institute (prepared jointly). Test Specifications for Automatic Electric Storage Water Heaters, NEMA 103; 1940. Describes uniform testing procedure for determination of safety, performance, durability, construction, and convenience minimum requirements. Definitions, marking, capacity, thermostatic control, insulation, wiring, finishes, etc.

National Electrical Manufacturers Assn., and Edison Electric Institute (prepared jointly). Test Specifications for Household Electric Ranges, NEMA 108; 1940. Describes uniform testing procedure, definitions and test conditions for the determination of safety, performance, durability, construction, and convenience. Includes suggested standards for voltage ratings of range elements and for adaptation to supply circuits.

Underwriters' Laboratories, Inc. Standard for Domestic Electric Ranges, 1940. Do not cover portable appliances. Cover general, frame and enclosure, supply connections, wiring, heating elements, electrical insulation, heat insulation, overload protection, current-carrying parts, attachment-plug receptacles, lampholders, outlets for timer controls, switches, automatic controls, spacings, grounding, power input, temperature, dielectric strength, rating, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Electric Flatirons and Ironing Machines, 1943. Covers electric flatirons and ironing machines, either with or without automatic temperature control, to be employed in accordance with the National Electrical Code. Definitions, general, frame and enclosure, mechanical assembly, corrosion protection, supply connections, wiring, heating elements, electrical insulation, heat insulation, attachment-plug receptacles, switches, automatic controls, spacings, grounding, motors, performance, rating, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Electric Heating Appliances, 1940. Covers portable and stationary electric heating appliances to be employed on lighting and power circuits in accordance with the National Electrical Code. General, frame and enclosure, mechanical assembly, corrosion protection, supply connections, wiring, heating elements, electrical insulation, heat insulation, overload protection, fusible links, attachment-plug receptacles, lamp-holders, switches, automatic controls, spacings, grounding, power input, insulation resistance, endurance, dielectric strength, instructions, rating, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Electric Heating Pads, 1942. Covers portable, domestic, electric heating pads to be employed on lighting and appliance branch circuits in accordance with the National Electrical Code. General-use pads, enclosure, closure of openings, heating element, thermostats, flexible cord and fittings, wiring and connections, and performance. Waterproof pads, performance, tests on treated fabric, and tests on assembled pads. Also covers instructions, rating, marking, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Temperature-Indicating and Regulating Equipment, 1942. Covers electrical control equipment for air-conditioning, heating, cooking, and refrigeration, intended to be employed on lighting and power circuits in ordinary locations in accordance with the National Electrical Code. Gives requirements for frame and enclosure, mounting, operating mechanism, corrosion protection, insulating material, supply connections, current-carrying parts, capacities, overcurrent relays, performance, rating, marking, and inspection of listed products.

U. S. Gov., Army Air Forces. Specification 32435-1; 1943. Heater; Oil Immersion, Type C-5.

U. S. Gov., Army Air Forces. Specification 32436-1; 1943. Heater; Oil Immersion, Type C-6.

U. S. Gov., Army Air Forces. Specification 40439-A; 1945. Heater; Oxygen Mask, Electric, Type E-1 (24 Volt D.C., for Type A-14 Mask).

U. S. Gov., Army Air Forces. Specification 40453-A; 1942. Cover; Bombsight, Type A-1, Electrically Heated.

U. S. Gov., Army Air Forces. Specification 40630; 1944. Cover; Bombsight, Type A-2, Electrically Heated.

U. S. Gov., Army Air Forces. Specification 40661; 1943. Container; Food, Type B-1, Electrically Heated, Individual.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-220. Heaters; Space, Electric, Fan Type.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-307. Heaters; Space, Oil-Fired, 50,000 B.T.U.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-388. Heaters; Space, Electric, Convection Type With Separate Control Thermostat.

U. S. Gov., Federal Specification W-H-196; 1942. Heaters; Electric, Water, Storage, Domestic. Covers eight sizes in each of two types—(I) single heating unit and (II) double heating unit. Gives requirements for materials, voltage, name plate, tank, wiring, insulation, heating units, and temperature control; methods of inspection, sampling, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification W-H-636a; 1943. Hot Plates; Electric. Type I, for portable use; type II, for permanent connection; type III, for shipboard use; and various classes, styles, and sizes. Gives requirements for materials, workmanship, voltage, wattage, control, units, body, supporting legs, wiring and connections, finish; methods of sampling, inspection, tests; packaging, packing, and marking.

U. S. Gov., Federal Specification W-P-66; 1941. Pads; Heating, Electric. Covers one grade of a three-heat portable, domestic pad suitable for use on lighting and appliance branch circuits. Gives requirements for instruction, marking, voltage, wattage, size, slip cover, enclosure, waterproofing, heating element, thermostats, fuses; flexible cord and fitting, insulation resistance, heating, flexing, burn-out pull-out, and dielectric strength; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking. Underwriters' Laboratories Standard for Electric Heating-Pads Subject 130, is appliable to and made part of this specification.

U. S. Gov., Federal Specification W-R-101; 1942. Ranges; Electric, Domestic, Cabinet-Type. Electric ranges delivered under this specification shall conform to the standards of the Underwriters' Laboratories as regards fire and casualty hazards. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification W-U-546; 1943. Units; Heating, Electric, Replacement (for Water Heaters, Ranges, and Hot Plates). Type IB, immersion units, embedded-coil type, for electric hot water heaters; sizes—750, 1,000, 1,500 and 3,000 watts. Type IIA, surface units, exposed-coil type, for electric ranges and hot plates; sizes—1,200 and 2,000 watts. Type IIB, surface units, embedded-coil type, for electric ranges and hot plates; sizes—1,200 and 2,000 watts. Type IIIA, oven units, exposed-coil type, for electric ranges; sizes as specified. Gives requirements for voltage, wattage, metallic content limitations, heating elements, dielectric strength, grounding, and details for each type; methods of inspection, sampling, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 17H1e; 1944. Heaters; Electric, Disk-Type.

U. S. Gov., Navy Dept. Specification 17H2f; 1939. Heaters; Electric, Air, Ship Type.

U. S. Gov., Navy Dept. Specification 17H3g; 1944. Heaters; Water, Electric.

U. S. Gov., Navy Dept. Specification 17H4e; 1944. Heaters, Electric, Radiant.

U. S. Gov., Navy Dept. Specification 17-I-7d; 1944. Irons, Flat, Electric.

U. S. Gov., Navy Dept. Specification 17-0-1c; 1944. Ovens; Electric, Industrial, Baking (Armature and Core) (Shipboard Use).

U. S. Gov., Navy Dept. Specification 41P28b; 1943. Pots; Glue, Electric.

U. S. Gov., Navy Dept. Specification 64-0-6a; 1933. Ovens; Electric, Warming.

U. S. Gov., Navy Dept. Specification 65G4; 1937. Griddles, Electric.

U. S. Gov., Navy Dept. Specification 65-0-1a; 1938. Ovens; Electric, Food-Baking, Ships'.

U. S. Gov., Navy Dept. Specification 65-0-2; 1937. Ovens; Roasting, Electric.

U. S. Gov., Navy Dept. Specification 65R2; 1937. Ranges and Cooking-Tops; Electric.

U. S. Gov., Navy Dept. Specification 65T4; 1944. Toaster; Electric, Automatic.

U. S. Gov., Navy Dept. Specification 65U1b; 1945. Urns; Coffee.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Automatic Electric Waterheaters, 1940.

U. S. Gov., Treasury Dept., Procurement Div., 247B; 1942. Heaters; Electric, Reflector. Covers a type of radiant heater suitable for operation with either a.c. or d.c. Gives requirements for heating element, element mounting, heat response, reflector, insulation, handle, wire guard, resistance to corrosion, finish, 600 watt (minimum heater), and 940 watt (minimum) heater; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-242; 1943. Cover; Camera, Electrically Heated, General Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-342; 1943. Cover; Camera, Type B-2 (Electrically Heated—Type K-19 Series Cameras).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-343; 1943. Cover; Camera, Type B-4 (Electrically Heated—Types K-17 and K-17B Cameras With 6-Inch Lens Cone).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-345; 1943. Cover; Camera, Type B-6 (Electrically Heated—Types K-17 and K-17B Cameras With 24-Inch Lens Cones).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-346; 1943. Cover; Camera, Type B-5 (Electrically Heated—Types K-17 and K-17B Cameras With 12-Inch Lens Cones).

U. S. Gov., Veterans Administration. Specification VA-M-204; 1936. Sixteen Slice Electric Toaster (Over Type).

U. S. Gov., Veterans Administration. Specification VA-M-205; 1936. Electric Cooking Tops.

U. S. Gov., Veterans Administration. Specification VA-MC-80f; 1940. Electric Ranges (Four Surface Units).

U. S. Gov., Veterans Administration. Specification VA-MC-198a; 1939. Heavy Duty Electric Range.

U. S. Gov., Veterans Administration. Specification VA-MC-199b; 1940. Automatic Electric Toasters.

U. S. Gov., Veterans Administration. Specification VA-MC-203a; 1939. Continuous Type Electric Toaster.

U. S. Gov., Veterans Administration. Specification VA-MC-206a; 1939. Electric Fry Kettle.

U. S. Gov., Veterans Administration. Specification VA-MM-281d; 1942. Electrically Heated Tray Conveyor With Unheated Compartment.

References.—Resistant heater wire, *see* 715.43; heater cord, *see* 715.42; plugs, connectors, snap switches, *see* 715.21, 717.0, 715.22; insulated wire, *see* 715.44; wiring for heaters, *see* 717.0; steel sheets, *see* 604.22, 604.23; zinc and nickel plating, *see* 600.3.

717.2 MOTOR-DRIVEN HOUSEHOLD DEVICES

American Hospital Assn., 40-1. Meat Chopping (Grinding) Machines. Covers hand-operated and motor-operated. Based on U. S. Gov. Federal Specification 00-M-18 for Meat Chopping (Grinding) Machines.

National Electrical Manufacturers Assn. Household Electric Refrigerator Standards, 42-79; 1942. Provides a uniform method of determining the food storage volume and shelf area and a uniform procedure for determining the performance of mechanically operated household refrigerators. Gives inside dimensions, food storage volume, shelf area, and data to be reported; and test conditions, internal cabinet temperatures, no-load tests, and ice-making test.

U. S. Gov., Dept. of Interior, Purchasing Office, Standard Specification No. 39. Vegetable Peeling Machines.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 82. Slicing Machines; Bread, Electric.

U. S. Gov., Federal Specification W-C-421a; 1940. Amendment 1; 1944. Cleaners; Vacuum, Electric, Portable. Covers two types in various classes and sizes. Type I, enclosed separator, suction only; and type II, exposed separator. Gives requirements for material, marking, exposed surfaces, stability, dirt separation, reversibility, nozzles, agitators, vacuum producer or fan, motor, brushes, motor starter or switch, cord, dust bag, attachments, and detail requirements for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification 00-M-18a; 1944. Machines; Chopping (Grinding), Meat. Covers two types—(I) hand operated, and (II) motor operated; in two classes—(A) intermittant duty, and (B) continuous duty; and various sizes for type I and type II, classes A and B. Type II shall be furnished with or without pedestals. Gives requirements for condition, design, operation, chopper body, feed worm, knives, end plates, thrust bearing, accessibility, finish, marking, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification 00-M-31b; 1943. Machines, Dishwashing; and Dishbaskets. Covers three spray types suitable for washing dishes in the baskets—(A) single tank; (B) double tank, motor propelled; and (C) double tank, manually propelled. Gives requirements for design, material, workmanship, finish, operation, and details of machines and baskets; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 61M6; 1930. Machines; Meat, Bone, and Fish Cutting, Electrically Operated.

U. S. Gov., Navy Dept. Specification 66M4d; 1944. Machines; Vegetable-Peeling, Electrically Operated.

U. S. Gov., Navy Dept. Specification 66M11; 1940. Machines; Powdered-Milk-Mixing, Electrically Operated (Shipboard Use).

U. S. Gov., Treasury Dept., Procurement Div., 220c; 1940. Machines; Floor, Cleaning and Finishing, Cylindrical Type. Shall be of two sizes—1/2 horsepower and 3/4 horsepower. Gives requirements for construction and operation, carriage, drum, switch and wiring, vacuum system, handle, motor protective device, lubrication, finish, brushes, steel wool rolls, sanding accessory, motor, weight, and guarantee.

U. S. Gov., Treasury Dept., Procurement Div., 466A; 1942. Mixers; Food, Electric, Domestic-Type. All mixers shall comply with Underwriters' Laboratories standards in effect. Gives requirements for motor, switch, radio interference, beater speeds, drives lubrication, base, cord with plug, beaters, and attachments; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-14A; 1939. Mixer; Food, Electric.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-68; 1939. Freezer; Ice Cream, Electric.

U. S. Gov., Veterans Administration. Specification VA-M-91a; 1936. Vacuum Cleaners; Electric, Portable.

U. S. Gov., Veterans Administration. Specification VA-MC-95d; 1941. Portable Electric Floor Sanding Machine.

References.—Electric fans, *see* 711.23.

717.3 X-RAY AND CATHODE RAY APPARATUS AND EQUIPMENT

American Hospital Assn., 43-1. X-Ray Lead Apron. Covers one type, grade, and class.

American Hospital Assn., 43-7. Non-Graduated X-Ray Ureteral Catheters. Covers one type in three sizes.

American Hospital Assn., 43-22. Radio-Opaque (X-Ray) Gloves. Covers one type, one grade, and one class.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. X-Ray and High Frequency Apparatus. Requirements for barriers of separate inclosures, insulation and location of operating handles, high voltage leads, and tube terminals; requirements for circuit breaker and automatic switch in transformer circuit, grounding.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Protection of Photographic and X-Ray Nitrocellulose Films. Covers general storage of unexposed films including stores, warehouses and wholesale storage, and portrait and commercial studios; storage of film negatives including vented cabinets, vented storage vaults (inside), and outside storage houses; and general requirements for both unexposed films and film negatives.

U. S. Gov., Army Air Forces. Specification 20026a; 1943. Certification Procedure for the Certification of X-Ray Laboratories.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H20; 1936. X-Ray Protection. Contains a unified set of safety recommendations relative to protection from X-rays, electrical protection, X-ray equipment in anesthetic rooms, storage of X-ray film, and operating rules.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP56; 1929. The Precise Measurement of X-Ray Dosage. Includes a definition of the international unit of X-radiation; describes the equipment at the National Bureau of Standards and the method of use in the standard measurement of X-ray dosage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP211; 1930. An Improved Form of Standard Ionization Chamber. Describes a modification of the open-air parallel plate ionization chamber that is portable and is used in the measurement of X-ray intensity. Measurements are as accurate as those made with the primary standard described in RP56.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2414; 1934. Machine, X-Ray, Bedside Unit, Shock-Proof Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2443; 1937. Holder; Film Development.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2444A; 1939. Machine; X-Ray, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2448A; 1941. Film; X-Ray, Dental, Safety Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2621A; 1941. Film; X-Ray, Safety Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2669; 1939. Fluoroscope; Upright, Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2670; 1939. Machine, X-Ray, Bedside, Mobile, Shockproof.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2671; 1939. Machine; X-Ray, Stationary, Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2684; 1939. Palpator; Spoon Type, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2697; 1939. Stereoscope; Complete, for X-Ray Films.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2713; 1939. Holder; Film Exposure, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2741; 1939. Frame; Printing, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2772; 1939. Glove; Radio-Opaque, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2774; 1939. Stand; Tube, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2778; 1939. Apron; Lead, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2822; 1939. Cassette.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3003; 1942. Film; X-Ray, Photoroentgenographic, Safety Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1211; 1943. Tube VT-111; Cathode Ray.

U. S. Gov., Veterans Administration. Specification VA-X-110e; 1944. Films; X-Ray, Safety Type.

U. S. Gov., Veterans Administration. Specification VA-X-111c; 1944. X-Ray Films; Dental, Safety Type.

U. S. Gov., Veterans Administration. Specification VA-X-139b; 1936. Screens, Intensifying, X-Ray.

U. S. Gov., Veterans Administration. Specification VA-X-140c; 1938. Cassettes, Without Screens.

U. S. Gov., Veterans Administration. Specification VA-X-158; 1934. Stereoscope; X-Ray Diagnosis.

U. S. Gov., Veterans Administration. Specification VA-X-159d; 1940. Urological X-Ray Table.

U. S. Gov., Veterans Administration. Specification VA-X-160f; 1942. Mobile X-Ray Unit; Shock-Proof.

U. S. Gov., Veterans Administration. Specification VA-X-172; 1936. Oil Immersed Therapy Unit; Self-Contained.

U. S. Gov., Veterans Administration. Specification VA-X-183; 1938. Tube; X-Ray, Radio-Graphic, Air-Cooled Radiator Type.

U. S. Gov., Veterans Administration. Specification VA-MC-332; 1944. Tank; X-Ray, Developing, Two Compartment.

References.—Use of cathode ray oscillograph, *see* 718.65.

717.4 ELECTRICALLY-HEATED CLOTHING

U. S. Gov., Army Air Forces. Specification 3211-B; 1944. Suit; Flying, Electric, Type F-3A. 24 Volt D.C.

U. S. Gov., Army Air Forces. Specification 3212-B; 1944. Trousers; Electrically-Heated, for Type F-3 Suit.

U. S. Gov., Army Air Forces. Specification 3213-B; 1944. Jacket; Flying, Electric; for Type F-3A Suit.

U. S. Gov., Army Air Forces. Specification 3250; 1945. Blanket; Electrically Heated, Casualty, Type Q-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3116; 1942. Glove; Pilot's, Type E-1, Electrically Heated, 24 Volts D.C.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3117; 1942. Clothing; Electrically Heated.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3127; 1942. Helmet; Summer Flying, Type A-9.

718. TELEPHONE, TELEGRAPH, RADIO, AND SIGNAL APPARATUS

718.0 GENERAL ITEMS

American Institute of Electrical Engineers, joint sponsor with American Society of Mechanical Engineers. American Standards Assn., Z32.5-1944. Assn. of American Railroads, Telegraph and Telephone Section, M-2. Graphical Symbols for Telephone, Telegraph, and Radio Use. Only symbols which seem to have widespread use and application are given. These symbols are intended primarily to indicate electrical function only.

Assn. of American Railroads, Telegraph and Telephone Section, 1-D-1; 1931. Specification for Locating and Installing Transpositions in Telephone Circuits. For use in reducing cross talk in telephone circuits and inductive effects from telegraph and power circuits by interchanging positions of the two wires in each pair, and of the four wires in each phantom. Method of procedure, transposition diagrams, locating of "S" poles, laying out of sections, materials required, etc.

Assn. of American Railroads, Telegraph and Telephone Section, 1-D-8; 1942. Installation of Carrier Transpositions. For locating and installing transpositions for circuits used in carrier operation. Gives—part I, covering general requirements, locating transposition poles, location of transposition poles to meet construction requirements, "S" poles and junctions, special construction considerations, inductive coordination, installations of transpositions; part II, 30KC transposition system of the Western Union Telegraph Co. covering general requirements, design features, transposition diagrams, "S" pole transpositions, sections having whole line transpositions, and numbering transposition poles; and part III, type D transposition system of the Bell System covering general requirements, design features, transposition diagrams and sections, "S" pole transpositions, sections having whole line transpositions, modification of circuits not transposed for carrier operation, and numbering transposition poles.

Assn. of American Railroads, Telegraph and Telephone Section, 1-E-2; 1927. Instructions for the Making of Pole Line Diagrams for Communication Service

Along Railroads. Gives requirements for standard form of practice for recording and planning of pole line diagrams, size of forms, data to be recorded, and illustrations of standard diagrams.

Assn. of American Railroads, Telegraph and Telephone Section, 1-E-8; 1935. Instructions for the Maintenance of Outside Telegraph and Telephone Plant. Guide for maintaining pole lines, wires, and associated outside plant equipment, inspection, and trouble clearing. Includes general duties, tools and equipment, trouble prevention including tree trimming, tests of copper wire exposed to fire, etc., and correction of troubles.

Assn. of American Railroads, Telegraph and Telephone Section, 2-H-1; 1924. Locations and Layouts for Telegraph and Telephone Apparatus in Way Stations. Description and working drawings for minimum floor and wall space requirements of communication equipment based on four single telegraph, two selectored telephone, and two simplexed block telephone circuits.

Assn. of American Railroads, Telegraph and Telephone Section, 2-J-44; 1943. Typical Example of Laying Out a Type H Carrier System and Drawing Up Ordering Information. Gives general requirements, route, line, terminal and intermediate offices, circuit, determination of layout, effect on other circuits, layout system, and specification of order.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-5; 1924. Specification for Circuit Cross Connection Records for Wire Chief and Terminal Offices. Covers form of tabulated data for tracing office route of each circuit, numbering terminals, and illustrations of forms.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-29; 1941. Installation and Operation of Telegraph Directional "OS" Train Announcer. Gives scope, drawings, general requirements, description, and installation.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-33; 1942. Description and Operation of a Printer Key-Operated Selective Device. Gives purpose, drawings, general requirements, description, and operation.

Assn. of American Railroads, Telegraph and Telephone Section, 11-8; 1939. Portable Transmission Measuring Set. For measurement of volume of sound in decibels by radio frequency methods at 1,000 cycles, or a variable frequency range, with a described portable oscillator and receiver. Requirements for range in decibels, sensitivity, and accuracy.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Signal Systems. Telephone, telegraph, messenger, and call bell circuits, fire and burglar alarms. Insulation and separation from light and power wires, spacing on cross-arms, permissible kinds of insulation for aerial cables, thickness of rubber on wire entering building, requirements for arrestors, fuses, grounding, and size of grounding wire for aerial wires.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment. (Comprising Part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators—and the grounding rules of the Fifth Edition, National Electrical Safety Code.) For telephone and other communicating apparatus on circuits exposed to supply lines or lightning (Section 39), protective requirements, guarding current-carrying parts, and grounding.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-937B; 1940. Testing of Transmitters and Receivers, for Telephone and Radio Use.

References.—Ground clamps, *see* 719.72.

718.1 TELEGRAPH APPARATUS

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-51; 1930. Lamp Mounting AAR-3-A. Gives details for design of sheet metal frame for mounting lamp panel AAR-5-A used in telegraph switchboards; gage of metal, dimensions, and finish.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-52; 1930. Lamp Panel AAR-5-A. Description of lamp panel for use with telegraph switchboards on which are mounted six P. and S. No. 54 sign lamp receptacles; requirements as to quality of materials, workmanship, dimensions, assembly, and tests, with dimensional drawings of parts and assembly.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-26; 1937. Dotter for Balancing Duplex Sets. For causing reversal of current in adjusting telegraph circuits, schematic outline, and method of operation.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-118. Rectifier; Copper-Oxide, for Teletype Equipment Operation.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-152. Line-Termination Panel Unit, for Tone Telegraph System.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-217. Push Key Switching Unit, for Teletype Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-283. Rectifier; Heavy Duty, 6-Ampere, for Teletype Equipment Operation.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-315. Teletype Signal Distortion Transmitter Distributor (Bias Test Set).

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-318. Teletype Test Set.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-319. Polar Relay Test Set; Teletypewriter.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-331. Printing Telegraph Page Type Printer Unit, with Keyboard.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-332. Printer Unit, Page Type, Perforating Transmitting Keyboard.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-333. Reperforator Unit; Printing Telegraph for 11/16 Inch Tape.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-334. Printing Telegraph Keyboard, Free Speed; Perforator Unit for 11/16 Inch Tape.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-335. Printing Telegraph, Disc Type; Transmitter-Distributor Unit for 11/16 Inch Tape.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-346. Printing Telegraph Equipment Assembly for D.T.X. Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-406. Perforator Unit, for Telegraph Printing Keyboard.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-407. Power Supply; Dry Disc Rectifier Type (Filtered) 0.6 Ampere, 120-Volt, for Operation of a Combined Printing Telegraph Machine With Perforator and Transmitter-Distributor.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-408. Power Supply; Dry Disc, Rectifier Type (Unfiltered) 0.6 Ampere, 120-Volt, for Perforator.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-419. Circuits; Standard Printing Telegraph.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-459. Printing Telegraph Equipment Cabinets and Assn. Equipment.

References.—Engine telegraphs for ships, *see* 718.39; definitions of circuits, standard symbols, wiring requirements, *see* 718.0; telegraph table, dispatchers table, *see* 613.6.

718.11 Telegraph Instruments

U. S. Gov., U. S. Army, Signal Corps. Specification 71-9-F; 1926. Simplex Telegraph Set; Type EE-76.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-95-A; 1925. Resonator; Type TG-3, Telegraph.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-266A; 1925. Sounder; Type EE-11, Telegraph.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-289A; 1925. Switchboard; Types BD-52 and BD-53, Telegraph, 8-Line and 20-Line.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-292A; 1925. Switchboard; Types BD-50 and BD-51, Telegraph, 4-Line and 8-Line.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-300; 1924. Repeater; Automatic Telegraph, Closed Circuit Single Line, Morse.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-468B; 1940. Switchboard; Type BD-( )-57A, Code Practice Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-491; 1939. Code Transmitter and Recorder; Type TG-8-A, Code Practice Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-556C; 1944. Telegraph Set; Type TG-5-B.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1012; 1942. Printer TG-7-( ), Page, Telegraph; and Chests CH-50-( ) and CH-62-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1039; 1941. Line Unit; Type BE-77, Telegraph Printer.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1310; 1942. Switchboard BD-100; and Chest CH-70, Telegraph Printer.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1316A; 1943. Relay BK-27( ); Telegraph Repeater.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1646; 1943. Repeater TG-30; Terminal.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1647; 1943. Repeater TG-31; Intermediate.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-10-B; 1941. Typewriter; Type MC-88, Telegraphers'.

718.12 Telegraph Keys

Assn. of American Railroads, Telegraph and Telephone Section, 6-5; 1921. Semi-Automatic Sending Keys. Describes general principles, mechanical adjustment of spring and lever action, contact points, electrical adjustment, and training of operator in proper spacing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-265; 1924. Key; Telegraph.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-291B; 1935. Key; Type J-36, Telegraph, Vibrating.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-377; 1925. Key; Type J-5-A, Airplane, Flameproof.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-469B; 1942. Key J-38; Telegraph.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-677; 1933. Key; Type J-40, Fastens to Operator's Leg.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-708; 1935. Key; Type J-43, Telegraph.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-721; 1935. Key; Type J-45, Telegraph.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1399; 1944. Relay Unit BE-84-( ); Teletype, Trunk.

718.2 TELEPHONE APPARATUS

718.20 General Items

Assn. of American Railroads, Telegraph and Telephone Section, 2-J-37; 1941. Installation and Maintenance of Type H1 Single-Channel Carrier Telephone Equipment. Gives purpose, scope, general requirements, drawings, testing equipment, description and functions of component units, power supply requirements, transmission performance, characteristics of open-wire lines and cables, application, installation, overall system line-up, service adjustments, trouble location tests, and apparatus requirements and adjusting procedures.

Assn. of American Railroads, Telegraph and Telephone Section, 2-J-38; 1941. Installation and Operation of Telephone Directional "OS" Train Announcer. Gives scope, drawings, general requirements, description, and installation.

Assn. of American Railroads, Telegraph and Telephone Section, 2-J-39; 1941. Installation, Operation, and

Maintenance of 1,000-Cycle Ringing Equipment. Gives scope, theory, drawings, equipment details, operation, installation, and maintenance.

Assn. of American Railroads, Telegraph and Telephone Section, 2-J-41; 1942. Installation, Maintenance, and Operation of Selenium Rectifiers for Telephone Service. Gives scope, drawings, general requirements, description, theory, installation, and maintenance of rectifier.

Assn. of American Railroads, Telegraph and Telephone Section, 2-J-42; 1943. Installation and Maintenance of Type 15-A Carrier Telephone Equipment. Gives purpose, scope, general requirements, drawings, description and functions of component units, transmission performance, effect on other services, characteristics of open-wire lines and cables, installation, testing equipment, and initial and routine tests and adjustments.

Assn. of American Railroads, Telegraph and Telephone Section, 4-22; 1941. Installation and Maintenance of Acoustical Shock Reducers. Gives purpose, drawings, description, installation, and maintenance.

Assn. of American Railroads, Telegraph and Telephone Section, 10-6; 1942. Suggested Questions With Answers That May Be Used as an Aid in Determining the Qualifications of Telephone Maintainers. Gives introduction, general requirements, alternating current selector systems, and direct current selector systems.

Assn. of American Railroads, Telegraph and Telephone Section, 11-1; 1939. Telephone Transmission. Recommendations to user, and fundamentals of telephone communication including efficiency of transmitter, receiver, lines, railroad circuits, transmission losses by resistance, leakage, inductance, capacitance, characteristic impedance, return loss and insertion loss, distortion, interference, and reference standards; line facilities and equipment.

Assn. of American Railroads, Telegraph and Telephone Section, 11-4; 1926. Standardization of Transmission Unit. Defines transmission unit; gives application and comparison with previous unit of "mile of standard cable."

U. S. Gov., U. S. Army, Signal Corps. Specification 71-531; 1930. Moistureproofing of Induction and Ringer Coils and Capacitors; Telephone.

718.21 Telephone Instruments

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-71; 1932. Portable Telephone Set. For use on magneto telephone circuits including those equipped with selectors by construction, maintenance, and operating forces. Requirements for line terminals, sturdiness, weatherproofing, batteries, insulation, transmission efficiency, generator output, dimensions of carrying case, and gross weight.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Telephone Instruments, All Kinds; Forest Service Telephone Handbook.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-7F; 1924. Telephone, Common Battery, Types EE-69, EE-72, EE-73, EE-74, EE-75, EE-77; and Hand Telephone Switch, Type EE-78.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-27-C; 1922. Telephone; Types EE-66 and EE-67, Portable, Balloon.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-165E; 1932. Telephone; Common Battery, Metal Case, Desk and Wall.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-259A; 1929. Telephone; Type EE-4, Formerly Camp Telephone Model A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-281; 1924. Relay; Telephone, Self-Restoring Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-302B; 1928. Telephone; Type EE-5, Portable, LB Leather Case.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-352D; 1929. Telephone; Head, Type EE-70.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-353A; 1931. Telephone Box; Types EE-71 and EE-72, for Wall Mounting.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-354; 1931. Handset; Type EE-69, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-356A; 1931. Telephone Box; Type EE-74, Fire Control, Plotter's Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-357A; 1931. Telephone Box; Type EE-75, Fire Control, Gun Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-484B; 1931. Handset; Type TS-7, for Portable Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-472B; 1933. Telephone Unit; Type BE-58, for Antiaircraft Plotting.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-493; 1940. Receiver; Type R-2-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-509; 1930. Headset; Type P-12, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-529; 1933. Panel; type BD-65, telephone Power.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-530A; 1931. Transmitter; Type T-13, Telephone, Chest Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-541A; 1932. Headset; Type P-13, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-588; 1932. Head and Chest Set; Type HS-17, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-609; 1932. Telephone; Common Battery, Wooden Case, Desk and Wall.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-625; 1931. Receiver; Type R-13, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-627; 1931. Chest Unit; Type T-16, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-631B; 1943. Telephone EE-8-B; Portable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-667C; 1938. Handset TS-9-( ); Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-703; 1944. Handset TS-10-( ); Bound Powered.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-707B; 1944. Telephone Box EE-91; Wall Telephone, Less Transmitter and Receiver.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-803-E; 1938. Headset; Type HS-18, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-863; 1938. Headset; Type HS-23, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-926B; 1942. Receiver R-21-A and R-22-A; Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-929A; 1937. Head and Chest Set; Type HS-19, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-930; 1937. Head and Chest Set; Type HS-17-A, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1183A; 1943. Headset HS-33; Telephone, Low-Impedance, Headband Type, for Use in Aircraft.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1188A; 1943. Headset HS-38.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1315; 1942. Handset TS-14-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1529; 1944. Chest Sets TD-1-A and TD-2-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3024; 1944. Telephone TP-6-( ).

References.—Telephone head set for radio, *see* 718.69; safety code for telephone apparatus exposed to electric supply lines, *see* 710.

718.22 Telephone Switchboards

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-9; 1924. Porcelain Jack Panel AAR-4-B. Requirements for white porcelain panel used in mounting 16 jacks on switchboard frame, insulation resistance, absorption tests, and dimensional drawing.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-37; 1928. Moulded Composition Jack Panel AAR-4-C. For mounting jacks on switchboard frame works, panel made from moulded homogeneous black composition, insulation resistance test requirements, and dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-46; 1929. Switchboard Framework. For use in supporting electrical apparatus comprised in switchboard; give list of tees, angles, straps, braces, bolts, etc., necessary in assembly; requirements for dimensions and finish, with drawings of assembly and details.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-55; 1930. Test Panel Unit AAR-8-A. Describes construction of sheet metal test panel with hinged front, with dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-56; 1930. Filler Panels AAR-1-A. Includes eight standard sizes of filler panels used to fill unoccupied spaces in switchboards; dimensions, construction, and finish.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-57; 1930. Lamp Rack Wiring Shield AAR-1-A. For mounting on switchboard framework AAR-2-F to protect the wiring of the equalizing lamps, form and dimensions of asbestos board and sheet metal shield, and finish.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-73; 1935. Indicating Telephone Jack Boxes. For use in way offices where five or more telephone circuits are cut in for service, in ten- and twenty-line sizes; requirements as to design, materials, and workmanship; finish and tests.

U. S. Gov., U. S. Army, Signal Corps. Specification 68-19; 1927. Switchboard; Western Electric 550-B, Modification.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-109B; 1925. Coil; Type C-61, Retardation, for Telephone Transmitter Circuit.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-304B; 1931. Switch, Types SW-85, SW-86, SW-87, and SW-88; Porcelain-Base Knife Switch.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-340; 1927. Switchboard; Type BD-55, Field Multiple.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-342A; 1926. Switchboard; Type BD-49, Camp and Field Use.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-355A; 1931. Switchboard; Type EE-78, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-452A; 1932. Switchboard; Telephone, Common Battery, Nonmultiple.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-488; 1939. Switchboard Equipment; Telephone, Automatic.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-686C; 1943. Switchboard BD-71 and BD-72; Monocord, 6- and 12-Line.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-995; 1942. Switchboard; Type BD-89.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1007; 1941. Switchboard BD-96; Magneto Switchboard.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1015; 1942. Switchboard; Type BD-80-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1611; 1943. Switchboard BD-120-( ).

References.—Porcelain for electrical purposes, *see* 532.22; slate for electrical purposes, *see* 511.53; molded insulation, *see* 719.58; symbols, methods of testing, safety codes, *see* 710; switchboard equipment, *see* 718.29.

718.29 Miscellaneous Telephone Equipment

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-7; 1924. Block Mounting AAR-1-A. Gives dimensional requirements of steel bracket for mounting terminal blocks or fuse blocks.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-8; 1924. Terminal Block AAR-2-C. For terminating 10 wires, white porcelain block with suitable soldering clips, requirements as to quality, absorption, gage of brass stock, and dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-10; 1924 Jack AAR-200-A. Covers design, materials, and workmanship, with dimensional drawings of parts and assembly.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-12; 1924. Single Conductor Plug AAR-1-A. For use in conjunction with patching cords on pin jack switchboards; detailed dimensions of brass body, fiber sleeve, screws, and test gage.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-13; 1924. Designation Card Holder AAR-34-A. For use in conjunction with porcelain jack panel AAR-4-B; gage of brass, enamel finish, and dimensional drawing.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-14; 1924. Porcelain Filler Button AAR-3-A. For use with porcelain jack panel AAR-4-B; requirements for white porcelain material, water absorption test, and dimensional drawing.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-17; 1925. Jack AAR-202-A. For use in switchboards, body of cast brass, contacts of German silver, insulation of mica or micanite, composition and hardness requirements, test requirements and permissible variations, with dimensional drawings of parts and assembly.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-27; 1927. Double Conductor Plug AAR-3-B. For use with cords on pin jack switchboards; body of brass with inner steel rod insulated with hard rubber, quality of materials, workmanship, and drawings of dimensional requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-35; 1928, and 2-G-36; 1928. Jacks AAR-221-A and AAR-228-A. For use in switchboards, test panel, and other railway purposes; gives detail requirements for body of cast brass, contacts of German silver, mica or micanite insulation, finish, and tests, with dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-41; 1928. Dummy Plug AAR-165-A. For use on switchboards and test panels; seasoned maple wood plug, dimensional diagram, workmanship, and finish.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-47; 1929. Distributing Frame AAR-1-A. Description and dimensional drawings of angle-iron framework, enamel finished.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-48; 1929. Wall Distributing Frame AAR-4-A. For angle-iron framework, material and workmanship, enamel finish requirements, with dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-50; 1930. Relay Rack AAR-1-A. For use in mounting communication equipment, so designed that any number of bays may be assembled; list of parts for one bay, two bays, three bays, and additional bay, with drawings of assembly and details.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-53; 1930. Resistance Mounting AAR-4-A. For use in mounting resistance units AAR-6-B and AAR-8-B to regulate current in connection with communication apparatus. Covers quality of electrical slate, metallic clips, sealing compound, finish, and dimensional drawings and electrical test requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-59; 1930. Meter Bracket AAR-2-B. Describes design and construction of cast iron bracket for use on switchboard framework AAR-2-F for mounting electric meter.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-60; 1930. Jack Box AAR-11-B. Sheet metal jack box for use on switchboards, with dimensional drawings and material requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-61; 1930. Jack Panel AAR-10-C. Description for construction of slate panel for use on switchboards; dimensions and finish.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-65; 1931. Coil Racks AAR-1-A, AAR-2-A, and AAR-3-A. For mounting telephone and miscellaneous equipment, in three lengths; includes design, construction, and finish, with bill of materials and working drawings for racks of steel and wood.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-69; 1932. Apparatus To Provide Switching Facilities Between Three or More Telephone Circuits. Gives general requirements, circuit characteristics, apparatus requirements and operating characteristics, prevention of interference, busy signal and ringback, and requirements for operation and maintenance.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-74; 1937. Unit Set Racks AAR-1-B. Gives general requirements, material and workmanship, dimensions, finish, assembly, inspection and tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-75; 1937. Cover Plates AAR-1-A. Gives General requirements, material and workmanship, dimensions, finish, assembly, inspection and tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-79; 1938. Terminal Block AAR-33-A, 6-Wire and 12-Wire. For use in local distribution installations for terminating cable. Construction of white porcelain with Fahnestock clips of phosphor bronze and with working drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-83; 1939. Floor Supported Relay Racks AAR-2-A to AAR-7-A, Inclusive. For use in mounting communication equipment; requirements for six sizes of racks so designed that a row of any number of bays may be assembled, with working drawings of assembly and details.

Assn. of American Railroads, Telegraph and Telephone Section, 4-21; 1939. Acoustic Shock Reducers. For connection to the telephone circuit in such a manner as will provide minimum interference with speech transmission and maximum reduction of abnormal potentials at the telephone receiver. Gives design, material and workmanship, electrical requirements, mechanical requirements, packing, marking, inspection and tests, and warranty.

U. S. Gov., Navy Dept. Specification 17H6a; 1944. Helmets; Blast, Telephone (Shipboard Use).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1C; 1923. Switch Key Set; Type EE-79.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-8-K; 1943. Test Set EE-65-G; Universal.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-32-C; 1924. Receivers; Types R-9, R-10, and 11, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-102; 1921. Buzzerphone; Type EE-1-A, Portable Field Telegraph Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-166A; 1931. Dial; Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-175; 1936. Transmitter; Type T-10.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-184C; 1930. Interphone Control Box; Type BC-123-A, Airplane.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-185B; 1928. Jack Box; Type BC-126.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-295-E; 1943. Test Set 1-51; Cable Repairman's.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-406; 1927. Telephone Transmitter Tests.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-537A; 1930. Jack Box; Type JB-15, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-538A; 1930. Jack-Box; Type JB-16, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-550A; 1933. Coil; Type C-75, Telephone, Repeating.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-618A; 1938. Cabinet; Type BE-70-( ), Wire Chief's Testing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-668B; 1938. Generator GN-38; Hand, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-669C; 1944. Ringer; Type MC-131, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-672B; 1939. Interrupter; Type BZ-5-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-682C; 1943. Coil C-111; Telephone, Repeating.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-687D; 1944. Coil; Type C-114, Telephone, Loading.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-733C; 1944. Coil; Types C-161 and C-288, Telephone, Repeating.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-804C; 1936. Receiver; Type R-14 Telephone, High Impedance.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-835; 1935. Amplifier; Interphone, Type BC-212, for Aircraft Interphone Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-836; 1936. Jack Box; Type BC-213, for Aircraft Interphone Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-845D; 1941. Jack Box; Type BC-213-B, Interphone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-846A; 1937. Interphone Control Box; Type BC-304B, Receiver Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-847A; 1937. Interphone Control Box; Type BC-305-A, Remote.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-848E; 1940. Amplifier; Interphone, Type BC-212-C, Aircraft, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-855A; 1941. Jack Box; Type BC-366.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-859B; 1939. Control Box; Type BC-327, Remote.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-860C; 1941. Interphone Control Box; Type BC-334, Master.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-861B; 1940. Interphone Box; Type BC-335, Remote.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-877-B; 1942. Interphone; Amplifier BC-347-C (Aircraft, Radio).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-928A; 1937. Chest Unit; Type T-26, Telephone Transmitter.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-941; 1940. Jack Box; Type JB-18.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1143; 1943. Interphone; Amplifier BC-709-( ), Aircraft.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1155; 1943. Interphone Equipment; RC-73, Aircraft.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1199; 1943. Interphone; Amplifier BC-1019, Aircraft.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1552; 1944. Telephone Terminal CF-1-( ); Carrier.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1609; 1943. Frame FM-64-( ); Distributing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1636B; 1943. Telephone Repeater EE-89-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1672; 1943. Dehydrator Cabinet CH-169-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3003; 1944. Test Set TS-27/TSM.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3039; 1944. Carrier Hybrid CF-7-( ).

References.—Structural steel shapes, *see* 605.12, 605.14; plugs and jacks for radio apparatus, *see* 718.69; porcelain for electrical purposes, *see* 532.22; switchboard cords, *see* 715.42; standard symbols, definitions of circuits, *see* 718.40.

718.3 SIGNAL DEVICES, OTHER THAN RAILWAY AND HIGHWAY SIGNALS

718.30 General Items

National Board of Fire Underwriters. Central Station Protective Signaling Systems, No. 71; 1940. Standards for the installation, maintenance and use of central station protective signaling systems for watchman, fire alarm, and supervisory service. Includes definitions, general requirements; common requirements; types of service including manual fire alarm service, watchman's supervisory service, automatic fire alarm service, sprinkler equipment supervisory and water flow alarm services, and automatic journal alarms; and appendix.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Signal Systems. Includes fire and burglar alarms, requirements on insulation and separation from light and power wires, spacing on cross-arms, permissible kinds of insulation for aerial cables, thickness of rubber on wire entering building, requirements for arresters, fuses, and grounding.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Central Station Protective Signaling Systems. Standards for the installation, maintenance, and use of central station protective signaling systems for watchmen, fire alarm, and supervisory service. Covers definitions, general requirements, common requirements, and types of services.

National Fire Protective Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Proprietary, Auxiliary, and Local Protective Signaling Systems. Standards for the installation, maintenance, and use of proprietary, auxiliary, and local protective signaling systems including local or isolated systems for fire alarm and supervisory service. Covers definitions, common requirements, types of services, proprietary systems, auxiliary fire alarm systems, local systems, and miscellaneous.

U. S. Gov. Navy Dept., Bureau of Yards and Docks. Specification 35Y; 1941. Alarm Systems (Fire, Crash, Supervisory, and Watchman) (Proprietary Type).

718.31 Burglar Alarms

Underwriters' Laboratories, Inc., 1944. Lists of Inspected Appliances Relating to Accident Hazard, Automotive Equipment, Burglary Protection. This catalog contains three lists that have been inspected by the Underwriters'. The lists are appliances inspected for accident hazard; inspected automotive appliances and inspected burglary protection appliances. The listings are arranged alphabetically as to subject and alphabetically by name of manufacturer under each subject.

Underwriters' Laboratories, Inc. Standard for Central Station Burglar Alarm Systems, Subject 611; 1944. Covers central station burglar alarm systems intended for use at mercantile and banking premises and on safes and vaults for protection against burglary. Gives conditions for physical equipment and protection service for grade B, grade A, and grade AA requirements; and covers transmitter systems, combination transmitter and local systems, and inspection of listed systems.

Underwriters' Laboratories, Inc. Standard for Holdup Alarm Systems, 1933. Remote-station type for banks, stores, cashier cages, etc., for transmitting silent alarm signals. Bandit-resistant enclosure, semiautomatic alarm system, manual alarm system, design and construction, operation and electrical supervision, installation, maintenance, and marking.

Underwriters' Laboratories, Inc. Standard for Installation, Classification, and Certification of Burglar Alarm Systems, Subject 681; 1941. Classified as to type or principle of operation as central station or local; grouped according to class of property for which suitable as bank safe and vault, mercantile premises, or mercantile safe and vault; and each system is divided into two or more grades. Gives requirements for installation of burglar alarm systems, rules for classification of burglar alarm installations, and classification of installations.

Underwriters' Laboratories, Inc. Standard for Local Burglar Alarm Systems, Subjects 609 and 610; 1942. Classified as grade A or grade B according to construction, operation, and performance, and are classified as to their suitability for use either on mercantile premises, on mercantile safes and vaults, or on bank safes and vaults. Gives common requirements for all local systems, mercantile premises alarms, mercantile safe and vault alarms, and inspection of listed systems.

U. S. Gov., Federal Specification W-W-101; 1931. Watchmen's Report-Apparatus. Covers one type only; battery-operated system for registering at a central office through visible and audible means each report of a watchman from a local station, for making permanent record of the time of such report, and for providing telephone communication between watchman's reporting station and central office. Gives detail requirements for report stations, watchman's equipment, wiring, central office equipment, and operation; method of inspection and test; and requirements for packaging, packing, and marking.

References.—Burglar alarm systems, *see* 718.30; alarm bells, *see* 718.33; cables and insulated wire, *see* 715.41, 715.44.

718.32 Fire Alarms

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No.45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Fire Alarm Systems. Includes fire detection systems of electric, pneumatic tube or bulb, smoke pipe, or automatic sprinkler; and visual and audible alarm systems; thermostats, wiring, location, manual alarm, power supply, and supervision requirements.

Assn. of American Railroads, Telegraph and Telephone Section, 2-J-18; 1931. Fire Alarm Systems for Railroad Properties. Includes manual alarm systems and fire detecting systems; requirements for fire alarm boxes, circuits, operating energy, master box, central coding machine systems, alarm apparatus such as whistles and horns, recording registers, fixed point fire detecting system, heat actuating unit, "rate of rise" detecting system, connection to municipal system, and central office supervision.

International Municipal Signal Assn., Inc. Specification No.61; 1942. A Fire Alarm Box Grounding Assembly. Covers a grounding assembly for grounding boxes in fire alarm, police signal, and other municipal signal systems. Gives requirements for material, conductor, fittings, accessories, packing and marking for shipment, and rejection.

International Municipal Signal Assn., Inc. Specification No.62; 1942. Ground Rods. Covers ground rods for use in fire alarm, police signal, and other municipal signal systems. Gives requirements for material, properties, identification, packing and marking for shipment, and rejection.

International Municipal Signal Assn., Inc. Equipment Specification No.102; 1942. Fire Alarm Box—Underground Pedestals. Covers details for a fire alarm pedestal for use on underground municipal fire alarm and police telegraph systems. Gives requirements for general design, dimensions, pedestals, shafts, anchor rods, finish, workmanship, and inspection tests.

National Board of Fire Underwriters. Proprietary, Auxiliary and Local Signaling Systems, No.72; 1941. Standards for the installation, maintenance, and use of proprietary, auxiliary, and local systems for watchman, fire alarm, and supervisory service. Covers definitions, common requirements, wiring, current supply, battery cabinets, sounding devices, fire alarm boxes, electrical supervision, types of service, proprietary systems, auxiliary fire alarm systems, local systems, and miscellaneous.

National Board of Fire Underwriters. Municipal Fire Alarm Systems, No. 73; 1941. Standards for the installation, maintenance, and use of municipal fire alarm systems. Covers two systems—class A is one where operators are required to check the receipt of alarms and to retransmit them over alarm circuits to fire stations; and class B is one where alarms are transmitted and retransmitted automatically to fire stations. Gives general requirements, wiring for all systems, special rules applying to class A systems only, and special rules applying to class B systems only.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Alarms for Life Safety. Covers general requirements, sounding devices, alarm sending stations, automatic fire detection systems, supervisory control of alarms incidental functions, code signals, and connections to municipal departments.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Municipal Fire Alarm Systems. Standards for the installation, maintenance, and use of municipal fire alarm systems. Covers general requirements, wiring for all systems, special rules applying to class A systems (where operators are required to check the receipt of alarms and to transmit them over alarm circuits to fire stations), and special rules applying to class B systems (where alarms are transmitted or retransmitted automatically to fire stations).

U. S. Gov., Army Air Forces. Specification 40691-A-1; 1945. Detector; Fusible Alloy Fire, for Aircraft.

U. S. Gov., Federal Specification W-F-391; 1930. Fire-Alarm Systems; Electric, Hand Operated. Covers one type, a battery operated, presignal, positive noninterfering, code type, manual system using electromechanical signal gongs. Gives detail requirements for boxes, punch register, take-up reel, electromechanical gongs, control board, batteries, charging apparatus, charging board, and optional specifications; method of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification W-F-396; 1933. Fire-Alarm Systems; Electric, Hand Operated, Shunt-Type. Covers a double supervised code-ringing system using shunt-type noninterfering boxes and electric single-stroke gongs. Gives general requirements for combination systems, coded boxes, presignal system, conduit and wiring; detail requirement for boxes, punch register, take-up reel, time stamp, printing register, gongs, control board, cabinets, wiring, source of energy, supervisory system, and charging apparatus; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 17F11c; 1944. Fire Alarm Equipment (Shipboard Use).

U. S. Gov., Veterans Administration. Specification VA-M-277; 1937. Fire Alarm Punch Register and Take-Up-Reel.

References.—Fire alarm system, *see* 718.30; alarm bells, *see* 718.33; cables and insulated wire, *see* 715.41, 715.44; watchmen's report apparatus, *see* 718.31.

718.33 Bells, Buzzers, and Push Buttons

U. S. Gov., Navy Dept. Specification 17A8b; 1944. Annunciators; Call-Bell (Drop Type).

U. S. Gov., Navy Dept. Specification 17S11c; 1940. Signals; Audible, Interior Communication and Motor-Boat (Bells, Buzzers, Horns, and Sirens).

U. S. Gov., Navy Dept. Specification 23B2a; 1945. Bells; Ship and Motor-Boat.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 12-1; 1927. Button; Push.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 29-6; 1926. Bell; Vibrating.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-147B; 1938. Bell; Loud-ringing Extension, Type MC-9.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-255; 1924. Buzzer; Service Type EE-63.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-275; 1924. Buzzer Set; Type EE-14, for Student Instruction.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-305B; 1930. Bell; Time Interval.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-671; 1933. Buzzer; Type BZ-4 and BZ-6, Telephone, A.C.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-953A; 1941. Bell; Type MC-153.

References.—Methods of testing, safety codes, *see* 710; zinc and nickel plating, *see* 600.3; insulated wire, *see* 715.44; bell ringing transformers, *see* 713.5.

718.34 Sirens

U. S. Gov., Navy Dept. Specification 17S11c; 1940. For Signals; Audible, Interior Communication and Motor-Boat (Bells, Buzzers, Horns, and Sirens).

718.35 Time- Clock Systems

Underwriters' Laboratories, Inc. Standard for Time-Indicating and Recording Appliances, 1941. Covers electrically operated clocks, clock motors, time stamps, time-card recorders, and similar time-indicating and recording appliances to be employed on circuits of 300 volts or less in accordance with the National Electrical Code. Frame and enclosure, mechanical assembly, supply connections, insulating material, current carrying parts, internal wiring, performance, and out-door use appliances.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-618. Astronomic Dial Clock and Time Switch.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-791. Astronomic Dial Clock and Time Switch; Special.

U. S. Gov., Federal Specification W-C-471a; 1939. Clock-Systems; Electric. Covers four types—(A) a transformer-rectifier or battery operated, minute impulse master clock and secondary clock system; (B) clocks operated as a system by synchronous motors; and (C) a combination system. Gives requirements for each type; method of inspection and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-W-C-471a, Mar., 1943, (issued by Procurement Div., Treasury Dept., U. S. Gov.), deletes all reference to types A, B, C, and D clock-systems. Synchronous motor clock installations shall be operated independently and clocks shall comply with Federal Specification GG-C-486.

718.36 Maritime Signals

U. S. Gov., U. S. Maritime Commission. Specification 5-MC-4; 1942. Signals; Day Shapes, Black. Gives requirements for type, grade, materials, construction, framework, fabric cover, sampling, inspection, and tests, together with drawing.

718.37 Aircraft Signals

718.39 Miscellaneous Signal Devices

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No. 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Signal and Communication Systems. Covers source of current supply, installation and location of instruments, instrument details, push-buttons, bells, buzzers, engine order telegraph, etc. Alarm systems, general and for circulating systems affecting safety of ship, siren and whistle control, telephone equipment, and loud speaker system.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-227. Tube Lamp Approach Light Unit.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-281. Seadrome Contact Light.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-330. Neon Signs for Airways Site Identification.

U. S. Gov., Navy Dept. Specification 17S11c; 1940. Signals; Audible, Interior Communication and Motor-Boat (Bells, Buzzers, Horns, and Sirens).

U. S. Gov., Navy Dept. Specification 18H3a; 1932. Holders; Sounding-Tube, Sounding-Machine.

U. S. Gov., Navy Dept. Specification 36C1; 1933. Calls; Boatswains'.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-108F; 1943. Firing Signals EE-22 and EE-23.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-150A; 1932. Time-Interval Apparatus; Type EE-56.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-329; 1924. Switchboard; Type BD-47, Flash Ranging.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-330A; 1941. Outpost Unit; Type BE-51.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-549; 1931. Time-Interval Apparatus; Type EE-83, Mobile Artillery.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-621; 1932. Lamp Signal; Type M-124.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-622; 1932. Tripod; Type LG-9, for Signal Lamps.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-823A; 1931. Filter; Types MC-121 and MC-122, for Signal Lamps.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-881B; 1939. Switchboard; Type BD-74, Fire-Control Communication.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-965B; 1943. Time-Interval Signal BE-65.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-986; 1944. Time-Interval Apparatus; Type EE-85.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-968; 1940. Signal Generator, Type I-72, and Associated Vacuum Tube.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-984; 1941. Signal Lamp, Type M-132; and Lamp Mounting, Type FT-159.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1048; 1942. Keyer; Type TG-10-( ), Automatic.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1397; 1942. Signal Lamp Equipment EE-80-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1630; 1943. Alarm MC-420-( ); Cease Firing.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-101; 1942. Time Interval Multiplier PH-264-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 75-102; 1943. Signal Lamp Equipment SE-11.

References.—Noncorrosive coatings for metals, *see* 600.3; aircraft signals and signal equipment, *see* 724.3.

718.4 RAILWAY SIGNAL AND TRACK CONTROL EQUIPMENT

718.40 General Items

American Institute of Electrical Engineers, 17g5. Joint sponsor with American Assn. for the Advancement of Science, American Society of Civil Engineers, Society for Promotion of Engineering Education, and American Society of Mechanical Engineers. American Standards Assn., Z 10g5; 1933. Graphical Symbols Used for Electric Traction Including Railway Signaling. Used in diagrams for power apparatus, relays and instruments, electric traction, car control wiring, and to indicate types of railway signals.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. A.C. and D.C. Coded Signal Systems. Requisites in general, requirements for track circuit, signal operating and code selecting circuits, circuit design, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1937. A.C. Track Circuit Characteristics. Data to be taken for track circuit adjustment, rail impedance, and ballast resistance. Outline of form, precautions in recording, formulas, diagrams, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Alternating Current Track Circuits. Instructions for adjustment, phase angle measurements, circuit controllers, ballast resistance, bonding, and cross bonding, etc., including correction of defects.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Centralized Traffic Control. Gives detailed instructions for the location, nesessities of, and selection of safety control signals, etc. Includes power-operated switches, not power-operated switches, and adjuncts.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 130-40; 1941. Circuit Controller for Drawbridges. Gives detailed requirements for opening and closing of first and second voltage range electrical circuit between the shore structures and bridge ends of draw bridges. Design, wiring, contacts, voltage test, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Direct Current Track Circuits. Gives requirements for adjustment, circuit controllers, ballast, rail and bond resistance, batteries, bonding, insulated rail joints, rectifiers, relays, shunting sensitivity, and general conditions.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1930. Guide for Allocating Train Control Expenditures. For railway signal purposes expenditures are divided into charges to signal account, shop machinery account, and locomotive or rolling stock account.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Form of Agreement for Interlocking. This form is found in the American Railway Engineering Assn. Manual. This section contains form of agreement on principles applicable to joint use of signal facilities.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1938. Minimizing Condensation and Frost Conditions. Instructions for the precautionary measures to be used in railway signal service. Airtightness, housings, ventilation, sealing, and moisture absorption.

Assn. of American Railroads, Operating-Transportation Div. The Standard Code of the A.A.R., 1940. Includes operating rules, block signal rules, and interlocking rules. Gives definitions, diagrams; signals by color, whistle, hand, flag, and lamp; right-of-way, train orders, indications for various signal aspects for typical semaphore and equivalent color light, for signalmen, engine and train crews.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-34; 1943. Testing, Adjusting, and Maintaining Polar Relays; Types 1-F and 17-B. Gives purpose, drawings, description, adjustments, maintenance, tools, and nomenclature of relay parts.

718.41 Railway Signals

Assn. of American Railroads. Bulletin 3; 1942. American Standards Assn., D 8.1-1943. Railroad Highway Grade Crossing Protection. Recommended standards and practices for new installation of railroad-highway grade crossing signs, signals, and automatic gates. Drawings for grade crossing signs, flashing light type and wig-wag type signals, automatic gates, and auxiliary signs.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1943. Aspects and Indications for Continuous Automatic Cab Signals. Shows a diagrammatic chart covering this function.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Automatic Block Signaling Circuits. General design and installation requirements for track, signal operating, and signal control relay circuits.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Automatic Block Signaling Systems. Shall be installed and circuits so arranged that failure of any part of the system affecting the safety of train operation will cause all signals affected to give the most restrictive indications which conditions require.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1937. General Classification for Signal Interruptions. Caused by failure of material, apparatus, or parts maintenance, acts of omissions. Also by malicious interference, rail breakage, open or unlocked switches, acts of others, and other agencies.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Light and Motor Semaphore Signals. Instructions in general, for color light signal-searchlight type, position light, method of making service test, shop and field electrical torque tests, and tables of operating characteristics.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1943. Technical Terms Used in Signaling. Standard nomenclature of electrical engineering usage and related subjects defined.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, Specification 63-41; 1944. Automatic Block Signal System. Covers track to be signaled, buildings, power supply, distribution system (aerial, surface, underground, submarine), foundations, signals, conduits, wires and cables, instrument and battery housing, relays, insulation, painting, bonding, and energy for operating signals, track circuits, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 79-41; 1942. Electric Motor Semaphore Signal. For the purpose of providing an electric motor semaphore signal. Covers drawings, material and workmanship, signal masts, bases, bracket posts, cable outlets, pinnacles, ladders, semaphore spectacles, motor and mechanism bearings, semaphore bearings, semaphore shaft, lamp brackets, marker lights, lamps, take siding indicator, roundels for signals, blades, numerals and letters, binding posts, mechanism cases, operating connections—mechanism at base of mast, general mechanism, gears, wiring, terminal board, counters, motor, hold clear device, circuit controller, buffer, finish, dielectric requirements, insulation, identification, painting, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 80-39; 1939. Electric Color Light Signal. Details as to design, lamp units, lamps, range markers, mounting and wiring, all as covered by A.A.R., Signal Section requirements.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 81-43; 1944. Position Light Signal. For the purpose of providing a position light signal. Covers design, high signal, framework, lamp units, terminal box, dwarf signal, electric lamps, hoods, lenses, and roundels, cover glass, range, spread, marker lights, mounting, wiring, binding posts, insulation, dielectric requirements, painting, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 121-27; 1927. Compensation of Pipe Lines for the Operation of Mechanical Units. 10 in. by 13 in. crank compensator, details for territory above or below 120° F., for various lengths of stroke, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 162-43; 1944. Color Position Light Signal. Covers material and workmanship, design, high signal, dwarf signal, adapter, electric lamps, hoods, lenses and roundels, range, spread, marker lights, mounting wire and wiring, binding posts, insulation, dielectric requirements, paint and painting, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 174-42; 1943. Electric Lamp Case. Case for electric lamp to be used with reflector for semaphore signal light. Covers drawings, tender, material and workmanship, general requirements, gray iron or castings, reflector, dielectric requirements, painting, inspection, tests, packing, marking and warranty.

Assn. of American Railroads, Operating-Transportation Div. The Standard Code of the A.A.R., 1940. Includes operating rules, block signal rules, and interlocking rules. Gives definitions, diagrams, signals by color, whistle, hand, flag, and lamp; right-of-way, train orders, indications for various signal aspects for typical semaphore and equivalent color light, for signalmen, engine, and train crews.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-30; 1941. Description and Operation of a Printer Start-Stop Regenerative Repeater. Gives purpose, drawings, general requirements, description, and operation.

References.—Signalling, symbols, testing, standard aspects, wiring, circuits, etc., *see* 71. 40: lenses and roundels, *see* 525.3; track transformers, line transformers, *see* 713.5; signal lighting transformers, *see* 713.5; track bonding, *see* 718.49; relays, *see* 718.43; definitions, symbols, voltage and rating standards, methods of test, safety codes, for electrical apparatus, *see* 710; cast iron, forged steel, shafts, *see* 611.11, 611.51, 611.52; impregnation of windings, *see* 719.57, 719.59; other electric motors, *see* 711.21, 711.22; plain bearings, ball and roller bearings, *see* 692.3, 766.2; choke coils and lightning arresters, *see* 715.50, 715.51; electric lamps for signal apparatus, *see* 716.11; switchboard for signal systems (alternating current), *see* 714.42; resistors for signal apparatus, *see* 714.12; oil lamps for signals, *see* 997.1; other signals and signal controlling devices, *see* 718.42.

718.42 Switch Operating Mechanisms and Signals

American Institute of Electrical Engineers, sponsor, No. 16; 1933. American Standards Assn., C48-1931. Electric Railway Control Apparatus. Requirements on the control apparatus on all electrical railway applications, including trackless trolleys or vehicles in which electric motors are used for propulsion. Includes definitions, rating, heating limitations, limitations other than heating, and dielectric test.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1939. Automatic Gates for Highway Crossings at Grade Over Railway Tracks. Warning signals, design of mechanism, timing of circuits, lighting, painting, adjustment, and repair.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Automatic Interlocking. Apparatus must be maintained and tested in accordance with instructions for interlocking and instructions for automatic block signaling systems in so far as they apply. Gives details for testing.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Car Retarder Systems. Instructions for use, lubrication, adjustment, replacement of parts, insulation, retarders, skates, and tests, including electro-pneumatic system.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1943. Electric Locking. Tests must be made to determine that locking functions are as intended. Covers approach relay, approach locking, time locking, indication locking, switch locking, and traffic locking.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Electric Locks for Interlocking Machines. Instructions for the care, operation, and testing of railway signalling systems.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Interlocking. Instructions for maintenance, operation, and testing of mechanical locking; mechanical, electro-pneumatic, and electric signal mechanism.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1943. Signal Protection for Spring Switches. Spring switch consisting of spring oil buffer and reinforced pair of switch points. Mechanism may be locked or nonlocked type. Covers marker, signal protection, and speed restrictions.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Spring Switches. For the care of railway signal service, switches, adjustment of buffers, oil in buffer, wear, rod packing, facing point locks, train trail test.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Switch Circuit Controllers. Adjustment of switch point opening, securing to ties, bolting, etc., gaskets, ventilator openings, and sealing.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 65-42; 1944. Electric Interlocking. Covers requirements for buildings, power supply, distribution system (aerial, surface, underground and submarine), control apparatus, interlocking machine, foundations, switch operating mechanism and fittings, signals, communicating system, wires and cables, trunking, conduit and supports, instrument and battery housings, insulation, bonding, and painting.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 66-41; 1944. Electro-Mechanical and Mechanical Interlocking. Covers requirements for buildings, power supply, distribution system (aerial, surface, underground and submarine), control apparatus, interlocking machine, foundations, leadout, pipe line, switch-and-lock movement and fittings, signals, communicating system, wire and cables, trunking, conduit and supports, instrument and battery housing, insulation, bonding, painting, and padlocks.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 67-43; 1944. Electro-Pneumatic Interlocking. Includes requirements for buildings, electric and pneumatic power supply, distribution system (aerial, surface, underground, submarine, and main air pipe line), control apparatus, interlocking machine, foundations, switch operating mechanism and fittings, signals, communication system, wires and cables, conduit and supports, instrument and battery housings, insulation, bonding, and painting.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 75-42; 1943. Mechanical Interlocking Machine, S. and F. Locking. For the control of signals, switches, and other interlocking units. Covers drawings, material and workmanship, design, levers, locking, painting, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 76-39; 1939. Electric Interlocking Machine. For railway signal purposes, machine for interlocking units. Requirements for machine details, levers, mechanical and electric lever locking, time locks, surface leakage distance, and test of insulation.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 95-39; 1939. Universal Switch Circuit Controller. Apparatus for application to track switches, derails, or other movable apparatus for the control of signal circuits. General design requirements, cam shaft and cam, operating crank, contacts, connections, and voltage test.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 99-42; 1943. Electric Locks for Interlocking Machines. For first and second voltage ranges for application to interlocking machines. Covers drawings, material and workmanship, design, coils, contacts, finish, painting, binding posts, coil insulation, dielectric requirements, identification, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 101-43; 1944. Electric Motor Switch Operating Mechanism. Provides for motor driven mechanism with or without dual control, for operating switches, derails, and other movable apparatus. Covers material and workmanship, power operating requirements, hand throw operating requirements, design, wiring, binding posts, finish, painting, coil insulation, dielectric requirements, identification, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 114-42; 1943. Mechanical Interlocking Machine, Style "A" Locking. For controlling signals, switches, and other interlocking units. Covers drawings, material and workmanship, design, levers, locking, painting, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 134-43; 1944. Electro-Mechanical Interlocking Machine. For the control of switches, signals, and other interlocking units. Covers material and workmanship, design, electric levers, locking, electric lever locks and locking, time locks, circuit controllers, lever lights, binding posts, cases, finish, painting, coil insulation, dielectric requirements, identification, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 138-39; 1939. Interlocking Lever Circuit Controller. For application to interlocking machine in railway signal service. General requirements as to design, materials, contact opening, mounting, location, voltage test, and surface leakage distance.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 141-43; 1944. Automatic Interlocking. For the installation of system. Including power supply, distribution system, (aerial, surface, underground, and submarine), control apparatus, foundations, switch-operating mechanism, signals, wires and cables, conduit and supports, instrument and battery housings, insulation, bonding, and painting.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 147-40; 1944. Car Retarder System. Covers buildings, power supply, distribution system (aerial, surface, underground, submarine, and main air pipe line), control machine, car retarder, operating mechanism, switch operating mechanism, signal system, communicating system, foundations, wires and cables, trunking, conduit and supports, instrument and battery housing, insulation, bonding, and painting.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 149-43; 1944. Centralized Traffic Control. Includes requirements for tracks to be signaled, buildings, electric and pneumatic power supply, distributing system (aerial, surface, underground, submarine and main air pipe line), control apparatus, centralized traffic control machine, foundations, switch operating mechanism and fittings, signals, communication system, wires and cables, conduit and supports, instrument and battery housings, insulation, bonding, and painting.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 150-43; 1944. Centralized Traffic Control Machine. A machine for the control of signals, switches, and other apparatus of a centralized traffic control system. Covers drawings, material and workmanship, design, levers, relays, circuit controllers, binding posts and terminals, light indicators, finish, painting, coil insulation, dielectric requirements, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 152-43; 1944. Electro-Pneumatic Switch Operating Mechanism. Device for operating and locking switches, derails, and movable point frogs, with detail of the power and hand operating requirements, for new installations and renewals.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 157-39; 1939. Electric Color Light Signal Operating Mechanism; Searchlight Type. Includes requirements for material and workmanship, mounting, signal mechanism case, operating mechanism, lenses and roundels, color discs, electric lamps, range, spread, operating characteristics, dielectric requirements, sealing and calibration, name plate and wiring diagram, coils, purchaser's order, paint and painting, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 175-40; 1941. Interlocking at Drawbridges for the Protection of Train Movements. Devices for insuring that bridge and rails are in proper position for the safe passage of trains. Interlocked power, bridge surfacing, rail-end connections, signals, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 198-42; 1943. Electric Switch Locks. For electric locks for first and second voltage ranges for application of track switches. Covers drawings, material and workmanship, design, coils, contacts, finish, painting, binding posts, coil insulation, dielectric requirements, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operating-Transportation Div. The Standard Code of the A.A.R., 1940. Includes operating rules, block signal rules, and interlocking rules. Gives definitions, diagrams, signals by color, whistle, hand, flag, and lamp, right-of-way, train orders, indications for various signal aspects for typical semaphore and equivalent color light, for signalmen, engine and train crews.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-606A; 1931. Cord; Type CO-72, 5 1/2 Inch, Single-Conductor.

References.—Signaling, standard aspects, symbols, wiring, circuits, etc., *see* 718.40; railway signals, *see* 718.41; methods of making electrical tests, *see* 710; wrought-iron pipe and steel pipe for signal and switch operation, *see* 607.3, 607.4; *see* references under 718.41.

718.43 Relays

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Alternating Current Relays. Instructions for meters, repairing, coils, flexible connections, contacts, end play, clearance, operating characteristics, recording, field inspections, shop and field testing, and table of operating characteristics.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1943. Minimizing the Effect of Foreign Current on Direct Current Track Circuits. The length of the track section shall be such that the difference of potential between rails with no rail connected will not be sufficient to operate the relay. Covers arrangements of track circuits, bonding, insulated joints, ballast, and foreign current.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1940. Tractive Armature Direct Current Relays. Gives meters, repairing, coils, flexible connections, contacts, armature end play, air gap, general operating characteristics, recording, sealing, final test, shipping, and field tests and inspections.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 78-39; 1939. Alternating Current Relay. For the control of signals and interlocking apparatus of first, second, or third voltage range. Enclosure, clearance, contacts, dielectric requirements, operation, and identification marking.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 105-39; 1939. Tractive Armature Direct Current Neutral Relay with Two or More Contact Fingers. Covers description of relay, for railway signal service, mounting, armature supports, coils, size of two to ten contact units, and their operating characteristics.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 148-39; 1939. Alternating Current Power Transfer Relay. For low voltage power transfer relay, to be used in signal service. Gives requirements as to design, mounting, armature supports, air gap, coils, contacts, adjustment, and operating characteristics.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended.Practice. Specification 154-39; 1939. Tractive Armature Direct Current Neutral Relay for Series Line Approach Lighting. Relay for railway signal service, first voltage range, with two contact fingers for series line approach lighting; gives details to the design, construction and operating characteristics.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 165-41; 1942. Tractive Armature Direct Current Polarized Relay. For first voltage range with four or more neutral contact fingers and two or more polar contact fingers. Includes requirements for material and workmanship, design, mounting, armature supports, air gap, coils, contacts, flexible connections, binding posts, dielectric requirements, operating characteristics, finish, sealing and calibration, name plate, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 180-39; 1939. Centralized Traffic Control Detachable Type Neutral Direct Current Relay. Relay for control systems and other nonvital circuits, quick detachable type. Design, type of mounting, armature supports, air gap, coils, contacts, dielectric requirement, and tests.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 185-39; 1939. Flasher Relay. Direct current, first voltage range relay for railway signal service. Provided with four sets of normal and reverse contacts, outside dimensions given, mounting, armature supports, air gap, coils, operating characteristics, and calibration.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 186-39; 1939. Tractive Armature Direct Current Neutral Interlocking Relay. Relay for interlocking railway signal service, first voltage range; covers design, mounting, armature supports, air gap, coils, contacts, interlocking mechanism, operating characteristics, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 197-41; 1942. Time Element Relay (Tractive Armature Type). Includes requirement for material and workmanship, design, mounting, armature supports, air gap, coils, contacts, flexible connections, binding posts; timing element, dielectric, operating characteristics, finish, sealing and calibration, name plate, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 202-43; 1944. Time Element Relay (Thermal Type). For the purpose of providing a bimetallic type thermal relay for operation on d.c. or a.c. first voltage range. Covers material and workmanship, design, mounting, heating element, flexible connectors, contacts, binding posts, dielectric requirements, operating characteristics, finish, sealing and calibration, name plate, inspection, tests, packing, marking, and warranty.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specifications CAA-177. Airway Traffic Control Relay Racks.

References.—Track signals, *see* 718.40, 718.41, 718.42; industrial controllers and testing, *see* 714.11; definitions, symbols, voltage and rating standards, methods of test, safety codes, *see* 710; power transmission and distribution relays, *see* 714.14.

718.44 Emergency Signals

References.—Track torpedoes and fusees, *see* 863; signaling flags, *see* 306.4.

718.49 Miscellaneous Railway Signals

American Transit Assn. Recommended Specification for Bonding for Surface Lines, D122-37; 1937. Includes capacity of bonds, number of bonds per joint, selection of bonds, type of bonds, cross connections, and testing.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 9-b-43; 1943. Specifications for Welded Type Rail Head U-Bonds and Extended Bonds. Gives purpose, drawings, tender, alternates, material and workmanship, design, conductors, terminals, identification, resistance of installed bonds, purchaser's order requirements, inspection, tests, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Insulated Rail Joints. Conforming to design, condition of rail, renewal, drainage, welding requirements, tightening of bolts, and bearing.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1942. Protection of Traffic Against Slides and Rock Falls. Includes requirements for detectors, circuit controller, train protection, and circuits.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1935. Signaling for

Gravity Classification Yards. Color light signal indications for yard and cab; for audible signals *see* Standard Code Rule 606.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Time Releases Applied to Signal Apparatus. Relation to breaking time, time distance relation, two block and three block apparatus, illustration, slow speed time interval, and tests.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 23-40; 1941. Channel Pins. For tinplated single groove and double groove pins for securing bond wires or rail connections into the rail; sizes, plating, and quality determinations.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 74-39; 1939. Impedance Bond. Details for a device to carry current around insulated rail joint, cast iron case, and marking thereof; test requirements, for signal service.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 104-39; 1939. Air-Cooled Reactor for Line and Track Circuits. Reactor for railway signal service; requirements as to design, voltage rating, current, and impedance, insulation test, surface leakage, and adjustment.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 128-39; 1939. Mechanical Time Release. Device for introducing a time interval in the control of signal and switch circuits and levers of interlocking machines. Design of contacts, applications, and dielectric requirements.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 135-42; 1943. Track Circuit Rail Bonding. For the purpose of providing bonding of railway signaling track circuits where rails do not carry return propulsion current. Covers drawings, tender, alternates, material and workmanship, general requirements, bonding, purchaser's order requirements, inspection, and tests.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 151-42; 1943. Plug Type Rail Bonds and Track Circuit Connectors. For providing plug type rail bonds and track circuit connectors for track circuits where rails do not carry return propulsion current. Covers drawings, material and workmanship, design, conductors, terminals, welding, tinning and galvanizing, elongation, identification, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 178-42; 1943. Welded Type Rail Head Bonds and Track Circuit Connectors. For providing welded type rail head bonds and track circuit connectors for track circuits where rails do not carry return propulsion current. Covers drawings, material and workmanship, design, conductors, terminals, galvanizing and tinning, elongation, identification, resistance to installed bonds, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 179-42; 1943. Mechanically Applied Rail Head Type Bonds and Track Circuit Connectors. For providing mechanically applied rail head type bonds and track circuit connectors for track circuits where rails do not carry return propulsion current. Covers drawings, material and workmanship, design, conductors, terminals, plating and tinning, identification, resistance of installed bonds, inspection, tests, packing, marking, and warranty.

References.—Petrolatum for impedance bonds, *see* 504.6; methods of electrical testing, *see* 710; methods of testing and general requirements for metals, *see* 600.1; approach, warning, and engineman signs, *see* 998; bonding wire, copper, *see* 715.44; bonding wire, steel, *see* 715.43.

718.5 TRAFFIC AND HIGHWAY SIGNALS

American Assn. of State Highway Officials, Institute of Traffic Engineers, and National Conference on Street and Highway Safety. Prepared with advice and assistance of the War Dept. and Office of Civilian Defense. Manual on Uniform Traffic Control Devices for Streets and Highway, War Emergency Edition, 1942. Covers definitions, classification, legal authority, application, design, location and installation, and maintenance of signs, markings, and signals. Also covers safety zones and traffic islands.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specification for Highway Crossing Signs and Signals. Railroad advance warning signs should be installed and maintained by the highway authorities. This specification covers flashing light type and wig-wag type of signals and gives drawings and details for the same.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specification for Suspended Overhead Highway Sign. May be used with or without reflecting units as conditions require. Gives drawings and details for these types of signals.

Assn. of American Railroads. Bulletin 3; 1942. American Standards Assn., D 8.1-1943. Railroad Highway Grade Crossing Protection. Recommended standards and practices for new installation of railroad-highway grade crossing signs, signals, and automatic gates. Drawings for grade crossing signs, flashing light type and wig-wag type signals, automatic gates, and auxiliary signs.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1942. Automatic Highway

Grade Crossing Protective Systems. Gives general instructions, inspections and tests, and performance report.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1943. Highway Grade Crossing Signals. Electrically or mechanically operated signal used for the protection of highway traffic at railroad-highway grade crossings, consisting of a swinging red light or swinging disc. Details for flashing light type and wig-wag type. Covers mounting, operating time, circuits, bell, lights, lenses, range and spread, and flashes or cycles.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1929. Train Approach Signals. Recommendation 67 in 1929 report of the committee of American Engineering Council on street traffic signs, signals and markings—swinging red light and target, or two flashing red lights in horizontal line.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 44-39; 1939. Direct Current Vibrating Highway Crossing Bell. 12-in. diameter, gong type, design details, coils, contacts, calibration, and tests.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 155-42; 1943. Railroad-Highway Grade Crossing Signs. For the purpose of providing signs of various designs for railroad-highway grade crossing protection. Covers drawings, material and workmanship, types, gray iron castings, sheet metal, reflector units, designs and assembly sheet metal signs, painting, synthetic enamel finish, vitreous enamel finish, identification, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 156-40; 1941. Reflector Unit. Sign for highway grade crossing protection, for new installation or replacement. Single and double refraction types of glass covered, silvered reflectors, tests for shock, solarization, corrosion and seal.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 176-41; 1944. Highway Grade Crossing Signals. Includes requirements for track to be signaled (single, double, or multiple track); power supply, distributing system (aerial, surface, underground), foundations, signals, trunking, conduits and supports, wire and cables, instrument and battery housings, insulation, painting, bonding, and energy for operating signals, track circuits, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 190-42; 1943. Flashing Light Signal Lamp Unit. For highway crossing signal lamp unit of the alternately flashing light type. Requirements for lamp case, terminals and wiring, roundels, receptacle, reflector, tests, range and spread, hood, backgrounds, painting, phantom, binding posts, dielectric requirements, identification, inspection, tests, marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 199-42; 1943. Electric Motor Mechanism and Gate Arm for Highway Grade Crossing Signal. For providing gates as an adjunct to A.A.R. recommended crossing signals of the flashing light or wig-wag type. Covers gate arm, mechanism, gears, motor, hold-clear device, circuit controller, wiring, finish, dielectric requirements, identification, painting, inspection, tests, marking, and warranty.

Institute of Traffic Engineers. American Standards Assn., D 10.1—1942. Adjustable Face Traffic Control Signal Head Standards. Includes definitions of terms and requirements for position of traffic control indication, housing, doors, gasketing, traffic signal lenses, reflectors, tests and inspection, lamp receptacle, wiring, visors, trunnions and brackets, exterior finish, and method of mounting.

Institute of Traffic Engineers. Technical Report 2; 1943, National Electrical Manufacturers' Assn. American Standards Assn., D11.1-1943. Pre-Timed, Fixed Cycle, Traffic Signal Controllers. Covers purpose, definitions, scope, general design requirements, noninterconnected controllers, future interconnected controllers, interconnected controllers, and master controller.

International Municipal Signal Assn., Inc. Equipment Specification No. 101; 1942. Traffic Signal Standards. Covers details for traffic signal standards for use on underground municipal traffic signal systems. Gives requirements for general design, dimensions, pedestals, shafts, anchor rods, finish, workmanship, and inspection tests.

International Municipal Signal Assn., Inc. Equipment Specification 101-A; 1942. Specification for Traffic Signal Standard. Covers details for a traffic signal standard for use on underground municipal traffic signal systems. Gives requirements for general design, dimensions, shafts, base, anchor rods, finish, workmanship, and inspection tests.

National Conference on Uniform Traffic Accident Statistics, Committee on Definitions. Manual of Definitions of Motor Vehicle Accidents, 1942. Includes primary definitions and guiding examples and interpretations for motor-vehicle accident, motor vehicle, motor-vehicle traffic accident, traffic way, motor-vehicle accident death, motor-vehicle traffic accident death, place of accident, and property damage; and classifications of types of motor-vehicle traffic accidents and causes of death. Endorsed by U.S. Public Health Service, U. S. Bureau of Census, Division of Statistics Standards, U. S. Bureau of the Budget, and U. S. Public Roads Administration.

Underwriters' Laboratories, Inc. Standard for Direction Signal Systems for Automotive Vehicles, 1940. Turn indicators under control of operator, semaphore and stationary or flashing types. Requirements as to suitability, lamps and wiring, pilot indicator, color, legibility angles and sight distances. Also tests for vibration, moisture, dust, and corrosion.

Underwriters' Laboratories, Inc. Standard for Highway Emergency Signals, 1940. Traffic warning signals for commercial vehicles to be used in the event of enforced parking on a highway. Includes liquid-burning flares, red electric lanterns, and fusees. Design and construction, stability, instructions, and marking. Also vibration, shock, weatherproof qualities, reliability, and photometric tests.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-8. Approach Lights; Neon, Lamp.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-134. Course Light Units.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-154. Beacon; Airways, 24-Inch Rotating, Rigid Drum Type.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-202. Glide Path Receiver.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-218. Sock; Fabric, Wind-Cone, Internally Lighted.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-232. Beacon; 24-Inch, Rotating Dome Type.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-291. Beacons; 36-Inch, Rotating, Double Ended.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-342. Approach Light; Refilling Neon Lamp Tube.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-402. Glide Path; Localizer, Inner Marker Buildings.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-481. Airport Traffic Signals; Green and Fluorescent Lamps.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-485. Boundary Lights, for Alaskan Installation.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-500. Buoy Lights; Cable-Fed.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-504. Beacon; Spherical Reflector for 24-Inch Rotating.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-508. Portable Airport Traffic Signal.

718.6 RADIO APPARATUS AND EQUIPMENT

718.60 General Items

American Society for Testing Materials, B 128-42; 1942. Methods of Testing Sleeves and Tubing for Radio Tube Cathodes. For determination of dimensions and physical properties of seamed and seamless tubing; apparatus required, test specimen, and outline of procedures.

American Standards Assn., C 75.2-1943. Steatite Radio Insulators (American War Standard). For the purpose of facilitating production of steatite radio insulators. Gives applicable specifications and drawings, classification, material and workmanship, general and detail requirements, methods of inspection and tests, packaging, packing, marking for shipment, requirements applicable to individual government departments, definitions, drawings showing details, and appendix covering design criteria.

American Standards Assn., C 75.4-1943. Ceramic Radio Dielectric Materials, Class H (American War Standard). For the purpose of facilitating production, procurement, and inspection of ceramic radio dielectric materials. Gives applicable specifications, classification, materials, general and detail requirements, methods of test, packing, and marking of packages for shipment, requirements applicable to individual government departments, and notes.

American Standards Assn., C 75.6-1943. Glass-Bonded Mica Radio Insulators (American War Standard). For the purpose of facilitating production of glass-bonded mica radio insulators. Gives applicable specifications, classification, material and workmanship, general and detail requirements, methods of inspection, and tests; packaging, packing, marking for shipment; requirements applicable to individual government departments, notes, and appendix covering design criteria.

Assn. of American Railroads, Telegraph and Telephone Section, 12-1; 1932. Mitigation of Interference to Radio Reception From the Operation of Communication Equipment. Guide for investigation of source and nature of interference, choke coils and by-pass condensers, and re-radiation conditions, with diagrams.

Institute of Radio Engineers. Standards on Facsimile; Definitions of Terms, 1942. Includes definitions for terminal equipment, transmission, and general.

Institute of Radio Engineers. Standards on Radio Wave Propagation; Definitions of Terms, 1942. Includes definitions of terms relating to noise, ionosphere, and general.

Institute of Radio Engineers. Standards on Radio Wave Propagation; Measuring Methods, 1942. Covers the two basic methods (standard-antenna and standard-field), methods of measuring power radiated from an antenna, and methods of measuring noise field intensity.

National Electrical Manufacturers Assn., jointly with Edison Electric Institute and Radio Manufacturers Assn. Methods of Measuring Radio Noise, NEMA 107; 1940. Covers electrical disturbance which excites radio receiver in such a way as to produce acoustic noise, specifications for 150 to 18,000 k-c radio noise meter, measurement of radio noise-influence voltage, radio noise field intensities, and at radio receiving location. Also suggested forms for data sheets, and instructions for reporting radio noise measurements.

National Electrical Manufacturers Assn., Edison Electric Institute, and Radio Manufacturers Assn. Radio Interference, 1933. General discussion of the problem of interference to radio broadcasting. Covers introduction, radio broadcasting, radio interference, legislation, radio coordination, and summary.

Radio Manufacturers Assn. Frequency Modulation Transmitters, M7-211 and M7-212; 1942. Standards for pre-emphasis and polarization of frequency modulation transmission.

Radio Manufacturers Assn. Standards, 1941. Gives terms and definitions, methods of test for cords, plugs and jacks, voltage breakdown test, soldering test for terminals; insulation and electrolysis test for audio transformers, voltage test for fixed paper capacitors, testing for dry cell A batteries, B batteries and C batteries; design and rating of socket power devices and electric radio receivers, color coding of antenna and ground leads, and standards for various parts. Also gives standard test signals, quieting signal input, deviation sensitivity, and definition of deviation.

Radio Manufacturers Assn. Transmission and Reception Data, 1932. Includes theory of wave propagation, distance ranges of radio waves, and charts of ranges for day and night operation. Reprinted from National Bureau of Standards LC 317-1932.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-100a; 1944. Catalogs; Radio and Radar Equipment Spare Parts.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-19a; 1944. Handbooks; Radio and Radar Equipment Operating.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-20a; 1944. Handbooks: Radio and Radar Equipment Maintenance.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-21a; 1944. Handbooks and Catalogs; Radio and Radar Equipment (General Specification for Printing of).

U. S. Gov., Army-Navy Aeronautical Specification AN-I-24; 1944. Interference Limits; Aircraft Radio.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Radios; All Kinds.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-455. Test Requirements, MRL-ML Radio Range and Telephone Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-466. Artificial Line; Radio Frequency, To Be Used With Emergency Cable.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C74; 1937. Radio Instruments and Measurements. A 345 page book covering introduction, fundamentals of electromagnetism, principles of alternating currents, radio circuits, damping, wave meters, condensers, coils, current measurement, resistance measurement, sources of high-frequency current, calculation of capacity, design of inductance coils, high-frequency resistance, miscellaneous formulas and data, and appendices.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H35; 1939. American Standards Assn., C2.5-1940. Safety Rules for Radio Installations (Comprising Part 5 of the Fifth Edition, National Electrical Safety Code). Requirements on location, installation, and guarding of antenna and counterpoise, material, and size of lead-in, type of construction at entrance to building, type and size of grounding conductor and ground, protective devices, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP77; 1929. A Course-Shift Indicator for the Double-Modulation Type Radiobeacon. The purpose of this beacon is to indicate to a station operator whether a given course as laid out in space remains unvarying during a given time of operation, and to greatly facilitate a check of the beacon calibration.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-964A; 1942. Radio Set SCR-197-( ); Components in Truck K-18-( ); Installation of.

718.61 Antennas and Equipment

Institute of Radio Engineers. Standards on Transmitters and Antennas, 1938. Includes classification, nomenclature, methods of measurement, and definitions of antenna systems used in transmitting and receiving; single-unit antenna resistance, reactance, angular height and effective height, radiation efficiency, and directional pattern; multi-unit antenna, test methods, rating, gain, impedance, frequency characteristics, three-dimensional directional pattern, load and breakdown tests, weather effects, signal to noise ratio test, and measurement of properties of waves.

Institute of Radio Engineers. Standards on Transmitters and Antennas; Methods of Testing, 1938. Includes methods of tests for power rating, spurious radiations, frequency stability, operational stability, amplitude modualtion, single-unit antenna, multi-unit antenna, and propagation of radio waves.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Radio Equipment. Not applicable to shipboard equipment. Minimum sizes and allowable materials for antenna, counterpoise, lead-in, and grounding conductors, clearance requirements, construction of lead-in bushings, location and operating characteristics of lightning arresters, grounding and grounding switch requirement.

Radio Manufacturers Assn. Definitions, M1-111 to M1-126, 1930; and M1-211, 1936. Terms relating to radio equipment and nomenclature of antenna parts.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-20. Antenna Tuning Unit.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways Specification CAA-23. Antenna; Phantom-Load Unit, Radio.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-64. Antenna; Tuning Unit.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-79. Antenna System for U.H.F. Radio Range.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-91. Antenna; Insulated, Heavy-Duty, Self-Supporting Towers for.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-92. Antenna System; Form 6 Tower, Erection of and Incidental Construction.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-93. Antenna System; Loop Erection of and Incidental Construction.

U. S. Gov., Dept, of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-130. Antenna System; Heavy-Duty Tower for, Erection of.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-233. Rods; Ground.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-261. Radio Range; U.H.F. Antenna System, Four Course.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-284. Airplane Radio Tuning Antenna Coil and Relay.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-295. Antenna and Transmission Line Fan Marker Radio Radiating System.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-467. Antenna; U.H.F., 5-Loop System (Horizontally Polarized).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-17-A; 1927. Counterpoise; Type CP-3.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-220; 1925. Antenna; Type AN-15.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-224A; 1929. Antenna; Type AN-14.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-383C; 1932. Mast Section; Types MS-14 and MS-28, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-395A; 1934. Antenna; Type A-53, Artificial.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-405A; 1928. Counterpoise; Type CP-2.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-408A; 1929. Mast; Type MA-1, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-409; 1929. Ring; Type FT-74, Counterpoise.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-411; 1929. Antenna; Type AN-16.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-413; 1929. Counterpoise; Type CP-9.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-414A; 1929. Antenna; Types AN-8 and 8-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-505; 1931. Loop, Type LP-7, Radio Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-533B; 1941. Weight; Type WT-7-A, Aircraft, Antenna, Teardrop.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-596; 1931. Mast Plate; Type MP-11, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-597; 1931. Antenna; Type AN-17.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-600; 1931. Counterpoise; Type CO-10.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-601; 1931. Mast Section; Type MS-26, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-602; 1931. Mast Section; Type MS-27, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-614; 1931. Antenna; Type AN-19.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-615; 1931. Guy; Type GY-10, Radio Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-616; 1931. Counterpoise; Type CP-11.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-617A; 1943. Spreader; A-19 and A-20.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-648A; 1933. Mast Section, Types MS-29 to MS-33, Inclusive; Connector, Type M-131; and Mast Base, Type MP-12, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-675; 1933. Mast Sections; Types MS-34 to MS-41 Inclusive, for Steel-Rod Antennas, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-699C; 1943. Mast Sections MS-49, MS-50, MS-51, MS-52, MS-53, MS-54, MS-55, MS-56; and Mast Bases MP-14, MP-37, MP-47-A, MP-48-A. and MP-57; for Steel-rod Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-709A; 1936. Antenna; Types AN-21-A to AN-24-A, Inclusive, and Types AN-25 to AN-28, Inclusive.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-713A; 1938. Guy; Types GY-21-A, GY-22-A, GY-23-A, and GY-24-A, Radio Mast.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-800-A; 1935. Fairlead; Type F-7, Airplane Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-832A; 1939. Weight; Type WT-9, Aircraft Antenna, Spherical.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-834A; 1938. Antenna; Type A-58, Phantom.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-924A; 1943. Mast Base MP-22-A; Radio Antenna.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-950B; 1940. Antenna; Components for Radio Set SCR-197-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1035; 1942. Antenna Equipment RC-63; Directional, Components for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1115; 1941. Fairlead; Type F-10.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1121A; 1943. Reel Control Boxes BC421, BC461, and BC-461-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1374A; 1943. Antennas AN-29-B, AN-29-C, AN-30-B, and AN-45-G.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1600A; 1943. Antenna A-27; Phantom.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1613; 1943. Antenna Equipment RC-219-( ); Antenna AN-78-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1631; 1943. Clamps MC-421, MC-422, MC-423, MC-424.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3100; 1944. Antenna Equipment RC-291; Components of.

References.—Symbols, definitions, installation, *see* 718.60; wire, *see* 715.44; safety codes, *see* 718.60.

718.62 Electron Tubes

Institute of Radio Engineers, Inc., sponsor. American Standards Assn., C16.2-1939. Standard Vacuum Tube Base and Socket Dimensions. Includes small vacuum tube base, terminal caps for small vacuum tubes, small 4-pin transmitting tube base, and large transmitting tube base and cap.

Institute of Radio Engineers. Standards on Electronics, 1938. Includes methods of testing vacuum tubes for general characteristics, vacuum tube coefficients, ionization and leakage currents, interelectrode capacitance, power output, and detection characteristics; of phototubes, and gives definitions of terms and symbols.

Radio Manufacturers Assn. Terminal Connections for Receiving Tube Types, 1941. Diagrammatic drawings showing vacuum tube basings and indicating terminal connection of such shielding as may be integral with the tube type for all 520 types of receiving tubes of record on Jan. 1, 1941.

Radio Manufacturers Assn. Vacuum Tubes, M8-046 to M8-070, 1940; M8-071 to M8-082, 1938; M8-125 to M8-127, 1941; M8-130, 1941; M8-141, M8-151, and M8-161, 1939; M8-210 to M8-213, 1940; M8-251, 1936; M8-308 to M8-315, 1940; and M8-401 to M8-403, 1939. Gives tube base dimensions for various types of pin arrangements, type designations, grid nomenclature, terminal caps receiving and transmitting tubes, metal vacuum tube shells, receiving tube ratings, filament and heater ratings, vacuum tube bulb dimensions, measurement of interelement capacitances shields; definitions, type designations, focusing and deflecting systems for picture tubes.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-119. Vacuum Tube; Type 805.

U. S. Gov., Navy Dept. Specification 17T21a; 1944. Tubes; Electron, Power Types.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-176A; 1925. Tube; Type VT-1, Radio Receiving.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-178; 1924. Tube; Type VT-5, Radio Receiving.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-382A; 1932. Tube; Type VT-2, Radio Transmitting.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-547C; 1936. Tube; Type VT-24, Radio Receiving.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-786; 1937. Tube; Type VT-86, Radio Receiving, R.M.A., Type 6K7.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1208; 1942. Tube; Type VT-108, Radio Transmitting, Eimac 450th, or Equal.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1247; 1941. Tube; Type VT-147; Radio Receiving, R.M.A. Type 1A7GT.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1266; 1943. Tube VT-166 (Rectifier).

U.S. Gov., U. S. Army, Signal Corps. Specification 71-1408; 1943. Tube VT-208; Radio Receiving, R.M.A., Type 7B8.

U.S. Gov., U. S. Army, Signal Corps. Specification 71-1494; 1943. Tube; R.M.A., Type 12SN7-GT, Radio Receiving.

References.—Definitions, symbols, *see* 718.60; tube sockets, *see* 718.69.

718.63 Radio Transmitting Apparatus

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No.45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Radio Communication Equipment. Technical requirements as to location, power supply, operators' quarters, transmitters and receivers in accordance with Federal Communications Commission regulations, antenna material and construction, rigging, radio-phone, and spare parts.

Institute of Radio Engineers. American Standards Assn., C 16.5-1942. Recommended Practice for Volume Measurements of Electrical Speech and Program Waves. The instrument described in this recommended practice was developed specifically for broadcasting and the telephone plant which provides the interconnecting service among broadcast stations. Covers definitions, volume indicator, and good engineering practice.

Institute of Radio Engineers. Standards on Transmitters and Antennas, 1938. Gives definitions of terms, graphical symbols, methods of testing power rating, spurious radiations, frequency stability, operational stability, and amplitude modulation and phase or frequency modulation. Also methods of testing single-unit, multi-unit antenna, and of measurement of properties of waves.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-5. Constant Output Amplifier.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-11. Airport Traffic Control; U.H.F., Transmitter Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-76. Radio Range U.H.F. Dual Transmitter.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-109. Radio Range and Telephone Transmitter; 133-Watt, for Loop Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-139. Amplifier-Rectifier Unit, for Transoceanic Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-140. Amplifier-Audio; General Purpose, for Transoceanic Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-149. Amplifier; Calibrated, for Transoceanic Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-150. Tone-Keyer; Polar Operating Locking, Single Channel.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-189. Transmitter Assembly; Radio, H.F., for Pacific Island Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-213. Telegraph Transmitter; Radio, Intermediate Frequency.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-244. Transmitter; Radio, Frequency-Modulated.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-258. Alaska, H.F. Radio Transmitter.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-262. Radio-Telegraph Communication Transmitter.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-300. Alarm-Control Unit, for Radio Transmission Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-312. Simultaneous Radio Range and Teletype Transmitter.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-362. Crystals; Quartz Plates; for Radio Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-363. Crystal Holder; Rectangular Quartz Plates, Special for Transmitters.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-371. Transmitter; U.H.F., 128 to 132 Megacycles.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-429. Transmitting and Receiving Equipment; U.H.F. Frequency-Modulated.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification. CAA-453. Keyer-Oscillator; Radio Teletype Transmitting.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-456. Transmitter; Radio, 150-Watt.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-502. Transmitter Assembly; U.H.F. Radio, Multi-Unit.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-510. Telegraph Communication, 10 Kw. Radio, Transmitter.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-515. Desk-Type, Moving Coil Microphone.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-516. Telegraph Communication. Low Frequency Radio Transmitter.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-518. Crystal.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-14-H; 1930. Radio Receiver and Transmitter; Type BC-7.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-38-E; 1928. Radio Transmitter; Type BC-86-B.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-53-1; 1929. Radio Transmitter; Type BC-114.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-55-F; 1929. Radio Control Box; Type BC-119.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-187C; 1930. Regulator; Voltage, Type MC-62, for Radio Transmitters.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-190B; 1930. Transmitter; Type T-11, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-193E; 1930. Radio Transmitter; Type BC-127.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-206; 1924. Radio Transmitter; Type BC-129.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-238-A; 1925. Key J-12.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-375A; 1931. Transmitter; Type T-12, Microphone, Used With Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-391C; 1928. Radio; Transmitter, Type BC-122.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-504A; 1935. Radio Receiver and Transmitter; Type BC-148.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-527A; 1940. Radio Receiver and Transmitter; Type BC-156.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-528A; 1940. Radio Receiver and Transmitter; Type BC-151.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-564; 1930. Radio Transmitter; 10-Kw.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-576C; 1935. Radio Transmitter; Type BC-176A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-582; 1931. Radio Receiver and Transmitter; Type BC-157.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-656B; 1942. Radio Transmitter BC-187-A; Radio Modulator BC-188-A; and Associated Vacuum Tube.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-693; 1935. Chest; Type CH-27, Carrying, Radio Transmitter.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-813A; 1939. Radio Transmitting Components for Radio Set, Type SCR-( )-183; and Radio Receiving Components for Radio Sets, Types SCR-( )-183, SCR-( )185, and SCR-( )-187.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-816; 1935. Radio Transmitter, Type BC-( )-191; and Associated Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-838A; 1939. Radio Transmitter; Type BC-302, Marker Beacon.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-842A; 1939. Radio Transmitter; Type BC-307-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-843B; 1939. Radio Transmitter; Types BC-191-( ); and Associated Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-870; 1938. Radio Transmitter, Type BC-337-( ); and Associated Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-873; 1939. Coil Set; Type C-182 and C-184, Transmitting, Crystal Control.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-887; 1939. Radio Transmitter, Type BC-375-( ); and Associated Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-905A; 1940. Radio Transmitter; Type BC-228A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-917A; 1938. Radio Receiver and Transmitter; Type BC-222.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-918A; 1938. Radio Receiver and Transmitter; Type BC-322.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-946A; 1939. Radio Set; Type SCR-197-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-947A; 1939. Radio Transmitter; Type BC-325-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-955B; 1941. Radio Transmitter BC-223-A; Transmitter Tuning Units TU-17-B, TU-18-B, and TU-25-A; and Case CS-56.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1131; 1942. Radio Transmitter BC-467-( ); and Associated Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1149; 1942. Radio Receiving and Transmitting Equipment RC-118-( ); Receiving and Transmitting for 2-Way Voice Communication; for Installation in 1/2-ton Commercial Truck.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1186; 1943. Crystal Unit DC-11-( ); Receiving and Transmitting.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1314; 1944. Radio Transmitter BC-653-( ), (Amplitude Modulated); Radio Receiver BC-652-( ), (Amplitude Modulated); and Associated Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1373; 1943. Radio Set SCR-511-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1683-A; 1944. Radio Sets SCR-399-( ) and SCR-499-( ); Components for.

References.—Symbols, definitions, installation, transmission unit, frequency calibration, safety code, *see* 718.60; radio fixed condensers, *see* 713.1; inductors, power transformers, *see* 713.1; inductors, power transformers, *see* 713.6, 713.5; laminated insulating materials, *see* 719.58; antenna, tubes, wave meters, *see* 718.61, 718.62, 718.65; safety codes, *see* 718.60.

718.64 Radio Receiving Apparatus

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No. 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Radio Communication Equipment. Technical requirements as to location, power supply, operators' quarters, transmitters and receivers in accordance with Federal Communications Commission regulations, antenna material and construction, rigging, radio-phone, and spare parts.

American Standards Assn., C 16.6-1943. Fixed Paper-Dielectric Capacitors (Home Receiver Replacement Type) (American War Standard). Covers the basic requirements applicable to fixed paper-dielectric capacitors suitable for use as replacement parts in home radio receivers. Gives material and workmanship, detail requirements, and standard capacitances, working voltages, and part numbers.

American Standards Assn., C 16.7-1943. Dry Electrolytic Capacitors (Home Receiver Replacement Type) (American War Standard). Covers the basic requirements applicable to dry electrolytic capacitors suitable for use as replacement parts in home radio receivers. Gives material, workmanship, design, detail requirements, standard capacitance, working voltages, and part numbers.

American Standards Assn., C 16.8-1943. Simplified List of Home Radio Replacement Parts (Paper and Electrolytic Capacitors, Volume Controls, Power and Audio Transformers, and Reactors) (American War Standard). This standard covers only the electrical values of the listed parts and deems these values adequate for maintaining in operation the great majority of home radio receivers. Covers fixed paper-dielectric capacitors, dry electrolytic capacitors, volume controls, and transformers and chokes.

American Standards Assn., C 16.9-1943. Power and Audio Transformers and Reactors. (Home Receiver Replacement Type) (American War Standard). Covers the basic requirements applicable to power and audio transformers and reactors suitable as replacement parts in home radio receivers. Gives material and workmanship, detail requirements—construction, detail requirements—electrical, detail requirements—humidity resistance, standard units, ratings, and part numbers.

American Standards Assn., C 16.10-1943. Volume Controls (Home Receiver Replacement Type) (American War Standard). Covers the basic requirements applicable to composition and wire-wound element variable resistors suitable for use as replacement volume controls in home radio receivers. Gives material and workmanship, detail requirements, standard units, rating, and part numbers.

Institute of Radio Engineers. Standards on Electro-Acoustics, 1938. Includes methods of testing loud speakers for response-frequency, sound-pressure, directional, impedance-frequency, distortion-frequency, and efficiency-frequency characteristics; definitions of terms and graphical symbols.

Institute of Radio Engineers. Standards on Radio Receivers; Definitions of Terms, 1938. Includes definitions of amplification, modulation, rectification; circuits, circuit elements, receivers, auxiliary equipment, and general.

Institute of Radio Engineers. Standards on Radio Receivers; Methods of Testing Broadcast Radio Receivers, 1938. Includes definitions of terms, requirements for apparatus, characteristics of measuring instruments, requirements for standard-signal generators for two-signal tests, and test procedures.

Institute of Radio Engineers. Standards on Radio Receivers, 1938. This standard covers definitions, graphical symbols, and methods of testing broadcast radio receivers; requirements and characteristics of testing apparatus, and procedures for input and output measurements, operating conditions, adjustment, and performance, tests.

Institute of Radio Engineers, Inc., sponsor. American Standards Assn., C16.3-39; 1939. Manufacturing Standards Applying to Broadcast Receivers. Includes nomenclatures, frequency range, and voltage rating; antenna installation instructions; and requirements for terminals, on-off switches, rotary circuit switches, adjustable resistance units, resistors—color code, and panel lamps.

Radio Manufacturers Assn. Cabinet Information, 1930. Includes table and console models, suggested solid woods and veneers, construction of cabinet, matching of veneers, adhesives, moisture content, finishing, and packing.

Radio Manufacturers Assn. Radio Receivers, M3-111 to M3-115 and M3-121 to M3-129, 1932; M3-141 to M3-145, 1936; M3-161 to M3-163 and M3-165 to M3-167, 1939; M3-210, M3-211, M3-213, and M3-214, 1937; M3-215 to M3-217, 1939; M3-220 and M3-221, 1936; M3-251 and M3-252, 1933; M3-271, 1936; and M3-411 to M3-414, 1941. Includes definitions of terms relating to radio receivers, their types and parts, standard on and off positions for lever and push-pull switches, attachment of power cable, standard direction for rotation of controls, and drum type dials, provision for fuses, insulation of leads for external output devices, terminal markings, and voltage ratings and frequency range for automotive radio receivers.

Underwriters' Laboratories, Inc. Standard for Power-Operated Radio Receiving Appliances. American Standards Assn., C65.1-1942. Covers power-operated radio receiving appliances for noncommercial use, designed to be employed on interior wiring systems in accordance with the National Electrical Code. Gives requirements for enclosure, supply connections, insulating material, attachment-plug receptacles, lamp-holders, switches, fuses, capacitors, transformers, batteries, wiring, spacings, current-carrying live parts, power consumption, leakage current, temperature, dielectric strength, strain relief, abnormal operation, rating, and marking.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-2. Remote Radio Receiver.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-12. Automobile; 3-Band Radio Receiver in.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-13. Aircraft Receiver; U.H.F.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-82. Airways Communication Radio Receiver.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-105. Receiver, U.H.F.; Monitor Radio Receiver.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-114. Receiving Equipment; Point to Point Diversity.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-135. Diversity Receiving Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-188. Barnegat Transoceanic Radio Receiving Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-201. Receiver; U.H.F. Localizer.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-226. Receiver; Radio Communication.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-250. Receiver; Frequency-Modulation.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-271. Receiver; Radio Telephone, Remote Airport.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-275. Airways Communication Radio Receiver (Supersedes CAA-21).

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-279. Transceiver; Radio, U.H.F. Short Range, Portable, General Purpose.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-302. Microphone; Moving Coil, Permanent Magnet Type.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-323. Diversity Receivers; Telegraph or Voice-Modulated Signals.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-351. Aircraft receiver; U.H.F.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-431. Airport Traffic Control Receiver; U.H.F.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-482. Monitor Receiving Antenna.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-496. Amplifier; Audio (Line).

U. S. Gov., Joint Army-Navy Specification, JAN-C-16; 1944. Crystal Units CR-1 ( )/AR.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-14-H; 1930. Radio Receiver and Transmitter; Type BC-7.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-36-D; 1928. Radio Receiver; Type BC-98-B.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-57E; 1928. Amplifier; Type BC-116-A, Radio Receiving.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-58-D; 1928. Radio Tuner; Type BC-115, Receiving.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-188F; 1932. Radio Receiver; Type BC-131.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-189E; 1932. Amplifier; Type BC-118-A, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-214A; 1928. Radio Receiver; Type BC-137.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-401B; 1928. Radio Receiver; Type BC-144.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-465A; 1929. Radio Receiver; Type BC-( )-152.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-504A; 1935. Radio Receiver and Transmitter; Type BC-148.

U. S. Gov., U. S. Army, Signal Crops. Specification 71-527A; 1940. Radio Receiver and Transmitter; Type BC-156.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-528A; 1940. Radio Receiver and Transmitter; Type BC-151.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-577A; 1933. Radio Receiver; Type BC-175.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-582; 1931. Radio Receiver and Transmitter; Type BC-157.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-656B; 1942. Radio Transmitter BC-187-A; Radio Modulator BC-188-A; and Associated Vacuum Tube.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-657B; 1942. Radio Receiver BC-186; and Associated Vacuum Tube.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-662; 1936. Radio Receiver, Type BC-189; and Coil Sets, Types C-142 to C-152, Inclusive; and Coil Set, Type C-154.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-694A; 1938. Chest CH-31A; Carrying, Radio Receiver.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-813A; 1939. Radio Transmitting Components for Radio Set, Type SCR-( )-183; and Radio Receiving Components for Radio Sets, Types SCR-( )-183, SCR-( )-185, and SCR-( )-187.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-839C; 1939. Radio Receiver; Types BC-103 and BC-346, Marker Beacon.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-844; 1935. Coil Units, Types C-156 and C-157; Dual Coil Sets for Radio Receivers, Types BC-AA-179, BC-AB-199, BC-AD-199, BC-AD-219, and BC-AE-229.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-855; 1938. Radio Receiver; Types BC-224-( ), Aircraft.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-872A; 1942. Radio Receiver; Type BC-348-( ), Aircraft.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-904A; 1940. Radio Receiver; Type BC-227A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-906; 1936. Radio Receiver, Type BC-189-A; and Coil Sets, Types C-142-A to C-152-A, Inclusive.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-914B; 1943. Radio Receivers BC-312-( ) and BC-342-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-917A; 1938. Radio Receiver and Transmitter; Type BC-222.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-918A; 1938. Radio Receiver and Transmitter; Type BC-322.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-934B; 1943. Radio Receivers BC-314-( ) and BC-344-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-946A; 1939. Radio Set; Type SCR-197-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1053; 1943. Radio Set SCR-536-( ); and Test Equipment IE-17-( ); Principal Components for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1117; 1942. Radio Set SCR-277-( ); Principal Component of; Mobile Radio Range, 200-400 kc.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1149; 1942. Radio Receiving and Transmitting Equipment RC-118-( ); Receiving and Transmitting for 2-Way voice Communication; for Installation in 1/2-Ton Commercial Truck.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1156; 1942. Radio Set SCR-253-( ); Ground Station, Local and Remote Control.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1186; 1943. Crystal Unit DC-11-( ); Receiving and Transmitting.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1314; 1944. Radio Transmitter BC-653-( ), (Amplitude Modulated); Radio Receiver BC-652-( ) (Amplitude Modulated); and Associated Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1373; 1943. Radio Set SCR-511-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1523; 1943. Radio Receiver BC-779-( ), BC-794-( ), BC-1004-( ); Power Supply Units RA-74-( ), RA-84-( ), RA-94-( ); and Cabinet CH-104-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1641; 1944. Radio Receiver BC-969; Case CS-109; and Mounting FT-411-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1683-A; 1944. Radio Sets SCR-399-( ) and SCR-499-( ); Components for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1720; 1943. Crystal Unit DC-20, or FT-243 Alternate.

References.—Symbols, definitions, installation. safety code, *see* 718.60; methods of electrical testing, *see* 710; fixed radio condensers, *see* 713.1; inductors, *see* 713.6; radio, audio, and power transformers, *see* 713.5; dry cell, A, B, and C batteries, *see* 712.1; storage batteries, *see* 712.2; connection cords for head sets and loud speakers, *see* 715.42; pilot lamps for dials, *see* 716.14; laminated insulating materials, *see* 719.58; antenna, tubes, wave meters, *see* 718.61, 718.62, 718.65; socket power units, head sets, loud speakers, plugs, jacks, magnetic pick-ups, tube sockets, binding posts, *see* 718.69.

718.65 Radio Instruments and Testing Apparatus

Institute of Radio Engineers. American Standards Assn., C 16.5-1942. Recommended Practice for Volume Measurements of Electrical Speech and Program Waves. The instrument described in this recommended practice was developed specifically for broadcasting and the telephone plant which provides the interconnecting service among broadcast stations. Covers definitions, volume indicator, and good engineering practice.

National Electrical Manufacturers Assn., jointly with Edison Electric Institute, and Radio Manufacturers Assn. Methods of Measuring Radio Noise, NEMA 107; 1940. Covers electrical disturbance which excites radio receiver in such a way as to produce acoustic noise, specifications for 150 to 18,000 kc. radio noise meter, measurement of radio noise-influence voltage, radio noise field intensities, and at radio receiving location. Also suggested forms for data sheets, and instructions for reporting radio noise measurements.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-325. Radio-Telephone Equipment; Portable.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-349B; 1933. Coil; Type C-31-A, Induction.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-404A; 1928. Test Set; Type I-52, Tube Tester.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-419; 1927. Wavemeter; Type BC-40.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-578A; 1933. Radio Control Box; Type BC-177.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-810B; 1937. Test Set; Type I-56-( ), Universal Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-811D; 1943. Frequency Meter Set SCR-211-( ); Major Components for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-856; 1938. Test Set Type I-66; Components for Testing Marker Beacon Receiving Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-857A; 1938. Meter, Frequency, Type BC-313; and Case, Type CS-50.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-899A; 1942. Test Oscillator; Type BC-376.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-959B; 1942. Coil; Type C-125, Induction.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-960A; 1944. Coil; Type C-158, Holding Coil.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1029; 1942. Coil; Type C-281, Induction.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1053; 1943. Radio Set SCR-536-( ); and Test Equipment IE-17-( ); Principal Components for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1107A; 1941. Test Set; Type I-77-( ), Major Components of.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1142; 1942. Test Set I-100-( ); Component for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1150; 1942. Test Set I-103-( ); Transmitter Tuning.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1388; 1942. Meter Frequency Set I-129-( ); Absorption Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1607A; 1943. Adapter FT-384-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1670; 1943. Maintenance Equipment ME-73-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1685; 1943. Adapters M-394 and M-399.

References.—Meters for measurement of electrical quantities, *see* 714.3; frequency calibration, *see* 718.60.

718.66 Applications of Radio

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No.45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Radio Direction Finder (Radio Compass). Technical requirements as to perception and frequencies, rotating element and compensator, gyro compass repeater, location, installation, interference, calibration, and operation.

Radio Manufacturers Assn., Engineering Dept. Television System Standards, 1939. Definitions for channel width, television and sound carrier spacing, position of sound carrier, frame frequency, number of lines per frame, aspect ratio, percentage of television signal devoted to synchronization, method of transmission of black level, synchronizing, transmitter modulation capability, output rating, relative radiated power for picture and for sound, and transmitter amplitude characteristic.

Radio Manufacturers Assn. Television Facsimile, M9-111 to M9-125, 1938; M9-126 and M9-127, 1936; M9-151 to M9-158 and M9-201 to M9-211, 1939; M9-212 to M9-220, 1940; M9-241, M9-251, M9-261, and M9-271, 1939; and M9-301 to M9-307, 1942. Covers definitions and requirements for radio television as channel width, spacing, relation to sound carrier, polarity, frame frequency, number of lines per frame, aspect ratio, synchronizing, transmitter modulation capability and output rating, amplitude characteristic, scanning, channel designation, receiver frequencies and controls, synchronizing sensitivity, etc.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-849A; 1937. Compass; Radio, Type SCR-242-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-878; 1939. Radio Compass; Type SCR-273-( ), Dual Remote Control, 12-Volt.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-879; 1939. Radio Compass; Type SCR-263-( ), Dual Remote Control, 24-Volt.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1537; 1942. Radio Set SCR-503-( ); Direction Finding, Principal Components for.

References.—Radio receiving equipment, *see* 718.64; photo tubes, *see* 718.62.

718.69 Miscellaneous Radio Apparatus and Equipment

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No.45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Depth Sounding Equipment. Fathometers for three classes of service, including depth indicator, amplifier, control unit, sound producer and receiver, power supply, and recorder; location and installation.

Institute of Radio Engineers, American Standards Assn., C 16.4-1942. To outline briefly the apparatus which is now used for testing loudspeakers together with the procedure for obtaining the important characteristics which depict the performance of a loudspeaker. Covers the following tests—response-frequency characteristic, directional characteristic, normal-impedance characteristic, nonlinear-distortion characteristic, and efficiency-frequency characteristic.

Radio Manufacturers Assn. Binding Posts, M4-113; 1930. Covers binding posts for radio receiving sets, standard dimensions of cord tip openings and fastening screw locations to accommodate the standard pin type and cylindrical type of cord tip.

Radio Manufacturers Assn. Radio Plugs and Jacks, M4-117 to M4-121; 1930. Standard dimensions and tolerances for six sizes of plugs and seven sizes of jacks, polarity markings for jacks, required contact pressures for jacks of spring type, voltage test for breakdown and application of test.

Radio Manufacturers Assn. Vacuum Tube Socket Dimensions, M4-127 to M4-131; 1938. Gives standard dimensions and spacing of pin receptacles in sockets, and between centers of mounting holes for 4-pin, 5-pin, and 6-pin tube bases, also for options on 8-hole octal base tube sockets.

Radio Manufacturers Assn. High Frequency Cores, M4-751 to M4-760; 1941. Gives standards for five core sizes, tolerances, screw sizes, tests, requirements as to permeability, Q or figure of merit, and humidity tests.

Radio Manufacturers Assn. Electro-Dynamic Speakers, M5-110 to M5-112, 1938; M5-161 and M5-162, 1939; and M5-181, 1937. Standard method of designating speaker cone diameter, direct current resistance of voice coil in specifying electrical characteristics, mounting dimensions for nine standard sizes, color code for wiring, etc.

Radio Manufacturers Assn. Radio Headset M5-152; 1938. Standard method of marking for polarity.

Radio Manufacturers Assn. Phonograph Pickups M6-111 and M6-112; 1941. Standards for magnetic pick-up jack as to position of wiring, and use of telephone plug ground connection to plus side of standard R.M.A. plug.

Radio Manufacturers Assn. Microphones M6-121; 1939. For use of 5/8 in. American standard screw thread, 1/2 in. American standard pipe thread, or 1/8 in. American standard pipe thread in mounting microphones.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-4. Speech Amplifier.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-16. Coupling Unit; Radio, for Tower Type Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-18. Link-Circuit Relay.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-19. Keyer; Radio Range.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-24. Relay Racks; Shelf Assembly, Cabinet Type.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-25. Audio Equalizer; Control Line.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-26. Transformers and Reactors for Radio Equipment Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-27. Remote Control Equipment, for Radio Range Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-28. Simultaneous Radio Range and Telephone Equipment; Test Requirements.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-30. Radio Facilities; Types SMRA-D and SBRA-D, Installation, and Commissioning of Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-60. Impedance Measuring Unit.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-63. Coupling Unit; Radio, for Modernized Tower Type Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-73. Fan Marker Transmitter.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-77. Interlock, for U.H.F. Range System.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-78. Range Equipment and Material U.H.F. Installation of.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-81. Coupling Unit; Radio, for Tower Type Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-83. Radio Facility; Type SRA-D, Installation of Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-88. Simultaneous Radio Range and Telephone Equipment Test Requirements.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-110. Coupling Unit; Radio, for Loop Type Station, MRL-ML.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-116. Radio Facilities; Types MRL-D or ML-D, Installation, and Commissioning.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-124. Fan Marker; U.H.F., Installation.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-125. Motor-Generator-Alternator; Electric, 4-Unit, 8-Bearing, for U.H.F. Fan Marker.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-126. Fan Marker Equipment Instruction Books; U.H.F.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-127. Fan Marker Radiating System; U.H.F.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-132. Remote Control Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-141. Audio-Frequency Vacuum Tube Tone Generator.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-142. Filter; Electrical, Narrow Band Pass.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-145. Telegraph System; Tone Channel.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-151. Keying Unit; Vacuum Tube.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-163. Racks; Cabinet Type, Relay.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-166. Radio Board Assembly; 10 Circuit, for Teletype Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-196. Filter; Combination Band Pass and Rejection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-197. Audio-Frequency Monitor Unit.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-243. Filter; Combination Band Pass and Band Rejection.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-251. Keying Equipment; Remote.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-253. Filter; Band Pass and Low Pass.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-276. Remote Control Equipment, for Radio Range Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-278. Intensity Measuring Set for Radio Field.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-292. Fan Marker Frequency Changer Equipment; U.H.F.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-293. Fan Marker; U.H.F. Radio Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-294. Motor-Generator-Alternator Units; Electric, for Fan Marker Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-296. Fan Marker; Radio, Installation of.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-299. Rectifier; Copper-Oxide, for Strowger Switch Operation.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-313. Coupling Unit; Radio, for Tower Type Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-314. Line Amplifier Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-316. Attenuator; Standard Audio Frequency 100-5,000 C.P.S.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-320. Filter; Radio Band Elimination.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-361. Standard Remote Control Circuits for Airways Radio Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-363. Holder, for Quartz Plates of Radio Transmitters.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-419. Filter; Combination Band Pass and Band Rejection, Radio (Obsolete).

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-452. Radio Teletype Receiving Keyer.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-454. Radio Teletype Filters.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-455. Combination Amplifier-Loudspeaker.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-469. Radio Range 2-Pole Interlock Relay; U.H.F.

U. S. Gov., Joint Army-Navy Specification JAN-S-28; 1944. Sockets; Electron-Tube Miniature.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-40-C; 1927. Adapter; Type FT-65-B, for Vacuum-Tube Sockets.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-54-F; 1933. Motor Alternator, Type GN-( )-33; Tone Alternator, Component of Radio Sets.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-64-C; 1927. Post; Binding, Types TM-34, TM-72 to 75, and TM-78 to 83, for Telephone and Testing Apparatus.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-207; 1924. Radio Control Box; Type BC-130.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-215C; 1928. Radio Tuner; Type BC-138.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-316; 1925. Aerophone; Type N-97.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-400C; 1927. Radio Control Box; Type BC-142.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-494A; 1941. Headset; Types P-16, P-18, P-19, and P-20.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-580A; 1933. Box; Type BX-2, Radio Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-695; 1936. Radio Control Box; Type BC-206.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-697A; 1936. Radio Control Box; Type BC-214-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-723; 1935. Fuse Box; Type BX-10, Radio Set High Voltage Supply.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-819C; 1938. Microphone; Type T-17, Radio, Hand.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-821; 1935. Oscillator Equipment RC-12 (Radio, 150 to 13,000 KCS).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-822A; 1936. Fuse Box; Type BX-11, High Voltage, for Aircraft Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-833; 1935. Radio Control Box; Type BC-215, for Aircraft Radio Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-848E; 1940. Amplifier; Interphone, Type BC-212-C, Aircraft, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-850C; 1941. Microphone, Type T-20-( ), Throat; and Microphone Amplifying Equipment, Type RC-19-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-852C; 1940. Jack; Types JK-26, JK-33A, JK-34A, and JK-46A, Receiver and Microphone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-866A; 1940. Filter; Radio, Type FL-5-( ), Audio-Frequency.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-877B; 1942. Amplifier; Interphone BC-347-C, Aircraft Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-897; 1940. Loudspeaker, Type LS-4; and Loudspeaker, Type LS-5.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-902; 1936. Frame; Type FM-18, Radio Pack.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-903A; 1940. Radio Control Box; Type BC-235A.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-913A; 1937. Headset; Type HS-16-A, Receiving.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-915; 1936. Radio Set; Type SCR-206-( ), Components for, Direction Finding.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-921; 1937. Adapter; Type SO-52, Radio Connecting.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-938A; 1938. Headset; Type HS-22-( ), Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-939; 1938. Handset; Type TS-11-( ), Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-940; 1937. Microphone; Type T-24-( ), Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-944A; 1939. Interrupter; Type BZ-7-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-949A; 1940. Control Unit, Type RM-7-( ); and Monitor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-962A; 1942. Power Equipment, for Radio Set SCR-197-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-969; 1939. Holder; Type M-167, Radio Log Sheet.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-972; 1939. Control Box; Type BC-321.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-975A; 1942. Holder, Crystal, Type FT-171-B, With Crystal; Piezo Electric Quartz Crystal and Holder, 2,000-5, 250-Kilocycles.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-987; 1940. Remote-Control Equipment; Type RC-47.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1034; 1942. Remote Control Unit RM-14; and Associated Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1049; 1942. Filter FL-10.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1058; 1942. Handset; Type TS-13-( ), Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1059; 1942. Headset P-23.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1122A; 1942. Filter; Radio, Type FL-8-( ), Audio-Frequency.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1123; 1941. Tuning Shaft MC-215; Parts and Complete Assembly.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1140; 1941. Cushion MC-162-A, for Receiver R-14.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1147; 1942. Indicator BC-727.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1319; 1942. Remote Control Unit RM-29-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1355A; 1943. Crystal Unit DC-9-AJ.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1360; 1942. Holder, Crystal FT-243 with Crystal; Piezo Electric Quartz Crystal and Holder.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1370A; 1944. Maintenance Equipment ME-13-( ); Components for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1624; 1943. Maintenance Equipment ME-40-( ); Principal Components for Maintenance of Radio Set SCR-300-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1626; 1943. Crystal Unit DC-18-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1672; 1943. Dehydrator Cabinet CH-169-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1729; 1943. Microphone Adapter M-299.

U. S. Gov., Veterans Administration. Specification VA-M-329; 1943. Radio Attachment Plugs.

U. S. Gov., Veterans Administration. Specification VA-MC-177d; 1940. Radio Headsets Complete With Cords.

References.—Telephone plugs and jacks, *see* 718.29.

718.7 SOUND RECORDING AND REPRODUCING APPARATUS

Acoustical Society of America, sponsor. American Standards Assn., Z 24.2-1942. Noise Measurement. Define numerical scales and other essentials for measuring the loudness and intensity of sounds. Gives definitions, standards for noise measurement, standards for loudness contours and scale of loudness, and appendix.

Acoustical Society of America, sponsor. American Standards Assn., Z24.3-1944. Sound Level Meters for Measurement of Noise and Other Sounds. For obtaining results which will approximate the loudness level obtained by the more elaborate ear-balance method. Covers purpose and definitions, and appendices cover response-frequency characteristics of sound level meters, tests for root mean square addition, calibration adjustment of individual sound level meter, tolerances in response-frequency characteristic, and correction of reading on specific noises.

Acoustical Society of America, sponsor. American Standards Assn., Z 24.4-1938. Recommended Practice for the Calibration of Microphones. Comprises a part of a group of definitions, standards and specifications for use in acoustial work. Purposes are three-fold—(1) to assist the National Bureau of Standards in establishing calibrating apparatus for microphones and related acoustical apparatus; (2) to assist in obtaining agreement between different laboratories engaged in the work of calibration pending the availability of the Bureau's equipment; and (3) to further the general knowledge of this subject.

American Institute of Electrical Engineers, No.520; 1939. Test Code for Apparatus Noise Measurement. Sound level tests on apparatus, general considerations, room effects, ambient sound levels, sound level meter in accordance with A.S.A. Tentative Standard Z24.3, standard factory measurement tests, and procedure for field investigations.

American Medical Assn. Council on Physical Medicine. Minimum Requirements for Acceptable Audiometers, 1942. Gives requirements for frequencies, attenuation, range, wave form, extraneous noises, power supply, ruggedness of construction, uniformity of calibration, standard for reference, audiogram or auditory chart, definition of threshold of hearing, and marketing and advertising.

American Medical Assn. Council on Physical Medicine. Minimum Requirements for Acceptable Electric Hearing aids, 1943. Hearing aid shall improve at least 30 decibels for speech the hearing of the deafened ear for which it is prescribed or fitted. Gives detailed requirements.

Radio Manufacturers Assn. Amplifier Power Ratings, M6-221; 1941. Requirements for least power voltage at harmonic frequencies and maximum power output regardless of distortion. Gives standard test conditions for sound equipment.

U. S. Gov., Army Air Forces. Specification 40704-2; 1944. Recorder and Reproducer; Sound, Magnetic Tape Type.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-7; 1944. Noise-Measuring Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-305. Recorder, for Voice and Permanent Recording Medium.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-505. Recording Surfaces, for Voice Recorders.

U. S. Gov., Navy Dept. Specification 17M18a; 1944. Machines and Equipment; Sound Motion Pictures, 35-Mm. (Shipboard Use).

U. S. Gov., Navy Dept. Specification 17M19a; 1944. Machines and Equipment; Sound Motion Picture, 35-Mm.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-246; 1924. Ground Listening Set; Type GR-1, Formerly Geophone, Sound Ranging.

References.—Magnetic pick-up, *see* 718.69; motion picture projectors, *see* 912.

719. MISCELLANEOUS ELECTRICAL APPARATUS

719.1 AUXILIARY ELECTRICAL EQUIPMENT

U. S. Gov., U. S. Army, Signal Corps. Specification 74-29; 1939. Register; Type ML-103-( ).

References.—Auxiliary motors for ships, *see* 711.21, 711.22.

719.3 MAGNETOS

Society of Automotive Engineers. Aeronautical Standard No.12; 1941. Mountings for Aircraft Magnetos. Covers three types of flanges for magneto mountings—(1) two-bolt, (2) three-bolt, and (3) four-bolt. Gives requirements for material, workmanship, and design; and includes diagrammatic dimensional drawings.

Society of Automotive Engineers. Aeronautical Standard No.13; 1941. Drives for Aircraft Magnetos. Covers two types of drive couplings—(1) 17-tooth and (2) 33-tooth; and three types of shaft ends—(1) tapered, (2) 6-tooth spline, and (3) 24-tooth spline. Gives general requirements, coupling design, and shaft end design; and includes dimensional diagrammatic drawings.

Society of Automotive Engineers. Aeronautical Standard No.14; 1941. Installation of Aircraft Magnetos. Gives requirements for type disignations, blast tube, outlet elbow, radio interference, ground and high tension terminal connections, and supercharging (or forced ventilating) connections; and includes diagrammatic dimensional drawings.

Society of Automotive Engineers. Aeronautical Standard No.15; 1941. Tests for Aircraft Magnetos. Given for general information and is not to be considered as part of other aeronautical standards or specifications for magnetos. These tests provide for a standard method of checking whether a magneto is performing in a normal acceptable manner and whether it is fit for further use. Includes requirements for visual inspection of magneto housing, drive shaft, spline or coupling, gears, breaker point assembly, timing, distribution finger and blocks; and for tests of coil and condenser, conditioning at room temperature, coming-in speed, primary current, and voltage.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-4-2; 1944. Magnetos; Aircraft Engine Driven.

719.4 SPARK PLUGS

Society of Automotive Engineers. Aeronautical Recommended Practice 159; 1943. Quench Bomb Spark Plug Test. This test is considered applicable where more comprehensive information about the condition of the spark plug is desired than is available through a conventional sparking bomb test. Covers general requirements, preparation for test, conduct of test, precautions, and description of parts.

Society of Automotive Engineers. Aeronautical Standard 9A; 1943. Protector and Cable Attachment. Spark Plug Terminal; Aircraft Engine. Diagrammatic dimensional drawing for types I and II.

Society of Automotive Engineers. Aeronautical Standard No.28; 1942. Spark Plugs; Aircraft Engine—18 Mm. Covers two types—(I) ceramic insulated; (II) mica insulated; of three categories each—shielded long reach, shielded short reach, and unshielded short reach. Includes general and specific requirements, qualification tests, inspection tests, and diagrammatic dimensional drawings.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-4-4; 1944. Plugs; Aircraft Engine, Spark.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-67; 1945. Plugs; 14 Mm, Spark.

U. S. Gov., Federal Specification W-P-506; 1936. Plugs; Spark. Covers unshielded spark plugs with insulators of material other than mica for all internal-combustion engines requiring electric ignition, except aircraft engines. Four classes—hot, normal, cold, and very cold. Gives requirements for type designation, sizes, suitability for service, construction and dimensions, shells, bushing, terminal nut, porcelain insulators, threads, and gaskets; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 17P1d; 1934. Plugs; Spark.

719.5 ELECTRICAL INSULATING MATERIALS

719.50 General Items

American Society for Testing Materials, D 48-43 T; 1943. American Standards Assn., C 59.1-1943. Tentative Methods of Testing Molded Materials Used for Electrical Insulation. Apply to the testing of all solid electrical insulating materials (except dry process porcelain) that are formed in molds by the application of pressure, either with or without heat. Acetone extraction, arc-resistance, compressive strength, dielectric strength, deformation under load, distortion under heat, flexural strength, resistance to impact, insulation and volume resistance, power tests, power factor and dielectric constant, shrinkage from mold dimensions, tensile strength, and water absorption.

American Society for Testing Materials, D 149-44; 1944. Methods of Test for Dielectric Strength of Electrical Insulating Materials at Commercial Power Frequencies. For solid, semisolid, and liquid materials, except where a specific material requires special treatment. Covers purpose, apparatus, electrodes, test specimen, conditioning, application of voltage, report, and description of a simple form of motor-operated variable auto-transformer.

American Society for Testing Materials, D 150-44 T; 1944. Tentative Methods of Test for Power Factor and Dielectric Constant of Electrical Insulating Materials. Procedures for the determination of the power factor and dielectric constant of solid and fluid electrical insulating materials at frequencies from 25 cycles per second to 100 megacycles per second. These procedures include five bridge arrangements, and two resonant-circuit methods. Definitions, theory of test, test specimens, electrodes, apparatus and procedure, formulas, and bibliography.

American Society for Testing Materials, D 176-44; 1944. Methods of Testing Solid Filling and Treating Compounds Used for Electrical Insulation. Apparatus and test procedure for brittleness, specific gravity, coefficient of expansion, dielectric strength, volume resistance-temperature characteristics, power factor and dielectric constant, degassing compounds, and tests using A.S.T.M. Methods D 127 for melting point, D 61 for softening point, D 92 for flash point, D 6 for evaporation, D 88 for viscosity, and D 5 for penetration.

American Society for Testing Materials, D178-24; 1924. American Standards Assn., C59.4-1935. Rubber Matting for Use Around Electrical Apparatus or Circuits Not Exceeding 3,000 Volts to Ground. Construction, tensile strength and elongation requirements, test requirements for voltage and dielectric strength tests, and minimum thickness.

American Society for Testing Materials, D 229-43; 1943. American Standards Assn., C 59.13-1943. Methods of Testing Sheet and Plate Materials Used in Electrical Insulation. For phenolic and other types of laminated sheets, vulcanized fiber, hard rubber, asbestos composition board, etc. Covers definitions, conditioning, thickness; tensile, flexural, and compressive strength; resistance to impact, water absorption, volatile matter, dielectric strength, power factor and dielectric constant, bonding strength, Rockwell hardness, ash, flammability; and test specimen and procedures.

American Society for Testing Materials, D 257-38; 1938. American Standards Assn., C59.3-1939. Methods of Test for Insulation Resistance of Electrical Insulating Materials. Design and application of test electrodes to tubular, flat, and liquid insulating materials; apparatus and circuits, control of humidity, procedure for measurement of volume resistance and for surface resistance. and calculations.

American Society for Testing Materials, C 259-44 T; 1944. Tentative Methods of Testing Varnished Cloths and Varnished Cloth Tapes Used in Electrical Insulation. Covers procedures for the testing of varnished cloths and varnished cloth tapes including glass fabrics. Gives requirements for sampling, conditioning, thickness, breaking strength, dielectric strength, endurance, elongation, power factor and dielectric constant, insulation resistance, resistance to oil, weight, threads per inch, and appendix.

American Society for Testing Materials, D350-43; 1943. Methods of Testing Flexible Varnished Tubing Used for Electrical Insulation. Covers tubing and saturated sleeving used as insulation for leads on electrical apparatus. Gives requirements for sampling, conditioning, apparatus, test specimens, procedure, and report for determining dimensions, dielectric strength, aging, heat endurance, and rate of burning.

American Society for Testing Materials, D351-42T; 1942. Tentative Method of Test for Power Factor and Dielectric Constant of Natural Mica. Includes natural block mica and mica splittings; description of test apparatus, selection of specimens, procedure, and information reported.

American Society for Testing Materials, D 374-42; 1942. Methods of Test for Thickness of Solid Electrical Insulation. For determining the thickness of solid insulating materials, except rubber insulating tape and friction tape for electrical purposes. Precision of methods; method A—machinists' micrometer with ratchet; method B—machinists' micrometer without ratchet; method C—dead weight dial micrometer; and calibration of micrometers.

American Society for Testing Materials, D 468-42; 1942. Methods of Testing Pin-Type, Lime-Glass

Insulators. Covers glass insulators for primary and secondary power distribution to 10,000 volts to ground; requirements for sampling, structural defects, resistance to thermal shock, gaging of threads, mechanical strength, electrical tests, and details of thread standards for the power industry.

American Society for Testing Materials, D 495-42; 1942. Method of Test for Arc Resistance of Solid Electrical Insulating Materials. Describes a high-voltage low-current a.c. arc, drawn between two tungsten pointed electrodes resting on the surface of the material under test, increased until the material fails by becoming conducting. Apparatus, test specimens, procedure, and number of tests.

American Society for Testing Materials, D 530-44 T; 1944. Tentative Methods of Testing Hard Rubber Products. Includes chemical, physical, and electrical tests of vulcanized compositions having a ratio of combined sulfur to rubber over 15 percent. Chemical analysis using A.S.T.M. Method D 297, analysis of ash, procedures for physical tests for tensile strength and elongation, impact resistance, hardness, flexural strength, cold flow, and softening point; and for dielectric strength, power factor, and surface and volume resistivity.

American Society for Testing Materials, D 550-44; 1944. Methods of Testing Glass Spool Insulators. For secondary power distribution. Sampling, routine tests, structural defects, gaging, report, record, and marking.

American Society for Testing Materials, D 649-42 T; 1942. Tentative Method of Test for Compressive Strength of Electrical Insulating Materials. Covers a procedure for determining the maximum compressive strength which an electrical insulating material is capable of developing. This method is applicable to molded plastics, sheet and plate materials, and laminated round rods and tubes. Apparatus, test specimens, conditioning test specimens, procedure, and report.

American Society for Testing Materials, D 650-42 T; 1942. Tentative Method of Test for Flexural Strength of Electrical Insulating Materials. Covers a procedure for determining the flexural strength of all solid electrical insulating materials. Apparatus, test specimens, conditioning test specimens, thickness measurements, procedure, and calculation and report.

American Society For Testing Materials, D 651-42 T; 1942. Tentative Method of Test for Tensile Strength of Molded Electrical Insulating Materials. Covers a procedure for determining the tensile strength of all solid electrical insulating materials. Such factors as the speed of testing, manner of specimen preparation, conditioning of the specimen, surface condition of the specimen, skin effect and the presence of strains in the specimen, all influence the reproducibility of test results. Apparatus, test specimens, conditioning test specimens, test conditions, procedure, and report.

American Society for Testing Materials, D 652-43; 1943. Methods of Measuring Mica Stampings Used in Electronic Devices and Incandescent Lamps. Cover the procedures for measuring the hole spacing, thickness, and hole size of small pieces of fabricated natural mica such as bridges, spacers, and supports used in electronic devices and incandescent lamps. Gives requirements for hole spacing, thickness, hole size, and report.

American Society for Testing Materials, D 669-42 T; 1942. Tentative Method of Test for Power Factor and Dielectric Constant Parallel With Laminations of Laminated Sheet and Plate Insulating Materials. Covers the procedure for determining the power factor and dielectric constant of stiff laminated sheet and plate insulating materials in a direction parallel with the laminations.

American Society for Testing Materials, D 681-42 T; 1942. Tentative Methods of Testing and Tolerances for Jute Rove and Plied Yarn for Electrical and Packing Purposes. Apply to plied jute yarn and to single and plied jute rove, both treated and untreated, for electrical and packing purposes.

American Society for Testing Materials, D 741-43T; 1943. Tentative Methods of Measuring Dimensions of Rigid Rods Used in Electrical Insulation. Gives requirements for conditioning, method of measurement, length of rods 12 in. and under in length, length of rods over 12 in. in length, diameter, and warp.

American Transit Assn. Recommended Guide for Preparation of Specifications for Insulated Wire and Cable, D120-41; 1941. This guide covers general standards for single, multi-conductor belted, and multi-conductor non-belted wires and cables insulated with rubber, varnished cambric, or paper insulation and having any of the usual types of sheath or outer covering. It outlines the information that should be given in purchase orders or inquiries for wire and cable. Covers conductors, insulation, conductor identification, conductor assembly, fillers, binder, shielding, protective covering, saturant and finish, armor, and outer protective covering.

American Transit Assn. Recommended Practice of Acceptance Tests for Insulation Resistance of Trolley Buses, E132-36; 1936. Recommends the method of tests for insulation resistance of trolley buses.

American Transit Assn. Recommended Practice for Insulating Materials for Railway Repair Shop Use, E136-34; 1934. Tapes, treated and untreated, mica and asbestos. Sets forth requirements for various grades of tapes referred to in this specification.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Insulation Resistance. Covers the properties of electrical insulation materials ohmic resistance, temperature effect, surface leakage, instrument checking, and field test.

National Electrical Manufacturers Assn., American Institute of Electrical Engineers, and Edison Electric Institute (published jointly). Standard Basic Impulse Insulation Levels, NEMA 109; 1941. The general principle of insulation coordination requires a reasonable margin between the voltage level held by the protective device and the various basic levels themselves to insure that adequate protection is provided. Gives table with values set up on this basis and defines basic impulse insulation levels and withstand voltage.

Underwriters' Laboratories, Inc. Bulletin of Research 26; 1942. Electrical Conductivity of Snow and Gas Discharge From First Aid Carbon Dioxide Extinguishers. This bulletin describes the electrical conductivity of gas and snow discharged from carbon dioxide extinguishers of the first aid type, when fighting fires in or adjacent to high-voltage electrical equipment. Covers plan of investigation, description of test assemblies, record of tests, summary of test results, conclusions, and recommendation.

Varnished Tubing Assn., Inc. Standards for Varnished Tubing and Saturated Sleeving Used for Electrical Insulation, 1944. Covers the physical requirements and procedure for testing flexible varnished tubing and saturated sleeving used as electrical insulation. Gives definitions, grades, material, color, dimensions, yarn content, sampling, conditioning, test accessories and specimens, diameter and wall thickness tests, dielectric tests, dielectric test procedure, aging test and procedure, heat endurance tests and procedure, burning test and procedure, packing, marking, inspection, rejection, and rehearing.

719.51 Asbestos and Mica

American Society for Testing Materials, D 315-44; 1944. Specifications and Methods of Test for Asbestos Tape for Electrical Purposes. Asbestos tape woven from plain asbestos yarn and suitable for electrical purposes. Gives tolerances, width, thickness, weight, weave, construction, breaking strength, electrical properties, asbestos content, sizing, workmanship, finish, rolls, and methods of testing.

American Society for Testing Materials, D 352-39; 1939. Methods of Testing Pasted Mica Used in Electrical Insulation. Apply to mica sheets made from mica splittings bonded with organic binder, for use in hot molding; commutator insulation, heating plates, and similar purposes. Test specimen and procedures for determining decrease in thickness under pressure, stability, mica and binder content, molding test, dielectric strength, and resistivity.

American Society for Testing Materials, D 375-44; 1944. Specifications and Methods of Test for Asbestos Roving for Electrical Purposes. Covers asbestos textile product for insulation on heat-resisting fixture wire, flexible cord or heater cord, etc. Gives definitions, number (cut), grades, iron content, methods of testing, and total iron content. A. S. T. M. Emergency Alternate Provision EA-D 375; 1942, affected Section 5, Iron Content, and section 14, Procedure.

American Society for Testing Materials, D 748-43T; 1943. Tentative Specifications for Natural Block Mica and Mica Films Suitable for Use in Fixed Mica-Dielectric Capacitors. Gives requirements for types, grades (sizes), electrical and physical properties, visual qualities, methods of testing, and appendix.

American Standards Assn., C 75.6-1943. Glass-Bonded Mica Radio Insulators (American War Standard). For the purpose of facilitating production of glass-bonded mica radio insulators. Gives applicable specifications, classification, material and workmanship, general and detail requirements, methods of inspection, and tests; packaging, packing, and marking for shipment; requirements applicable to individual government departments, notes, and appendix covering design criteria.

National Electrical Manufacturers Assn. Asbestos and Asbestos-Varnished Cambric Insulated Wires and Cables Standards, 39-54; 1939. Cover electrical conductors insulated with asbestos or combinations of asbestos and varnished cambric and finished with cotton braids, asbestos braids, or lead sheaths; gives requirements as to physical properties, electrical and physical tests, dimensional tables for various voltages, and uses.

National Electrical Manufacturers Assn. Manufactured Electrical Mica Standards 39-55; 1939. Includes classification of muscovite and phlogopite (amber) mica splittings; composition, tolerances and properties of manufactured mica sheets and wrappers, dimensions of standard sheets, mica tubes, and rings, using tests in accordance with A.S.T.M. methods.

U. S. Gov., Joint Army-Navy Specification JAN-I-7; 1944. Insulators; Glass-Bonded-Mica, Radio.

U. S. Gov., Navy Dept. Specification 17-I-29; 1942. Insulation; Electrical, Asbestos-Fiber, Treated and Untreated.

U. S. Gov., Navy Dept. Specification 17-I-6d; 1942. Insulation; Electrical, Asbestos-Board, Impregnated.

U. S. Gov., Navy Dept. Specification 17-I-32; 1945. Insulation; Electrical, Mica, Group M.

U. S. Gov., Navy Dept. Specification 17M5c; 1934. Insulation; Electrical, Mica, Plate (Pressed) and Sheet.

U. S. Gov., Treasury Dept., Procurement Div., No.460; 1941. Insulation; Electrical, Asbestos-Board, Impregnated. Shall be of the asbestos-board type, impregnated with a suitable dark colored insulating compound, having a total inorganic content of not less than 80 percent, by weight, of which at least 50 percent shall be asbestos. Gives detail requirements, sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.518; 1941. Wire; Fixture, asbestos-Insulated. Covers two types—(I) plain white or black finish impregnated asbestos insulation and (II) impregnated asbestos insulation with glazed cotton or rayon braid; two classes—(A) solid and (B) stranded. Gives requirements for sizes, material, conductors, asbestos insulation, braids, flame-resisting properties, dielectric strength, amd flexibility; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing asbestos yarns, *see* 545.4; textile testing machines, *see* 770; methods of testing for insulating qualities, *see* 719.50.

719.52 Insulating Fiber and Paper

American Society for Testing Materials, D 202-44T; 1944. Tentative Methods of Sampling and Testing Untreated Paper Used in Electrical Insulation. Sampling, conditioning, moisture content, thickness, weight, apparent density, tensile strength, tearing strength, bursting strength, folding endurance, absorption, air resistance, fiber composition, ash.

acidity or alkalinity, conducting paths, deterioration, and rate of impregnation.

American Society for Testing Materials, D 616-41 T; 1941. Tentative Specifications for Round Phenolic Laminated Tubing for Radio Applications. Cover round phenolic laminated tubing for radio and similar applications where high frequencies are involved. Either rolled or molded tubes may be furnished in accordance with these specifications. Material, punching quality, axial compressive strength, density of rolled tubing, power factor, dielectric constant, and dielectric loss factor; length, standard sizes, inside and outside diameter; permissible variations in diameter and wall thickness; color and finish, methods of testing, workmanship, packing, marking, inspection, rejection; and appendix—usual applications for the various grades of phenolic laminated tubing.

American Society for Testing Materials, D619-42T; 1942. Tentative Methods of Testing Vulcanized Fiber Used for Electrical Insulation. For the rapid determination, with reasonable accuracy, of the amount of moisture and other volatile matter in vulcanized fiber of all grades and thicknesses. Test specimen, procedure, and calculation and report.

American Society for Testing Materials, D 710-43T; 1943. Tentative Specifications for Vulcanized Fibre Sheets, Rods, and Tubes Used for Electrical Insulation. Gives vulcanized fibre, grades, forms and colors, chemical requirements, detail requirements for sheets, detail requirements for round rods, detail requirements for round tubes, sheet sizes and permissible variations, rod sizes and permissible variations, tube sizes and permissible variations, methods of testing, workmanship, inspection, and rejection.

American Transit Assn. Specification for Impregnated Paper Insulated, Lead Covered Cable, D13-41; 1941. This specification is intended to apply to all sizes and classes of impregnated paper-insulated, lead covered cable which is to be used for the transmission and distribution of electrical energy in underground conduit systems. Gives general requirements, tests to be made on each length of cable, tests to be made on samples, tests to be made after installation, reels and shipment, and miscellaneous.

American Transit Assn. Recommended Specification for Weather-Resistant Weatherproof Wire and Cable U.R.C. Type, D114-41; 1941. These specifications cover weather-resistant, weatherproof wire and cable, the conductors, the materials used for the fibrous coverings, and the saturating and finishing compounds. Covers materials and properties, acceptance requirements, general requirements, and appendix.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 13-39; 1939. Hard Fibre. For use in railroad track joints, switch rods, signal pipe, etc. for track circuit insulation in signal service. Allowable variations in contour and dimension, test requirements for electrical surface leakage, specific gravity, compression, and absorption of water.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Vulcanized Fiber. Covers definition, constants, solubility, derivation, uses, grades and forms, containers, and substitutes.

National Electrical Manufacturers Assn. Vulcanized Fiber Standards, 43-87; 1943. A reference work of practical information concerning the manufacture and test of vulcanized fiber. Covers description and standard grades; standard colors; dimensions of vulcanized fibre sheets, blocks, rods, and tubes; and standards for physical, electrical, and chemical properties.

U. S. Gov., Navy Dept. Specification 17-I-10a; 1941. Paper; Insulating (Electrical), Pressboard.

U. S. Gov., Navy Dept. Specification 17-I-11d; 1944. Insulation; Electrical, Paper, Fish.

References.—Methods of electrical testing of insulating materials, *see* 719.50; methods of physical testing of paper and fiber, *see* 470.3; other fiber board (nonelectrical), *see* 472.93; paper in paper insulated cable, see 715.41.

719.53 Marble and Slate Insulation

References.—Electrical slate, *see* 511.53; methods of testing insulating qualities, *see* 719.50; cut-out bases, *see* 714.22; panels and panelboards, *see* 714.41; switchboards, *see* 714.42, 718.22.

719.54 Porcelain Insulation

American Standards Assn., C 75.1-1943. Ceramic Radio Insulating Materials, Class L (American War Standard). For the purpose of facilitating production, procurement, and inspection of ceramic radio insulating materials. Gives applicable specifications, classification, materials, general and detail requirements, methods of test, packing and marking of packages, and notes.

American Standards Assn., C 75.4-1943. Ceramic Radio Dielectric Materials, Class H (American War Standard). For the purpose of facilitating production, procurement, and inspection of ceramic radio dielectric materials. Gives applicable specifications, classification, materials, general and detail requirements, methods of test, packing and marking of packages for shipment, requirements applicable to individual government departments, and notes.

U. S. Gov., Joint Army-Navy Specification JAN-I-8; 1944. Insulators; Steatite, Radio.

U. S. Gov., Joint Army-Navy Specification JAN-I-10; 1944. Insulating Materials; Ceramic Radio, Class L.

U. S. Gov., Joint Army-Navy Specification JAN-I-12; 1944. Insulating Materials; Ceramic Radio Dielectric, Class H.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-229D; 1938. Radio Insulator; Ceramic and Vitric.

References.—Electrical porcelain, porcelain insulators, *see* 532.22; methods of testing insulating qualities, *see* 719.50, 532.22.

719.55 Rubber Compounds and Tapes

American Society for Testing Materials, D119-38; 1938. American Standards Assn., C59.6-1939. Rubber Insulating Tape. For insulating joints in electric wires and cables. Construction, chemical composition, tensile strength, dielectric strength, and fusion test requirements, standard weight, dimensions, and permissible variations. A.S.T.M. Emergency Alternate Provisions EA-D119; 1942, affected sections 2, 4, 5, 6, 8, 13, and 15.

American Society for Testing Materials, D532-39T; 1939. Tentative Specifications for Rubber Sheath Compound for Electrical Insulated Cords and Cables. Covers a durable vulcanized rubber compound for use as the outer covering or sheath on insulated electrical cords and cables. Requirements for sampling, physical properties, tear test, and for other tests using A.S.T.M. Method D470. A.S.T.M. Emergency Alternate Provision EA-D 532; 1942, affected section 3, Physical Requirements; section 6, Test Specimens; and section 8, Methods of Testing.

American Society for Testing Materials, D 812-44 T; 1944. Tentative Specification for GR-S (Synthetic Rubber) Sheath Compound for Electrical Insulated Cords and Cables Where Extreme Abrasion Resistance Is Not Required. Gives scope, character of sheath, methods of testing, physical requirements, sampling for original physical tests, sampling for accelerated aging tests, test specimens, and rejection.

American Society for Testing Materials, ES 6a; 1943. Emergency Specifications for GR-S Synthetic Rubber Sheath Compound for Electrical Insulated Cords and Cables. Covers a durable, vulcanized synthetic rubber compound suitable for use as the outside covering or sheath on insulated electric cords and cables. Gives requirements for character of sheath, methods of testing, physical requirements, sampling for original physical tests, sampling for accelerated aging tests, test specimens, and rejections.

American Transit Assn. Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Class A Compound, D10-41; 1941. Apply to the rubber compound used for the insulation of electric wire and cable, and which is known as Class A 30 percent Hevea rubber. Gives requirements as to conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for General Purposes—Code Rubber Insulation, D116-41; 1941. This specification applies to the rubber compound used for insulation of electric wire and cable and which is known as code rubber insulation. Covers general requirements, conductor, insulation, cable tape, braid, finish, lead sheaths, and armor.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Class AO Compound, D117-41; 1941. These specifications apply to the rubber compound used for the insulation of electric wire and cable and which is known as Class AO 30 percent Hevea rubber. Covers general requirements, conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

American Transit Assn. Recommended Specification for Rubber Insulated Wire and Cable for Outside Use for Power Distribution Purposes—Performance Rubber Compound, D118-41; 1941. This specification is intended to cover the furnishing and testing of various kinds of rubber insulated conductors for power distribution purposes, the insulation to be of the grade known as Performance Rubber Compound. Covers general requirements, conductor, insulation, cable tape, cotton braid, finish, lead sheaths, and armor.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 56-41; 1942. Joint Specification of the A.A.R. Electrical Section (Engineering Div.), Signal Section, and Telegraph and Telephone Section. Rubber Insulating Tape. Includes requirements for material and workmanship, tape in accordance with American Society for Testing Materials Specification D 119, inspection, tests, acceptance, packing and marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-34; 1928. Rubber Insulating Tape. Quality requirements for rubber, modified A.S.T.M. Method of Chemical Analysis D-15, tensile strength, dielectric properties, and fusion tests, standard weight, dimensions, and variations.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C8.11-1936. American Institute of Electrical Engineers' Standard C8.11. Tentative Standard for Code Rubber Insulation for Wire and Cable for General Purposes.

Electrical Standards Committee of American Standards Assn., sponsor. American Standards Assn., C8.17-1936. American Institute of Electrical Engineers' Standard C8.17. Tentative Standard for Class AO 30 Percent Rubber Insulation for Wire and Cable for General Purposes. Apply to the rubber compound used for the insulation of electric wire and cable (up to and including wire and cable for 5,000 rated circuit volts) and which is known as Class AO 30 percent Hevea rubber.

International Municipal Signal Assn., Inc. Specification No. 91; 1942. Rubber Insulating Tape. Covers rubber insulating tape suitable for the insulation of joints in electrical wires and cables and for other insulating use in fire alarm, police signal, and other municipal signal systems. Gives requirements for material, separator, rubber compound, dimensions, packing and marking for shipment, sampling and testing, and inspection and acceptance or rejection.

U. S. Gov., Army Air Forces. Specification 26594 (2); 1944. Tape; Rubber, Vulcanized.

U. S. Gov., Army Air Forces. Specification 26595(2); 1944. Tape; Rubber, Vulcanizing.

U. S. Gov., Army Air Forces. Specification 40684 (1); 1944. Kit; Cable Vulcanizing, Type X-1, Portable, Field Lighting.

U. S. Gov., Federal Specification HH-T-111a; 1939. Tape; Rubber, Insulating. Covers one grade. Gives requirements for material and workmanship, composition, dimensions, separator, tensile strength, ultimate elongation, fusion, tackiness, and dielectric strength; methods of sampling, inspection and tests; and packing, packaging, and marking for shipment. Emergency Alternate Federal Specification E-HH-T-111a, July 1943, required one grade suitable for insulating splices in electric conductors under normal conditions and changed requirements for composition, dimensions, tensile strength, ultimate elongation, dielectric strength, sampling, test, packaging, and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-134D; 1930. Compound; Insulating, 30 Percent Rubber, for Wire, Etc.

References.—Methods of testing, *see* 719.50; methods of testing rubber goods, *see* 200; rubber insulated cables, cord, wire, *see* 715.41, 715.42, 715.44; rubber matting for use around electrical apparatus, *see* 208.1.

719.56 Textiles Used for Electrical Insulation

American Society for Testing Materials, D69-38; 1938. Friction Tape for General Use for Electrical Purposes. Applies to tape commonly used for protecting and binding in place, joints of electrical wires, and other electrical and mechanical purposes. Requirements for cotton sheeting, frictioning compound, impregnation, adhesiveness, tackiness, discoloration of copper, pinholes, tensile strength, dielectric strength, parallelism of threads, sizes, and methods of testing. A. S. T. M. Emergency Alternate Provisions EA-D69a; 1942, affected sections 3, 6, 7, 13, 19, 20, 21, and 22.

American Society for Testing Materials, D 335-36; 1936. 0.007-Inch Cotton Tape for Electrical Purposes. Requirements for uniform woven tape free from "motes" or other impurities, with selvage edge, for sizing, physical properties, tests using A. S. T. M. Method D 259, winding, and size of rolls.

American Society for Testing Materials, D372-44T; 1944. Tentative Specifications for Flexible Treated Cotton and Rayon Sleeving Used in Electrical Insulation. Covers five grades of tubing, requirements for material, color, dielectric strength, aging test, heat endurance, rate of burning, table of standard sizes and permissible variations, and tests in accordance with A. S. T. M. Method D350.

American Society for Testing Materials, D 373-44T; 1944. Tentative Specifications for Black Bias-Cut Varnished Cloth Tape Used for Electrical Insulation. For insulating bus bars, joints and terminals of wire and cable, and electric apparatus connections. Includes requirements for manufacture, surface, breaking strength, elongation, resistance to oil, dielectric strength, dimensions and permissible variations.

American Transit Assn. Recommended Specification for Varnished Cambric Insulated Cables, D113-41; 1941. This specification applies to all sizes and classes of varnished cambric lead covered or braided cables which are to be used for the transmission and distribution of electrical energy, and may apply to either underground, aerial, or station cable, under normal conditions of installation. Gives general requirements, tests to be made on each length of cable, tests to be made on samples, and general provisions.

American Transit Assn. Recommended Practice for Insulating Materials for Railway Repair Shop Use, E136-34; 1934. Cloths, treated and untreated. Gives requirements as to the thicknesses and grades of weave and finish for cloths referred to in this specification.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 4-a-41; 1941. Specification for Friction Tape for Railroad Use. Gives purpose, tender, material and workmanship, cotton sheeting, frictioning compound, impregnation of fabric, pin holes, tensile strength, dielectric strength, dimensions, cutting into rolls, inspection, tests, acceptance requirements, packing, and warranty.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 82-41; 1942. Joint specification with A. A. R. Electrical Section (Engineering Div.), Signal Section, and Telegraph and Telephone Section. Friction Tape for Railroad Use. Includes requirements for material and workmanship, cotton, sheeting, frictioning compound, impregnation of fabric, pin holes, tensile strengths, dielectric strength, dimensions, cutting into rolls, inspection, tests, acceptance, packing and marking, and warranty.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 182-40; 1941. Weather-Resistant Braid for Insulated Wire and Cable. Provides for rubber-filled tape, outer braid coverings and weather-resistant saturant and finish on insulated wire and cable for use on signal circuits rated at 0-600 and 601-2,500 volts. Braid in accordance with American Standard Assn., C8.12, except angle of yarn, cable tape meeting A. S. T. M. Specification D 27, properties of saturant, mineral filler, performance tests, and alternate requisites.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 191-40; 1941. Flame-Retarding, Moisture Resistant Braid for Insulated Wire and Cable. Provides for rubber-filled tape, outer braid coverings and flame-retarding, moisture resistant finish on insulated wire and cable for use in weather protected locations and on signal circuits rated at 0-600 and 601-2,500 volts. Braid in accordance with American Standards Assn., C8.12, except angle of yarn, rubber-filled tape meeting A. S. T. M. Specification D 27, saturant of asphalt or stearine pitch base compound, finishing compound, and mica requirements. Also gives performance tests required.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-30; 1927. Friction Tape. Describes cotton sheeting fabric, adhesive rubber base insulating compound, impregnation, and gives requirements for adhesive test, tensile strength, pin holes, dielectric strength, standard weight, dimensions, and permissible variations.

National Electrical Manufacturers Assn. Black and Yellow Bias-Cut Varnished Cloth Tape. Standard 38-50; 1938. Includes both black tape and yellow tape for insulating electrical connections and apparatus; requirements as to dimensions and permissible variations, manufacture, tensile strength, and resistance to oil, with physical tests in accordance with A. S. T. M. Specification D295.

U. S. Gov., Federal Specification HH-T-101a; 1939. Tape; Friction. Covers two grades—(A) for general use and (B) for tropical conditions. Gives requirements for material, sulfur, adhesion, raveling, physical properties, friction, dielectric strength, accelerated aging, tackiness, age, sampling, inspection, tests, packaging, packing, and marking. Emergency Alternate Federal Specification E-HH-T-101a; 1943, required one grade and changed requirements for friction compound, physical properties, friction, accelerated aging, tackiness, sampling, inspection, and tests, packaging, and marking.

U. S. Gov., Navy Dept. Specification 17C8a; 1941. Cambric; Insulating, Varnished.

U. S. Gov., Navy Dept. Specification 17-I-30; 1944. Insulation; Electrical, Cotton-Fiber, Untreated (Group CFU).

U. S. Gov., Navy Dept. Specification 17S10b; 1944. Sleeving; Insulating, Cotton.

U. S. Gov., Navy Dept. Specification 17T15b; 1942. Insulation; Electrical, Tape, Linen-Finish, Plain.

U. S. Gov., Navy Dept. Specification 53T4a; 1935. Tape; Linen, Gummed.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-298; 1941. Duck; Varnished Cotton (for electrical Insulation).

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-299; 1941. Cambric; Varnished (for Electrical Insulation).

U. S. Gov., U. S. Army, Signal Corps. Specification 6-145B; 1930. Bandage; Type TL-97, Cable Splicing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-75A; 1925. Cloth; Insulating.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-572; 1931. Bandage; Type TL-124, for Underground Conduit Construction.

References.—Insulating varnish, *see* 719.57; methods of testing, *see* 719.50; methods of testing rubber filled tape, *see* 200; methods of physical and chemical testing of fabrics, *see* 300.4; test methods and tolerances for electrical cotton yarns, *see* 302.10; varnished cambric insulation on wires and cables, *see* 715.44, 715.41; asbestos tape, *see* 719.51.

719.57 Electrical Insulating Varnishes

American Society for Testing Materials, D 115-41; 1941. Methods of Testing Varnishes Used for Electrical Insulation. For varnishes which are applied by brushing, dipping, or spraying and intended primarily for the purpose of providing electrical insulation. Density, viscosity, flash point, thickness, drying time, dielectric strength of varnish in solid state, heat endurance test, oil proof test, draining test, weight of nonvolatile matter, dielectric strength of liquid varnish, and description and use of the remodeled MacMichael viscosimeter.

American Society for Testing Materials, D 411-44; 1944. American Standards Assn., C59.18-1944. Methods of Testing Shellac Used for Electrical Insulation. For tests in accordance with A.S.T.M. Method D 29 for sampling, insoluble matter, iodine number, moisture content, wax, and ash. Requirements for determination of polymerization time, flow test, and details for apparatus; and methods of procedure.

American Society for Testing Materials, D 784-44T; 1944. Tentative Specification for Orange Shellac and Other Indian Lacs for Electrical Insulation. Gives scope, properties, and methods of testing.

American Transit Assn. Recommended Practice for Insulating Materials for Railway Repair Shop Use, E136-34; 1934. Baking varnishes referred to in this specification are composed of linseed or other drying oils, with or without gums or resins, and with a minimum amount of drier. A baking varnish should not be used except where baking at one hundred (100) to one hundred and ten (110) degrees C. is possible. At this temperature the varnish should harden in from twelve (12) to twenty-four (24) hours. Describes also the characteristics of these varnishes.

American Transit Assn. Recommended Practice for Insulating Materials for Railway Repair Shop Use, E136-34; 1934. Spirit varnishes referred to in this specification are composed of animal, vegetable, and synthetic gums or resins, such as shellac, copal, synthetic resin, etc., dissolved in spirits. Characteristics— oil resisting but not generally moisture-proof. This type of varnish is used extensively for stickers and binders in the manufacture of coils.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1932. Varnish Treatment of Electrical Windings. Gives insulation requirements, action on other materials, corrosion, life, fissures, elasticity, and temperature rating.

U. S. Gov., Navy Dept. Specification 52V13e; 1944. Varnish; Insulating, Electrical.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-182; 1943. Compound; Insulation, Ignition.

References.—Varnish, *see* 846; other impregnating treatment of windings, *see* 719.59.

719.58 Molded and Laminated Insulating Materials, Bakelite and Similar Products

American Society for Testing Materials, D 256-43T; 1943. Tentative Methods of Test for Impact Resistance of Plastics and Electrical Insulating Materials. Intended to determine the relative susceptibility to fracture by shock of plastic materials and electrical insulating materials as indicated by the energy expended by a standard pendulum type impact machine in breaking a standard specimen in one blow. Gives requirements for apparatus, test specimen, conditioning test specimens, procedure and report for both cantilever beam (Izod type) and simple beam (Charpy type) tests.

American Society for Testing Materials, D 348-42; 1942. American Standards Assn., C 59.14-1943. Methods of Testing Laminated Tubes Used in Electrical Insulation. Includes determination of tensile strength, compressive strength, water absorption, density, dielectric strength, power factor, and dielectric constant; requirements for test specimen, apparatus, and routine of procedures.

American Society for Testing Materials, D 349-42; 1942. American Standards Assn., C 59.15-1943. Methods of Testing Laminated Round Rods Used in Electrical Insulation. Requirements for test specimen, apparatus, and test procedure for determining tensile, flexural, compressive strength, water absorption, and density.

American Society for Testing Materials, D 392-38; 1938. American Standards Assn., C59.10-1941. Methods of Testing Molding Powders Used in Manufacturing Molded Electrical Insulators. Tests for physical properties of organic binder, organic and inorganic fillers or mixtures, used in making electrical insulators and other plastic molded parts. Sampling, sieve analysis methods, apparent density, bulk factor, powder pourability, requirements for apparatus and procedures.

American Society for Testing Materials, D 467-44T; 1944. Tentative Specifications for Phenolic Laminated Sheet for Radio Applications. Cover six grades for radio or similar applications where high frequencies are involved. Requirements for layers of paper or cotton fabric impregnated with a phenolic compound and compressed into hard dense sheets under heat, for punching quality, flexural strength, power factor, dielectric properties, standard thicknesses, color and finish, with description of usual applications.

American Society for Testing Materials, D 494-41; 1941. Method of Test for Acetone Extraction of Phenolic Molded or Laminated Products. For determination of amount of acetone-soluble matter in molded or laminated phenolic products. Apparatus, preparation of sample, procedure, calculation, and report.

American Society for Testing Materials, D 551-41; 1941. Method of Measuring Shrinkage From Mold Dimensions of Molded Materials Used for Electrical Insulation. For comparison of batch-to-batch uniformity of thermo-plastic or thermosetting materials, but not for determination of shrinkage in any type of mold, nor shrinkage due to aging. Sampling, apparatus, test specimens, procedure, calculations and report, and reproducibility of results.

American Society for Testing Materials, D 570-42; 1942. Method of Test for Water Absorption of Plastics. Covers immersion test for guide to electrical and mechanical properties, and as a control test for uniformity of product. Describes apparatus, preparation of specimen, and procedure including reconditioning, calculation, and report.

American Society for Testing Materials, D 616-41 T; 1941. Tentative Specifications for Round Phenolic Laminated Tubing for Radio Applications. Cover round phenolic laminated tubing for radio and similar applications where high frequencies are involved. Either rolled or molded tubes may be furnished in accordance with these specifications. Material, punching quality, axial compressive strength, density of rolled tubing, power factor, dielectric constant, and dielectric loss factor; length, standard sizes, inside and outside diameter; permissible variations in diameter and wall thickness; color and finish, methods of testing, workmanship, packing, marking, inspection, rejection; and appendix—usual applications for the various grades of phenolic laminated tubing.

American Society for Testing Materials, D618-44T; 1944. Tentative Methods of Conditioning and Classifying for Conditioning Plastics and Electrical Insulating Materials for Testing. Cover procedures for establishing standard periods of time, temperatures, and relative humidities to be used in the pretreatment of plastics and electrical insulating materials prior to testing, as well as in the actual testing of such plastics whose physical properties are subject to rapid change as a result of variations in atmospheric conditions. Classification of materials for conditioning, apparatus, procedure, and report.

American Society for Testing Materials, D752-44T; 1944. Tentative Specifications for GR-M Polychloroprene Sheath Compound for Electrical Insulated Cords and Cables. Gives scope, character of sheath, methods of testing, physical requirements, sampling for original physical tests, sampling for accelerated aging and oil immersion tests, test specimens, oil immersion test, and rejection.

American Society for Testing Materials, D753-44T; 1944. Tentative Specifications for GR-M Polychloroprene Sheath Compound for Electrical Insulated Cords and Cables Where Extreme Abrasion Resistance Is Not Required. Gives scope, character of sheath, methods of testing, physical requirements, sampling for original physical tests, sampling for accelerated aging and oil immersion tests, test specimens, oil immersion test, and rejection.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1943. Insulating Material for Train Control and Locomotive Lighting Equipment. Recommends material impervious to moisture, durable, strong, and seasoned to resist 300° F., or 400° F., if necessary, form of terminal blocks, and to comply with requirements for molded insulating materials, A.S. T.M. D48-27.

National Electrical Manufacturers Assn. Laminated Phenolic Products Standards 39-57; 1939. Includes phenolic plate, tubing and rod, in four grades of paper base laminated, and fabric base laminated; tolerances, tensile, flexural, dielectric, moisture, absorption properties, and table of equivalent rule numbers.

National Electrical Manufacturers Assn. Recommended Practice for Machining and Punching of Laminated Phenolic Plate, 39-58; 1939. For use in fabrication operations including sawing, drilling, tapping, threading, milling, turning, punching, shaving, and shearing. Includes table of punching properties of various grades.

U. S. Gov., Army Air Forces. Specification 32212-A; 1940. Phenolic-Material; Molded.

U. S. Gov., Federal Specification HH-P-256; 1940. Phenolic-Condensation-Products; Laminated (for Electrical Purposes). Covers three types—(I) paper base laminated phenolic material; (II) fabric base laminated phenolic material; (III) fabric base macerated material; and (IV) asbestos base laminated material. Each type, except III, is available in four forms—sheets, tubes, molded rods, and molded shapes. Type III is available only in sheets and molded shapes. Type I has six grades—X, P, XX, XXP, XXX, and XXXP; type II, four grades—C, CE, L, and LE; type III, one grade—F; and type IV, two grades—A and AA. Gives tables of available thicknesses for each type, grade, and form. Covers requirements for material and workmanship, uniformity, finish, mechanical properties, warp, physical properties, water absorption, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-P-14; 1944. Plastic-Materials; Molded Thermosetting.

U. S. Gov., Navy Dept. Specification 17M11b; 1942. Molds for Molded Electrical Insulation.

References.—Methods of electrical testing, *see* 719.50; methods of physical testing of paper and of fiber board, *see* 470.3.

719.59 Miscellaneous Electrical Insulating Materials

American Institute of Electrical Engineers, No. 21; 1941. Apparatus Bushings, Proposed Standard, and Proposed Test Code. Covers proposed standard service conditions, rating, definitions, heating, dielectric tests, and name-plate markings; and proposed test code classification of bushing tests and test procedure.

American Society for Testing Materials, D 668-44; 1944. Methods of Measuring Dimensions of Rigid Tubes Used in Electrical Insulation. Cover procedures for measuring the dimensions of all rigid tubes used in electrical insulation, the limitations imposed being those of the size range of the more common forms of measuring instruments used.

American Standards Assn., C 75.2-1943. Steatite Radio Insulators (American War Standard). For the purpose of facilitating production of steatite radio insulators. Gives applicable specifications, and drawings, classification, material and workmanship, general and detail requirements, methods of inspection and tests, packaging, packing, marking for shipment, requirements applicable to individual government departments, definitions, drawings showing details, and appendix covering design criteria.

American Transit Assn. Recommended Practice for Insulating Materials for Railway Repair Shop Use, E136-34; 1934. Air drying varnishes referred to in this specification should be composed of linseed oil or other drying oils sufficiently treated with or without gums or resins, and with proper amount of driers so that varnish will dry in from three (3) to five (5) hours, leaving a smooth, flexible surface. Such varnish may be obtained which is comparatively oil and moisture resisting. An air drying varnish is used where it is not possible or practicable to employ the baking oven. It is also used as a finishing coat on wound apparatus.

American Transit Assn. Recommended Practice for Insulating Materials for Railway Repair Shop Use, E136-34; 1934. Covers a wide variety of insulating materials, including varnishes, gums, treated and untreated cloths and tapes, mica tapes, sheets, and plates. Requirements concerning the composition and characteristics of each of the items are given in detail. Gives also details relative to the testing of insulated varnishes.

American Transit Assn. Recommended Practice for Insulating Materials for Railway Repair Shop Use, E136-34; 1934. Treating compounds referred to in this specification includes those compounds composed of asphalt and linseed oil. Details are given concerning the characteristics and composition of these compounds.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1932. Impregnating Compound Treatment of Electrical Windings. Insulation properties, effect on other materials, corrosion, life, plasticity, and temperature rating requirements.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 177-39; 1939. Insulating Material for Filling and Sealing Recesses in Signal Apparatus. Material for filling and sealing porcelain, glass, metal, wood, etc. Adhesive qualities and tests. Refers to the A.S.T.M. Test D-36 for melting point, and A.S.T.M. Test D-176 for coefficient of expansion.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 181-39; 1939. Paint and Painting of Braid-Covered Aerial Wires and Cables. Asphalt or pitch type of cable paint, with volatile thinner, for the preservation of fibrous covering such as braids, servings, tapes, etc., from the effects of weather, acids, alkalies, and gases generally present. Application, and with tests of nonvolatile base by A.S.T.M. D-255, flash point by A.S.T.M. D-56, and dielectric strength by A.S.T.M. D-115 methods.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 184-40; 1941. Fusible Asphaltic Base Sealing Compound for Protecting Wire Entrances, Outlets, Sleeves, Potheads, Etc., Against the Entrance of Moisture. General requirements, physical and electrical characteristics, inspection, and marking.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 187-39; 1939. Paint and Painting of Braid-Covered Aerial Wire and Cable. Asphalt or coal tar emulsion type of cable paint with details as to composition, properties, and application. Tested in accordance with A.S.T.M. D-255 for water content, and A.S.T.M. D-140 for sampling, also A.S.T.M. D-115 to determine dielectric strength.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 188-40; 1941. Cold Application Compound for Closing Wire Entrances and Openings. For closing mechanism cases, switch circuit controllers, relay housings, parkway and trench cable outlets, etc., to exclude insects, vermin, rodents, and foreign material. Gives physical and electrical characteristics required, inspection, and marking.

U. S. Gov., Federal Specification JJJ-W-151a, 1938. Wax; Sealing. Covers two types—(I) stick type to be heated over a flame, and (II) in bulk for use in gas or electrically heated melting pots; and four grades—A, B, C, and D. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 17-I-13a; 1941. Insulation; Electrical, Slot-Cell, Composite, Armature.

U. S. Gov., Navy Dept. Specification 17-I-15a; 1944. Insulation; Electrical, Plastic-Sealer.

U. S. Gov., Navy Dept. Specification 17-I-16c; 1944. Insulating-Material; Electrical, Liquid, Quick-Drying.

U. S. Gov., Navy Dept. Specification 17-I-31a; 1944. Insulation; Electrical, Glass-Fiber, Untreated, Group GFU.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-449A; 1942. Compound; Insulating, Type IC-1.

References.—Varnish treatment of windings, *see* 719.57; transformer oil, *see* 504.8; wooden insulators and insulator pins, *see* 429.7; glass insulators, *see* 526.1; cap and cone insulators for trolley wire support, *see* 719.63; globe, composition, and Brooklyn strain insulators, *see* 719.63; petrolatum for use in impedance bonds, *see* 504.6; petroleum asphaltum for protecting wires in trunking, *see* 505.14.

719.6 ELECTRICAL LINE MATERIALS, AERIAL AND UNDERGROUND

719.60 General Items

American Transit Assn. Recommended Specification for Joint Use of Wood Poles, D112-31; 1931. This specification applies to all construction on wood poles used jointly by supply and communication circuits. The specification is intended to embody requirements which are most important from the standpoint of safety to employees and the public. It states the minimum requirements for spacings, clearances, and strength of construction. The specification includes definitions, and covers various grades of construction, vertical clearances and runs, communication cables or conductors on suspension strand, climbing space, fixtures for street lighting, trolley span wires and brackets, pole steps, guy attachment and clearances, guy and line insulators, loading, strength requirements, and inspection.

American Transit Assn. Recommended Principles and Practices for Joint Use of Wood Poles, D123-37; 1937. Emphasizes the advantages in the joint use of poles with other agencies from the point of view of conservation, economy, and public relations.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (VI-b-25) Specifications for the Construction of Overhead Electric Supply Lines for Railroad Use on Railroad Property. Describes the standard practices for the construction of electric power transmission and distribution pole lines, exclusive of overhead contact wires. Covers general requirements, construction at railroad crossings and crossings of communication lines, clearances, grading of lines, loading, conductor attachments, insulated pins, crossarms, strength of supporting structures, wood poles, steel structures, concrete, guys, grounding, and permissible unit stresses and proportion of ultimate strength.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (VI-c-26) Specifications for the Joint Use of Poles for Power, Communication, and Signal Circuits. Describes the standard practice for the joint use of electric power, transmission, and distribution circuits, as defined below, with signal and communication circuits on wood pole lines for railroad use, on railroad property. These provisions do not apply to pole lines where class "S" and "T" circuits only are involved.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (VI-d-26) Specifications for the Maintenance of Overhead Electric Supply Lines. Gives instructions and specifications for the guidance of forces engaged in maintaining overhead electric supply lines for railroad use on railroad property.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Railroad Specification for Electric Light, Power Supply, and Trolley Lines Crossing Railways.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1944. Specification for Communication Lines Crossing the Tracks of Railroads.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1934. Specification for Communication Underground Conduit Construction.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-6; 1939. Specification for the Construction of Railroad Communication Pole Lines. Describes standard requirements for the construction pole lines carrying communication wires and cables, also for joint use with foreign communication or railway signal circuits; strength of lines, clearances of poles and attachments, location, pole setting, fitting, guying, and bracing; wire and aerial cable construction, terminal, and long span construction; and guard screens.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-24; 1927. Joint Use of Poles for Power, Communication, and Signal Circuits. Gives classification of circuits, requirements for relative position and spacing of circuits, climbing space, methods of supporting conductors and cables, minimum sizes of conductors, insulation and support of vertical conductors, installation of apparatus, pole steppings, and dimensions of crossarms.

Assn. of American Railroads, Telegraph and Telephone Section, 1-B-1; 1937. Communication Lines Crossing the Tracks of Railroads. Requirements for construction and maintenance of telephone and telegraph lines crossing steam and electrified railroads including overhead, underbridge, and underground crossings, clearances, ducts, cable sags, poles, drainage, attachment, and protection from moving vehicles, with tables and dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 1-C-1; 1940. Underground Conduit Construction. Covers requirements for constructing underground communication electric lines as to precautionary measures, locations and clearances, material including reducers, risers, U guard, manholes, frame and covers, cable racks and hooks, concrete work, trenching, grading, creosoted wood duct, tile duct, iron and steel pipe, fiber duct, laterals, etc.

Assn. of American Railroads, Telegraph and Telephone Section, S-1; 1923. Electric Light, Power Supply, and Trolley Lines Crossing Railways. Requirements for clearance, loading, wires and cables, insulators, supporting structures, grounding, trolley line crossings, underbridge and underground crossings. This specification was adopted by the American Railway Engineering Assn. Committee on Electricity in 1923.

Assn. of American Railroads, Telegraph and Telephone Section, S-2. Construction of Overhead Electric Supply Lines for Railroad Use on Railroad Property. Specification covering electric power transmission and distribution pole lines, requirements as to location, relative levels, fire hazards, tree trimming, protective coatings, guards and signs, clearances, grading of lines, loading, wires and cables, insulators, crossarms, supporting structures, grounding, and permissible unit stresses for wood and steel supporting structures for two types of construction depending on location of line.

Copper Wire Engineering Assn. Conductor Engineering Data for Rural Lines—Heavy Loading District. Includes reference data on pole outline, sag clearance, span relation, wire clearance over ground, and wire crossing clearance; span companions, poles per mile, and choice of rural conductors; conductor properties (wire and loading tables), splicing sleeves, quantities for various assemblies, and line ties on pin insulators; and design data covering conductivity selection for primaries, staking suggestions, span selection charts, structure selection charts, transverse load-tangent poles, reduced span for reduced tension, line secondaries, various unit costs, guy tables, sags for weatherproof copper conductors, design tables, stringing tables, and sag and tension charts.

Copper Wire Engineering Assn. Conductor Engineering Data for Rural Lines—REA-Type—Medium and Light Loading Districts. Includes reference data on pole outline, sag clearance, span relation, wire clearance over ground, and wire crossing clearance; span companions, poles per mile, and choice of rural conductors; conductor properties (wire and loading tables), splicing sleeves, quantities for various assemblies, and line ties on pin insulators; companion of 8C and 9-1/2D copperweld-copper conductors; and design data covering conductivity selection for primaries, staking suggestions, span selection charts, structure selection charts, transverse load-tangent poles, reduced span for reduced tension, line secondaries, various unit costs, guy tables, sags for weatherproof copper conductors, design tables, stringing tables, and sag and tension charts.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H32; 1941. American Standards Assn., C2.2-1941 (National Electrical Safety Code). Safety Rules for the Installation and Maintenance of Electrical Supply and Cummunication Lines. For line insulators for grade A and B construction, requirements for wet porcelain insulators for voltage of 2,300 or above, including ratio of flashover to puncture voltages, dry flashover test requirements for insulators for various voltage applications.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H32; 1941. American Standards Assn., C2.2-1941 (National Electrical Safety Code). Safety Rules for The Installation and Maintenance of Electrical Supply and Communication Lines. For overhead lines, requirements on relative levels on pole of various classes of lines, on clearance between supporting structures and other objects, between wires and ground or rails, between crossing lines, between conductors of same line, climbing and working spaces, grades of construction, assumed loadings, strength requirements for various parts of line construction, requirements of insulators, tables of recommended normal sags of copper conductors, minimum permissible sags with tensions and stresses, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H34; 1938. American Standards Assn., C2.4-1939. Safety Rules for the Operation of Electrical Equipment and Lines (Comprising Part 4 of the Fifth Edition, National Electrical Safety Code). Precautions and rules to be observed in handling supply lines and equipment, killing lines or equipment, making protective grounds, for overhead and underground power lines and communication systems, etc.

719.61 Electric Wire and Cable Supports

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-20; 1927. Pole Line Hardware. Covers two grades of steel with tensile and bend test requirements, galvanizing conforming to A.A.R. Specification 1-D-5, and dimensional drawings of various standard items of pole line hardware.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-3; 1924. Cross Connecting Ring AAR-1-A and 2-G-4; 1924. Cross Connecting Ring AAR-2-A. Two sizes of clamps for grouping and supporting the connecting wires between protectors and terminal blocks in metal boxes; requirements for material, workmanship, dimensions; and tests with dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-58; 1930. Switchboard Cable Support. To be used for supporting the cabling behind panels mounted on switchboard framework. Gives general requirements, material and workmanship, dimensions, finish, inspection, tests, packing, marking, and warranty.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-63; 1931. Cross-Connecting Rings ARA-3-A and ARA-4-A. Used to group cross-connecting wires between protectors and terminal blocks in metal boxes. Gives general requirements, material and workmanship, dimensions, finish, inspection, tests, packing, and warranty.

International Municipal Signal Assn., Inc. Specification No.51; 1942. Galvanized Steel Cable Rings. Covers cable rings for general use in aerial construction of multi-conductor, lead and loom covered cables, on messenger for fire alarm, police, and other signal services. Gives requirements for fit of hooks on strand gauge, position assumed by ring when assembled on strand gauge, unobstructed opening in eye of ring when assembled on strand gauge, deflection test, and brittleness test.

International Municipal Signal Assn., Inc. Specification No.51-A; 1942. Copper Covered Steel Cable Rings. Covers copper covered steel wire used in the manufacture of cable rings for supporting aerial cable and finished cable rings made of such wire. Gives requirements for wire, cable rings, and inspection.

U. S. Gov., Joint Army-Navy Specification JAN-G-160; 1944. Grips; Cable, Shipboard Use.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-80B; 1930. Ring; Cable, for Suspending Aerial Cables.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-94C; 1929. Roller; Type LC-26, Cable Roller.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1020; 1941. Rack; Types FM-34, FM-35, FM-36, and FM-37.

References.— Construction of lines, crossings, safety codes, *see* 719.60; zinc coatings, *see* 600.3; methods of testing and general requirements for metals, *see* 600.1; wood insulator pins, *see* 429.7; glass insulators, porcelain insulators, *see* 526.1, 532.22; insulator gages, *see* 615.82.

719.62 Poles and Appurtenances

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (VI-c-26) Specifications for the Joint Use of Poles for Power, Communication, and Signal Circuits. Describes the standard practice for the joint use of electric power, transmission, and distribution circuits, as defined below, with signal and communication circuits on wood pole lines for railroad use, on railroad property. These provisions do not apply to pole lines where class "S" and "T" circuits only are involved.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1929. Specification for Pole Line Hardware.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-20; 1927. Pole Line Hardware. Covers two grades of steel with tensile and bend test requirements, galvanizing conforming to A.A.R. Specification 1-D-5, and dimensional drawings of various standard items of pole line hardware.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-43; 1931. Pole Balcony A.A.R.-1-A. Balcony for mounting on poles carrying cable boxes, requirements for wood platform and steel angle platform irons and braces, pipe guard rails, galvanizing, painting, and dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-44; 1931. "H" Fixture Balcony A.A.R.-2-A. Balcony for mounting on two poles carrying cable boxes, dimensional drawings and requirements for wood platform, steel angle platform irons and supporting braces, pipe guard rails, galvanizing, and painting.

Assn. of American Railroads, Telegraph and Telephone Section, 1-E-11; 1939. Specification for the Stub Reinforcement of Wood Poles Used in the Communication Plant. For use where poles have deteriorated near ground line, but the balance of the pole is sound. Description of, classification, and method of stub reinforcing, with illustrations.

Edison Electric Institute. Specifications for Strand-Eye Anchor Rods, TD-2; 1942. For use in overhead line construction. Gives requirements for material, dimensions, threads, strength, galvanizing, preferred sizes, finish, packing and shipping, inspection, rejection, and dimensional drawing.

Edison Electric Institute. Suggestions for Specifications for Steel Cross Arm Braces, TD-6; 1940. For use in overhead line construction. Includes—(A) flat braces, (B) alley arm braces, and (C) vertical braces. Gives requirements for material, dimensions, galvanizing, packing and shipping, mechanical requirements of flat steel braces, inspection, rejection, and dimensional drawing.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H32; 1941. American Standards Assn., C2.2-1941. Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines (Comprising Part 2 of the Fifth Edition National Safety Code). Includes requirements on poles and towers, tree trimming, guying, and grounding.

U. S. Gov., U. S. Army, Signal Corps. Specification 23-76B; 1942. Pole; Lance, Type PO-2, for Temporary Telegraph Lines.

U. S. Gov., U. S. Army, Signal Corps. Specification 29-12A; 1930. Brace; Telephone, Crossarm.

U. S. Gov., U. S. Army, Signal Corps. Specification 29-45; 1924. Step; Telephone Pole, Galvanized Steel.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-68A; 1927. Rod; Anchor, Type AH-4, for Telephone Poles.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-73B; 1942. Brackets, Types PF-66; Transposition and Pin, Type PF-62; for Line Construction.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-78B; 1942. Pole Support LC-16.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-81; 1921. Hanger; Messenger, for Supporting Messenger Wire.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-96B; 1943. Pole PO-5, PO-6, and PO-7.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-218A; 1932. Guy; Type GY-8, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-222A; 1932. Guy; Type GY-9, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-223; 1925. Guy; Type GY-7, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-225; 1925. Guy; Type GY-4, Radio.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-252; 1924. Pole; Type PO-1 and Fittings, Tubular Steel, 20-Foot.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-345A; 1928. Bracket; Types PF-65 and PF-71, Telephone Distributing.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-393A; 1927. Stake; Type GP-2.

References.—Trolley line materials and construction, *see* 719.63; tubular steel poles, *see* 607.4; wood poles, wood crossarms, *see* 401.3, 402.1; wood insulators, glass insulators, porcelain insulators, *see* 429.7, 526.1, 532.22; metal insulator pins, wood insulator pins, *see* 719.61, 429.7; metal supporting racks and cross connecting rings, *see* 719.61; steel guy and messenger cable, *see* 603.42; eye bolts, machine bolts, carriage bolts, *see* 608.31; washers, round and square, *see* 608.6; methods of testing and general requirements for metals, *see* 600.1, 500.3; pole line construction, safety code, *see* 719.60; steel towers for transmission lines, *see* 605.23.

719.63 Railway Trolley and Track Materials

American Institute of Electrical Engineers, 17g5. Joint sponsor with American Assn. for the Advancement of Science, American Society of Civil Engineers, Society for Promotion of Engineering Education, and American Society of Mechanical Engineers. American Standards Assn., Z-10g5; 1933. Graphical Symbols Used for Electric Traction Including Railway Signaling. Used in diagrams for power apparatus, relays and instruments, electric traction, car control wiring, and to indicate types of railway signals.

American Society for Testing Materials, B 9-39; 1939. American Standards Assn., H4.5-1940. Bronze Trolley Wire. For round and grooved trolley wire from three classes of bronze; gives requirements for materials, tensile properties, twist tests, dimensions and permissible variations, resistivity, and standard sections of wire.

American Society for Testing Materials, B 47-39; 1939. American Standards Assn., H4.6-1940. Copper Trolley Wire. For round and grooved trolley wire; requirements as to material, tensile properties, twist test, standard sections, dimensions and permissible variations, resistivity, density, and explanatory notes.

American Society for Testing Materials, B 116-40; 1940. Figure 9, Deep-Section Grooved and Figure 8, Copper Trolley Wire for Industrial Haulage. Gives requirements for material, tensile properties of various sizes, standard sections, dimensions and permissible variations, resistivity, density, finish, and explanatory notes.

American Transit Assn. American Standards Assn., C15-1935. Specification for 750-Volt Direct Suspension Overhead Trolley Contact Construction, D14-37; 1937. This specification covers material necessary for overhead trolley contact construction, including supporting structures, methods of attaching spans, guys and anchors, structural attachments, supporting system, trolley contact wire, frogs and crossings, feeder, and method of protection.

American Transit Assn. Recommended Specification for Catenary Overhead Construction for Other Than Steam Railroad Electrification, D104-28; 1928. Gives requirements as to the type of material to be used for overhead construction, including bridges, steel and concrete poles, methods of attaching spans and guys, hangers, etc.

American Transit Assn. Recommended Specification for Trolley Bus Overhead Construction, D106-33; 1933. Construction shall conform to the requirements for 750-volt direct suspension overhead trolley contact construction, Manual section D101, wherever possible. In general, the material shall conform to the requirements of section D102-30 of the Engineering Manual. Certain special devices are required for trolley bus operation where swivel harps are used. This specification gives detailed requirements for the construction of trolley bus overhead, including pole spacings, trolley wire supports, separation between trolley wires, and insulation.

American Transit Assn. Recommended Design of Device for Temporary Connections to Trolley Wire, D107-35; 1935.

American Transit Assn., sponsor. American Standards Assn., C15-1935. Specification for 750-Volt Direct Suspension Overhead Trolley Contact Construction. Requirements on supporting structures; methods of attaching spans, guys, and anchors; anchors and guys; structure attachments; supporting system; trolley contact wire; frogs and crossings; feeder; and protection.

American Transit Assn. Recommended Specification for Trolley Poles, Wheels, Harps, and Bases, E124-37; 1937. Gives design for trolley poles, together with tables showing dimensions of the poles for each length and class of service. Drawing and a table showing the contact pressure against the trolley wire with the pole at maximum and minimum heights; and also the clearance between the trolley wire and the trolley pole with the latter at a minimum operating height and the wire directly over the center of the track. There is also included information on a method for the determination of the length of the trolley pole for either single or double truck car with trolley wires at various heights above the running board.

American Transit Assn. Standard Location of and Clearances for Third-Rail Working Conductors, Structures, and Rolling Equipment, W3-15; 1915. Gives diagram showing clearance lines for third-rail and permanent way structures and rolling equipment, and conditions under which rolling equipment and structures must not encroach upon third-rail space.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (7-a-37) Third Rail Clearance Diagram. Covers clearance lines for equipment and permanent way structures adjacent to third rail and for third-rail structure.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (7-b-40) Overhead Clearance Diagram. Covers clearance lines for pantograph, catenary construction, and adjacent permanent way structures.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (9-a-32) Specification for Stud Terminal Copper Rail Bonds. Provides for the manufacture and delivery of rail bonds of the stud terminal type for the bonding of track rails forming the negative return in electric traction systems.

U. S. Gov., Dept. of Commerce, National Bureau of Standards H32; 1941. American Standards Assn., C2.2-1941. Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines (Comprising Part 2 of the Fifth Edition National Electrical Safety Code). Includes requirements on electric railway construction, trolley contact conductor supports, high-voltage contact conductors, third rails, prevention of loss of contact at railroad crossings, and guards under bridges.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R65-31; 1931. Packaging of Overhead Electric Railway Material. This recommendation establishes a standard number of units in package for protecting trolley armor, pole bands, fork bolts with insulators, cross-arm braces, crossings or cross-overs, clinch ears, trolley frogs, insulators, cross-arm pins, pullovers, splicing sleeves, and line section switches. Sponsored by the American Transit Engineering Assn.

References.—Poles and supporting material, *see* 719.62, 719.61; trolley wire, *see* 715.44; track materials, *see* 606; bronze castings, malleable iron castings, *see* 646.41, 611.21; methods of testing and general requirements for metals, zinc coatings, *see* 600.1, 600.3.

719.64 Underground Circuit Materials

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section. Manual of Recommended Practice, 1942. (XVIII-a-21) Specifications for Underground Conduit Construction for Power Cables. Describes the materials to be used and the processes to be employed in the construction of underground conduit lines for power cables for railroad purposes. Includes general requirements, ducts or conduits, conduit line construction, laying fiber conduit, splicing chambers, and diagrams.

International Municipal Signal Assn., Inc. Equipment Specification No. 103; 1942. Transit Underground Conduit and Associated Fittings and Bends. Covers underground conduit for installation in ground with or without concrete encasement. Gives requirements for general construction, composition, size and dimensions, bends, straightness, physical tests and requirements, and methods of inspection.

References.—Safety code for underground construction, *see* 719.60.

719.7 CUT-OUT BASES AND CONNECTORS

719.71 Cut-Out Bases

References.—Cut-out bases, *see* 714.22.

719.72 Connectors and Clips

Edison Electric Institute. Suggestions for Specifications for Straight Tinned Copper Connectors, TD-8; 1940. For underground construction for round concentric, round compact, sector and sector compact stranded cables and A W G sizes 4 and 6 solid wire. Gives requirements for material, electrical properties of connectors, dimensions, finish, packing and shipping, inspection, rejections, and table showing dimensions.

National Electrical Manufacturers Assn. Electric Power Connector Standards, 37-47; 1937. Includes conductor connectors and terminal connections of bolted, soldered, shrink-fit, and wedge types; also expansion connectors and ground clamps for power switching equipment. Gives rating and manufacturing standards, definitions, and current-carrying capacities of solid and stranded conductors, iron, and copper tubing in iron-pipe and extra heavy iron-pipe sizes.

Underwriters' Laboratories, Inc. Standard for Pressure Wire Connectors, 1939. Covers pressure-type, solderless, wire connectors for use in accordance with the National Electrical Code. Covers wire connectors which depend on pressure rather than solder as a means of providing contact between current-carrying parts—for use at terminals, between lengths of wires, or for tap connections in accordance with the National Electrical Code. Does not cover binding-screw terminals, fixture-wire connectors, built-in terminal connectors or devices rated at 35 amperes or less and intended for outlet-box mounting or having provision for strain relief, nor built-in terminal connectors on devices having integral cable clamps. Material, design and construction, performance, marking, and inspection of listed product.

U. S. Gov., Army Air Forces. Specification 25530-A (1); 1944. Clip; Tube, Cushioned (Loop-Type) General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-53; 1944. Splices; Electrical Disconnect.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-C-591a; 1944. Connectors; Electrical.

U. S. Gov., Federal Specification W-C-601a; 1943. Connectors; Wire, Pressure, Solderless, (for Electric Cable and Wire). Covers wire connectors which depend on pressure rather than solder as a means of providing contact between current-carrying parts—for use as terminals, between lengths of wires or for tap connections in accordance with the National Electrical Code. Detail requirements as covered by Underwriters' Laboratories Standard for Pressure Wire Connections. Gives methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Straight Copper Connectors for Splicing Cables, 1938.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-70A; 1940. Clip; Galvanized, With Nuts.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-287A; 1926. Connector, Type TM-32-A; Stud, Type FT-49-A; Steel Test Clamp.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-598; 1931. Connector; Type M-120, Antenna and Counterpoise.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-967A; 1943. Line Connector Unit EE-87.

References.—Sockets and plugs, *see* 715.21; fuse clips, *see* 714.22.

719.9 MISCELLANEOUS ELECTRICAL MACHINERY AND SUPPLIES

719.91 Electric Welding Apparatus

References.—Electric welding machines and apparatus, *see* 767; helmets and goggles, *see* 914.5.

719.92 Hotel and Restaurant Electrical Equipment

American Hospital Assn., 40-1. Meat Chopping (Grinding) Machines. Covers hand-operated and motor-operated.

U. S. Gov., Federal Specification OO-M-23; 1936. Amendment 1; 1944. Machines; Coffee-Grinding, Electrically-Operated. Covers two types—counter and pedestal; with the following capacities—60, 90, 150, 250, 350, and 500 lb. per hour. Gives requirements for material and workmanship, machine, base, hopper, burrs, motor, guard, safety stop, receptacle, finish, name plate, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U.S. Gov., Federal Specification OO-M-38; 1942. Amendment 1; 1944. Machines; Food-mixing, Electrically-

Operated, Commercial Type (Cake and Kitchen). Covers the vertical pedestal type having either a cast, fabricated, or formed pedestal; and six sizes—12-, 20- to 22-, 30- to 36-, 60-, 80-, and 100- to 110-qt. bowl capacity. Gives requirements for material, workmanship, condition, service requirements, base, column, spindle, safety device, lubrication, drive, instructions, finish, accessories, motors, starters, clutch, and seals; methods of inspection and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification 00-M-52; 1940. Amendment 1; 1944. Machines; Meat-and Vegetable-Cutting, Electrically-Operated. Covers one type and four sizes. Gives requirements for material, workmanship, construction, operation, capacity, tin coating, bowl, knives, safety device, interlocks, clutch, driving mechanism, housings, frame, pedestal, power take-off device, self-emptying device, lubrication, wiring, finish, attachments, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification 00-M-66; 1940. Amendment 2; 1944. Machines; Slicing, Bread. Covers three types—(I) hand-operated single slicing knife; (II) motor-operated, single slicing knife; and (III) motor-operated, multiple slicing knives. Underwriters' Laboratories, Inc. standard for motor-operated appliances is applicable to this specification. Gives requirements for floor stands, material, workmanship, condition, component parts, gears, grease gun, marking, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification 00-M-81; 1939. Amendment 2; 1944. Machines; Slicing, Meat. Covers two types—(I) hand-operated, and (II) motor-operated; and two classes—(A) full automatic, and (B) semi-automatic. Gives requirements for material, workmanship, condition, construction, slicing knife, drive, meat supports, end-holding device, trays, housings and guards, bases and pedestals, bearings, scraper, sharpener, finish, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification 00-M-106; 1939. Amendment 2; 1944. Machines; Vegetable-Peeling, Electrically-Operated. Covers two types—(I) abrasive-lined metal cylinder, in four sizes; and (II) cement cylinder, in three sizes. Gives requirements for material, workmanship, condition, design and operation, abrasive, leakage, disk, cylinder covering ring, vegetable outlet, sprayer, fittings, frame, motor support, power transmission, wiring, bearings, lubrication, finish, and details for each type and size; methods of inspection and tests; and packing and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-M-48; 1934. Electric Bread Slicer.

U. S. Gov., Veterans Administration. Specification VA-M-56a; 1935. Electric Food Separator.

U. S. Gov., Veterans Administration. Specification VA-M-86b; 1936. Coffee Mills.

U. S. Gov., Veterans Administration. Specification VA-M-94c; 1938. Vegetable Peeling Machines.

U. S. Gov., Veterans Administration. Specification VA-M-132b; 1938. Vegetable Huller.

U. S. Gov., Veterans Administration. Specification VA-M-141; 1935. Electric Fruit and Vegetable Slicing Machine, Small Size.

U. S. Gov., Veterans Administration. Specification VA-M-276; 1937. Vegetable Peeling Machine Cylinder and Revolving Disk.

U. S. Gov., Veterans Administration. Specification VA-MC-87b; 1942. Vegetable Washer.

U. S. Gov., Veterans Administration. Specification VA-MC-89d; 1942. Vertical Type Mixer.

U. S. Gov., Veterans Administration. Specification VA-MC-90a; 1940. Doughnut Cutting Machine.

U. S. Gov., Veterans Administration. Specification VA-MC-92a; 1935. Meat Slicing Machines.

U. S. Gov., Veterans Administration. Specification VA-MC-93c; 1938. Meat and Vegetable Choppers.

U. S. Gov., Veterans Administration. Specification VA-MC-125d; 1942. Silver Burnishing Machine.

U. S. Gov., Veterans Administration. Specification VA-MC-136f; 1941. Meat and Bone Cutters.

U. S. Gov., Veterans Administration. Specification VA-MC-173d; 1941. Three Rack Dishwasher.

U. S. Gov., Veterans Administration. Specification VA-MC-196e; 1942. Two Rack Dishwasher.

U. S. Gov., Veterans Administration. Specification VA-MC-221b; 1941. Dishwashers; Diet Kitchen Size, Model No. 1.

U. S. Gov., Veterans Administration. Specification VA-MC-269d; 1941. Four Rack Dishwasher.

U. S. Gov., Veterans Administration. Specification VA-MC-318; 1942. Gravity Feed Electric Slicing Machine.

719.93 Microphones, Loudspeakers, and Amplifiers

Acoustical Society of America, sponsor. American Standards Assn., Z 24.4-1938. Recommended Practice for the Calibration of Microphones. Comprises a part of a group of definitions, standards, and specifications for use in acoustical work. Purposes are threefold—(1) to assist the National Bureau of Standards in establishing calibrating apparatus for microphones and related acoustical apparatus; (2) to assist in obtaining agreement between different laboratories engaged in the work of calibration pending the availability of the Bureau's equipment, and (3) to further the general knowledge of this subject.

Assn. of American Railroads, Telegraph and Telephone Section, 2-J-36; 1939. Amplifier and Loud Speaker for Use on Railroad Telephone Dispatching Circuits. Gives requirements for self-contained amplifying unit using only primary source of power; operating on standard frequencies and voltages, in-put transformer, amplifier capable of giving a gain of 60 decibels and an undistorted power output of two watts, high voltage of the ringing current not to materially affect operation, designed for nominal output impedances of 6,000 ohms, adjustable means of reducing output, and for speaker directional, uniform frequency response, moderate size, and impedance matched with amplifier.

Institute of Radio Engineers. American Standards Assn., C 16.4-1942. To outline briefly the apparatus which is now used for testing loudspeakers together with the procedure for obtaining the important characteristics which depict the performance of a loudspeaker. Covers the following tests—response-frequency characteristic, directional characteristic, normal-impedance characteristic, nonlinear-distortion characteristic, and efficiency-frequency characteristic.

U. S. Gov., U. S. Army, Signal Corps. Specification 46-10; 1944. Microphone T-21-B.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-958B; 1943. Loudspeaker LS-3 and LS-9.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-978; 1941. Chest Unit; Type BE-74, for Throat Microphone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1062; 1942. Public Address Equipment PA-4-( ); Power Megaphone Component for.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1124; 1941. Jack; Type JK-48, Microphone, 2-Contact, Lightweight, Molded.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1153; 1942. Microphone MC-253-( ); Electromagnetic, for Use in Oxygen Mask.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1154A; 1943. Microphone Unit MC-254A; Carbon, for Use in Oxygen Mask.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1163; 1942. Microphone T-44-( ); Electromagnetic Microphone Assembly for Use in Oxygen Mask.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1164A; 1943. Microphone ANB-M-C1; Carbon Microphone Assembly for Use in Oxygen Mask.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1168; 1942. Jack JK-49; Magnetic Microphone-Headset.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1386; 1942. Microphone T-48-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1514; 1942. Loudspeaker LS-7.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1576; 1943. Public Address Set PA-5-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1603-B; 1944. Microphone T-45.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1760; 1943. Loudspeaker LS-10-( ).

719.94 Gyroscopes, and Gyro Controlled Equipment

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, No.45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. Gyro Compass Equipment and Gyro Pilot. Includes master compass, repeaters of various types, motor-generator, switchboard, alarm circuit, installation and location, automatic and manual control of steering, two unit, and electric steering engine types, wiring, and spare parts.

U. S. Gov., Army Air Forces. Specification No.27450; 1945. Control; Vertical Gyro, Type L-1 (Indicating).

U. S. Gov., Army Air Forces. Specification No.27451; 1945. Control; Rate Gyro, Type M-1, for Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-24a-1; 1945. Transmitters; Gyro Flux Gate Compass.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-C-555a; 1944. Compasses; Gyro Flux Gate.

719.99 Miscellaneous

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 44; 1944. Bus-bar; Electrical. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

American Society for Testing Materials, D761-44T; 1944. Tentative Specifications for Servicing Units for Tests at Subnormal and Supernormal Temperatures of Electrical Insulating Materials and Plastics. Covers scope, requirements, housing, blower and duct system, heating capacity, refrigeration, and temperature control.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-31; 1941. Description and Operation of a 5-Unit Single Magnet Reperforator. Gives introduction, drawings and specification, general requirements, description, and operation.

U. S. Gov., Army Air Forces. Specification No.24826; 1942. Target; Scoring (for Type E-3 Aerial Gunnery Trainer).

U. S. Gov., Army Air Forces. Specification No.24865; 1943. Target; Bomb Scoring, Type E-1 (Sonic).

U. S. Gov., Army Air Forces. Specification No.40727; 1944. Bench; Electrical Repair, Type A-1 (Generator).

U. S. Gov., Navy Dept. Specification 17A9a; 1945. Armature-Stands; Electrical, Coil-Winding.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-71-7A; 1942. Squib; Electric.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-590; 1931. Compound; Cable Pulling.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-868; 1938. Winch; Type MP-34-( ), Electric Motor-Driven.

U. S. Gov., Veterans Administration. Specification VA-G-99d; 1935. Electric Insecticide Dispenser.

U. S. Gov., Veterans Administration. Specification VA-GM-317b; 1940. Electric Dispenser for Liquid Insecticide and Insect Powder.

U. S. Gov., Veterans Administration. Specification VA-MM-311; 1941. Electric Dispenser for Insect Powder.

U. S. Gov., Veterans Administration. Specification VA-MM-312; 1941. Electric Dispenser for Liquid Insecticide and Insect Powder.

U. S. Gov., Veterans Administration. Specification VA-MM-313; 1941. Electric Dispenser for Liquid Insecticide.

720-729 VEHICLES

(Except Agricultural Vehicles and Steam Locomotives)

721. ELECTRIC VEHICLES

721.1 ELECTRIC LOCOMOTIVES

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1940. Electric Locomotives. Gives general principles, systems of electrification, types of electric locomotives, difference between steam and electric locomotives, typical speed-tractive effort curves of electric locomotives, split-phase induction-motor locomotives, motor-generator locomotives, and braking effort.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1940. Oil-Electric Locomotives and Rail Cars. Gives general principles, tractive capacity, power capacity, locomotive output, speed tractive effort curves—oil-electric locomotives, locomotive classification, and weight and capacity.

American Transit Assn. Recommended Practice for System of Nomenclature for Axle and Truck Arrangement of Locomotives Having Electric Drive, E128-32; 1932.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1941. Automotive and Electric Rolling Stock. Covers lubricating oil filters for Diesel engines, reclamation and reconditioning of Diesel engine parts, and specifications for Diesel electric switching locomotives of total weight of 95 tons and above.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Standard Method of Rating Electric Locomotives. Conditions of rating, for maximum start, one hour, and continuous test, data required, one hour ratings to start with cold motor stand rating, tractive effort, and speed formulae.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Standard System of Nomenclature for Axle and Truck Arrangement of Electric Locomotives and Internal Combustion Engine Locomotives Having Electric Transmission. Designation of engines based on numbering idle axles, and letters for driving axles.

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Div., Safety Section. Safety Rules Governing Maintenance of Equipment and Stores Employees, 1942. Gives requirements for prevention of burns (fires, explosions); handling material, tools, and equipment; operation of trucks, tractors, cranes, hoists, and derricks; working on or about machinery, engines, cars, pipe lines, refrigerating or air conditioning units, and elevators; protection against train and engine hazards; and eye protection.

National Electrical Manufacturers Assn. Mining and Industrial Locomotive Standards, 44-96; 1944. A reference work of practical information concerning the manufacture, test, and performance of mining and industrial locomotives and represents general practice in the industry, promotes production economies, and assists users in the proper selection of mining and industrial locomotives. Gives requirements for mining locomotives—trolley type; mining locomotives—storage battery and combination types; industrial locomotives—trolley and third rail types; industrial locomotives—storage battery and combination types; and definitions.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment (comprising Part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators—and the grounding rules of the Fifth Edition, National Electrical Safety Code). For electrically operated locomotives and cars; requirements on guarding live and moving parts, grounding noncurrent-carrying parts, control of energy supply, control of movement, and subway and car lighting.

U. S. Gov., Interstate Commerce Commission, Bureau of Locomotive Inspection. Laws, Rules, and Instructions for Inspection and Testing of Locomotives Other Than Steam, 1926. Requirements mandatory by law, regarding provision and capacity of safety valves for air brake reservoir, operating characteristics of compressor governor and testing of air brake compressors and reservoirs, maximum brake cylinder travel, lost motion in articulated connections or between chafing irons or couplers, permissible side motion and fit requirements at pin and rod bearings, permissible lateral motion in wheel bearings, intermembering of truck center plates, clearance of side bearings, uniform diameter of wheels, pressing of wheels on axle, minimum width of tires, windows in cab, cab heating, location of cab lights, of whistles, bells and sanders, locking and grounding of pantagraphs, voltage test of jumpers, provision of safety cut-out valve for fuel, grounding of tanks, and provision for starter for internal combustion engines, for boilers the minimum allowed factor of safety, permissible stresses in stay bolts and braces, design strength of materials and rivets, inspection and hydrostatic test of boiler, testing of stay bolts, location, testing and connection of steam gauges, number, location, and setting of safety valves, water glass and gauge equipment, connection of tubes into tube sheets of feed water appliances, etc., permitted wear limits and defects appearing in service.

References.—Railway motors, *see* 711.3; storage batteries and containers, *see* 712.2, 712.3; locomotive control apparatus, *see* 714.11; motor rating basis, standard voltages, methods of testing, safety codes for electrical equipment, *see* 710; safety devices for locomotives, *see* 726.2; brake systems and miscellaneous car parts, *see* 726.2; structural steel for locomotives, *see* 605.13; cast-iron wheels, cast-steel wheels, forged steel wheels, and tires, *see* 611.18, 611.49, 611.53; journal boxes, bearings, *see* 611.22, 692.3; brake beams, brake shoes, *see* 611.42, 611.43; couplers and cast steel parts, *see* 611.44, 611.49; axles, steel forgings, *see* 611.51, 611.52;

valves, *see* 607.6; locomotive headlights, wiring for locomotives, *see* 716.2, 715.30; turbo-generator for locomotive lighting, *see* 711.12; tolerances for metal fits, *see* 615.82.

721.2 ELECTRIC AUTOMOBILES AND TRUCKS

Industrial Truck Statistical Assn. Spark-Enclosed Construction for Electric Industrial Trucks and Tractors, 1942. To seal the enclosures of the sparking devices in such a manner that any dust or gas from surrounding atmosphere is substantially excluded or its infiltration is greatly retarded. Gives requirements for motors, controllers, contactors, switches, other sparking devices, leads or conductors, terminal boards, resistors, battery compartments, plugs and receptacles, static discharge device, warning signal, and name plate.

References.—Electric vehicle motors, *see* 711.22; storage batteries and containers, *see* 712.2, 712.3; controllers, *see* 714.11; definitions, symbols, rating basis and methods of testing motors, *see* 710; automobile parts and accessories, *see* 722.3; wiring for electric automobiles, *see* 722.32; charging plug and receptacle, *see* 715.21; industrial truck tire and rim sizes, *see* 206.5; tolerances on metal fits, *see* 615.82.

722. MOTOR TRUCKS AND AUTOMOBILES, EXCEPT ELECTRIC

722.0 GENERAL ITEMS

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Div., Safety Section. Safety Rules Governing Maintenance of Equipment and Stores Employes, 1942. Gives requirements for prevention of burns (fires, explosions); handling material, tools, and equipment; operation of trucks, tractors, cranes, hoists, and derricks; working on or about machinery, engines, cars, pipe lines, refrigerating or air conditioning units, and elevators; protection against train and engine hazards; and eye protection.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E. Recommended Practice for Air Cleaner Test Code, adopted 1941. Consists of two divisions—(1) air cleaner test code, and (2) discussion of pertinent factors not included in the code itself; absolute cleaner method and direct mounting method with descriptions of apparatus and procedure.

Society of Automotive Engineers. 1944 Handbook, Section 7—Transportation and Maintenance. S.A.E. Recommended Practices for Maintenance Instruction Cards for Motor Vehicles, approved 1943. Gives recommendations for standard practice instruction cards and for indexing and filing standard practice instructions.

Society of Automotive Engineers. 1944 Handbook, Section 7—Transportation and Maintenance. S.A.E. Recommended Practice for Uniform Motor Vehicle Operating Cost Classification, revised 1934. Provides a uniform basis for cost analysis and comparison and may be used as the basis for bookkeeping accounts. Where accounts are kept in accordance with requirements of regulatory bodies, they can usually be reclassified for analysis and comparison purposes.

Society of Automotive Engineers. 1944 Handbook, Section 7—Transportation and Maintenance. S.A.E. Standard Load and Dimension Limitations on Motor Vehicles, revised 1942. Maximum widths, heights, lengths, and weights, with outlines of the reasons on which each is based.

Society of Automotive Engineers. 1944 Handbook, Section 9—Nomenclature, Tolerances, Conversions. S.A.E. Standard Automotive Nomenclature, revised 1941. Principles and rules governing automotive nomenclature.

Underwriters' Laboratories, Inc. Standard for the Determination of Fire Hazards of Commercial Cars and Motor Trucks, 1924. Gives requirements for fuel supply system, tank mounting, carburetion, electrical equipment, and exhaust system.

U. S. Gov., Army Air Forces. Specification 20020-A; 1941. Protective Coatings and Finishes for Automotive Vehicles; General Specification for.

U. S. Gov., Dept. of Commerce, Bureau of Foreign and Domestic Commerce. Emergency Formula Governing Minimum Sizes and Weights of Commercial Motor Vehicles Which the Governors of All 48 States Have Approved for the Duration of the War.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-368. Vehicles; Gasoline Driven.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 1. Automobiles. (A) light duty, (B) general transportation, (C) medium weight, and (D) heavy weight.

U. S. Gov., Interstate Commerce Commission. Motor Carrier Safety Regulations, 1942. Rules and regulations governing qualification of employees and safety of operation and equipment of common carriers and contract carriers of passengers and property, and of private carriers of property, by motor vehicle; includes qualification of drivers, driving of motor vehicles, parts and accessories necessary for safe operation, reporting of accidents, hours of service of drivers, and inspection and maintenance. Transportation of explosives and other dangerous articles.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-0-1A; 1939. Automotive Vehicles and Trailers, Spare and Replacement Parts and Accessories; General Requirements for.

722.1 AUTOMOBILE MOTOR TRUCKS

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Tank Truck Ordinance. Suggested ordinance regulating the construction and operation of tank trucks, tank trailers, and tank semitrailers used for the transportation of flammable liquids.

National Fire Protection Assn. Tank Truck Ordinance, 1938. Suggested Ordinance for municipalities and state law, gives definitions, requirements for material, capacity, and gauge of steel tank, for joints, test, outlets, compartments, vents, valves and faucets, collision protection, emergency discharge control, grounding; tank truck fuel systems, exhaust systems, trailers and semitrailers, with diagrams.

Society of Automotive Engineers. 1944 Handbook, Section 7—Transportation and Maintenance S.A.E. Standard Certificates of Maximum Net Horsepower for Motor Trucks and Truck-Tractors, adopted 1941.

U. S. Gov., Army Air Forces. Specification 30145; 1942. Truck; Photo Lab, Type N-1.

U. S. Gov., Army Air Forces. Specification 30148; 1942. Truck; Fuel Servicing, Tractor-Trailer, Type F-1A.

U. S. Gov., Army Air Forces. Specification 30153-4; 1944. Truck; Crash, Airdrome, Type O-1.

U. S. Gov., Army Air Forces. Specification 30166; 1944. Truck; Six-Wheel, Six-Wheel-Drive, 7 1/2-Ton, for Crane Truck, Type P-1.

U. S. Gov., Army Air Forces. Specification 40601-A; 1943. Body; Telescoping, Portable Van, General Specification for.

U. S. Gov., Army Air Forces. Specification 40604 (2); 1943. Van; Technical Supply, Portable.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-5a; 1943. Truck; Six Floodlight Field Lighting.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-39; 1943. Truck; Four Floodlight Field Lighting.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Truck; Fire-Weather Forecasting.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-183. Truck; 1/2 Ton, Sedan Delivery or Panel Body.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-392. Supplement to Federal Specifications KKK-T-701a Sections B, C, D, and F. Single Rear Wheel, 1/2 Ton Sedan Delivery Truck.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-394. Supplement to Federal Specifications KKK-T-701a, Sections B, C, D, and F. Single Rear Wheel, 1 1/2 Ton Panel Body Truck.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-395. Supplement to Federal Specifications KKK-T-701a, Sections B, C, D, and F. Single Rear Wheel, 3/4 Ton Pickup Body Truck.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-396. Supplement to Federal Specifications KKK-T-701a, Sections B, C, D, and F. Dual Rear Wheel, 1 1/2 Ton Panel Body Truck.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification Nos. 21 to 29, inclusive. Trucks; All Sizes.

U. S. Gov., Federal Specification KKK-T-701a; 1933. Amendment 1; 1934. Trucks; Motor, Gasoline (Four Wheels—Two-Rear-Wheel-Drive). Gives requirements for chassis, frame, engine, cooling, lubricating, ignition, fuel systems, clutch, transmission, axles, wheels, tires, brakes, springs, controlling mechanism, body, and tests.

U. S. Gov., Federal Specification KKK-T-706; 1934. Trucks; Motor, Gasoline or Diesel Engine (Four Wheels—Four-Wheel-Drive; Six Wheels—Six-Wheel-Drive). Gives requirements for chassis, frame, power unit, engine, cooling, ignition, fuel system, muffler, clutch, transmission, axles, brakes, etc., and tests.

U. S. Gov., Federal Specification KKK-T-716; 1937. Trucks; Motor, Gasoline (1,000-Pound Pay-Load), (Four Wheels—Two-Rear-Wheel-Drive). Gives requirements for chassis, frame, engine, power unit, cooling and lubricating systems, clutch, transmission, ignition and fuel systems, propeller shaft, brakes, cab, etc., and tests.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Motor, Rail, and Water. Shipping Container Specifications. Specifications MC300, MC301, MC302, MC303, MC310, and MC320, Cargo Tanks To Be Mounted on and To Form Part of Tank Motor Vehicles for Transportation of (MC300, MC301, MC302, and MC303) Inflammable Liquids and Poisonous Liquids, Class B; (MC310) Corrosive Liquids; and (MC320) Liquefied Petroleum Gases. Covers requirements for design and construction, marking, inspection, maintenance and methods of testing. Published by American Trucking Assns., Inc., Tariff Bureau, Agent C. F. Jackson's Motor Carriers' Explosives and Dangerous Articles Tariff No.4-1941 (and Supplements Nos.1 and 2-1942.)

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-10; 1928. Truck; Servicing, Hot Oil and Water, Type D-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-52; 1933. Truck; Wrecking, Type C-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-62; 1938. Truck; Wrecking, Tractor Trailer, Type C-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-65B; 1940. Truck-Tractor; Motor, for Type C-2 Wrecking Truck, 6-Wheel Drive, 4DT.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-67; 1938. Truck; Fuel Servicing, Tractor Trailer, Type F-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-68A; 1942. Tractor-Truck; 7 1/2 Ton, 6-Wheels, 6-Wheel Drive, 4DT, for Type F-1 Fuel-Servicing Semitrailer.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-75; 1940. Truck; Fuel Servicing, Tractor-Trailer, Type F-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-76; 1940. Truck; Oil Servicing, Type L-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-84; 1943. Truck, Fuel-Servicing, Type F-3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-89; 1944. Truck; Aircraft Field Repair Shop, Type A-3A, Tractor-Trailer.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-95; 1945. Truck; Fuel Servicing, Type F-4 (Half-Track).

References.—Fire trucks, *see* 722.2; truck accessories and parts, *see* 722.3; power take off, *see* 722.34; propeller shaft midship mountings, *see* 722.34; motor truck frames, *see* 722.37

722.2 AUTOMOBILE FIRE TRUCKS

National Board of Fire Underwriters. Fire Engine Tests and Fire Stream Tables, 1938. Covers method of testing automobile fire engines for new equipment and equipment in use, based on quantity of water discharged at 120 lb. pressure; apparatus necessary, test procedure, fire stream tables, tables for various types of nozzle and hose, and computation of results of tests.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Community

Forest Fire Fighting Equipment. Covers the forest and brush fire problem, hand pumps, power pumps, motorized forest fire truck, hose, hand tools, housing and care of equipment, and availability of parts.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Municipal Fire Apparatus. Specifications for Automobile Fire Apparatus. Covers pumper (triple combination), ladder truck (city service), ladder truck (aerial), ladder truck and pumper (quadruple combination), provisions applying to all types of apparatus, information for municipal officials using specifications on municipal fire apparatus, and lists tools and appliances for pumpers, ladder trucks, and ladder truck and pumper (quadruple combination).

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Specifications for Auxiliary Pumpers. Covers provisions applying to pump assembly, special provisions for automobile truck units, special provisions for trailer units, trailer pumpers, advantages and disadvantages of trailer pumpers.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Truck; Barrel and Suppression-Crew.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Truck; Suppression-Squad.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Truck; Tank and Suppression-Crew, Light-Duty.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Trucks; Fire Pump and Tank, Heavy Duty.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-417. Crash and Fire Truck.

References.—Industrial automobile trucks, *see* 722.1; truck accessories and parts, *see* 722.3; stationary fire pumps, *see* 755.1; other fire extinguishing equipment and supplies, *see* 970 to 979.

722.3 AUTOMOBILE ACCESSORIES AND PARTS

722.30 General Items

Society of Automotive Engineers, Inc. Report on Engine Bearings; Replacement Technique for Installation or Fitting. Submitted to Vehicle Maintenance Section, Office of Defense Transportation, 1943. Covers section I, types of bearings and materials of engine bearing construction; and II, operational guide for engine bearing replacement.

722.31 Automobile Power-Plant Parts

Society of Automotive Engineers. Aeronautical Material Specification No.7310; 1941. Rings; Piston, Cast Iron. Gives requirements for composition, condition, hardness, quality, finish, elasticity, tension, circularity, light-tightness and periphery, flatness, dimensions and tolerances, marking, identification, rust-proofing, drawings, approval, reports, and rejection. Similar specifications: Army 95-28107; Navy 49R3.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice Air-Cleaning Mounting, Carburetor Air-Horns, adopted 1928. Diagram with table of dimensions for various sizes.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Carburetor Intakes, adopted 1921. Requirements for nominal diameter of air intake to take S.A.E. recommended practice for flexible steel carburetor tubing.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Insert Valve Seats, adopted 1937. Diagram and table of dimensions for bores in cylinder head and insert valve seats for nominal throat diameters from 7/8 to 2 3/4 in. for regular series (for use in passenger car engines) and heavy duty series (for use in engines in trucks, buses, tractors, and other heavy duty services).

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Automotive Type Carburetor Flanges, revised 1928. Diagrams and tables of dimensions for various sizes two-bolt, three-bolt, four-bolt, and duplex flanges.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Engine Flywheel Housing, revised 1941. Diagram with table of dimensions for S.A.E. Size Nos.00 to 6; requirements for clutch housings and disc clutch flywheels.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Engine Mounting, revised 1942. Includes diagrams of, and tables for, dimensions of engine arm sizes Nos.1 to 5, and engine trunnions of starting-crank bracket and gear cover types; and dimensioned line drawings and table of flat pad mounting dimensions for S.A.E. housing numbers 0 to 6.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Piston and Piston Pin Oversizes, revised 1941. Gives standard oversizes for pistons and oversizes of piston pin.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Piston Rings and Grooves, revised 1942. Adopted as a standard primarily for the types of internal combustion engines commonly used in automobiles, motorboats, etc. For pistons used in aircraft engines and engines not of the conventional automobile type, it may be necessary to deviate from the rings and grooves recommended, but such modifications should not be made by changing the piston ring width or radial thickness. Includes tables for piston ring and groove widths, and ring widths for cylinder diameters; formulas for ring grooves; tables for piston ring radial wall thickness and groove diameters, and piston ring radial wall thickness and groove diameters for thick wall compression rings; and S.A.E. Recommended Practice for ring joints and drain holes with tables for ring joint clearances, number of oil ring groove drain holes, size of oil ring drain holes, and "K" type ring and groove dimensions.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. Starting Motor Mountings, revised 1940. Diagrams for S.A.E. standard for flange type; S.A.E. recommended practice for outboard installation—barrel type, medium duty, and heavy duty; S.A.E. standard for inboard type; and S.A.E. recommended practice for starting motor pinions.

Society of Automotive Engineers. 1944 Handbook, Section 7—Transportation and Maintenance. S.A.E. Standard Certificates of Maximum Net Horsepower for Motor Trucks and Truck-Tractors, adopted 1941.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Fan Belts.

U. S. Gov., Treasury Dept., Procurement Div., 249B; 1940. Filters; Oil; Internal Combustion Engine. Shall be designed and suitable for operation on a by-pass oil line, and shall consist of a metal container and an interchangeable filtering element. Gives requirements for engine oil capacity, container housing, filter capacity and dimensions, efficiency; method of inspection and test; and packaging, packing, and marking.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Piston Rings.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 90-1B; 1937. Ring; Piston, for Motor Vehicle Engines.

References.—Flexible carbureter and exhaust steel tubing, *see* 607.7; acetylene head lamp, *see* 722.33; crank case drain plug, *see* 607.14; engine test codes, *see* 700; gasoline engines, *see* 705.0; tolerances on metal fits, *see* 615.82.

722.32 Automobile Electrical Equipment

American Assn. of Motor Vehicle Administrators, joint sponsor with National Conservation Bureau. American Standards Assn., D 7.1-1941. Inspection Requirements for Motor Vehicles. Minimum requirements for the mechanical condition of the vehicle for safe operation on the highway. Includes testing and inspection of head, rear, clearance, signal, marker, and adverse weather lamps, including output, focus, and aim; with diagram drawings of lamp aim inspections.

American Automobile Assn. Headlight Testing Manual. To aid garages and inspection stations in servicing lighting systems so as to produce the safest illumination possible and in determining when rejections and replacements of parts are necessary for the protection of highway users. Covers space requirements, mounting the chart, adjusting height of chart, locating the car, preliminary inspections, and headlight beam arrangements and patterns.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for 7 Mm. Distributor Nipple, revised 1941. Diagram for natural or synthetic rubber 7 mm. distributor nipple.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Electrical Instrument Binding Posts, revised 1941. Requirements for threads and table of limits for same. Relate primarily to dashboard instruments in motor vehicles.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Voltages for Diesel Electric Systems, adopted 1939. For lamps, batteries, heaters, radios, etc., in electrical systems for operation with mobile or automotive Diesel engines. Recommends nominal system ratings of 12, 24, and 32 volts.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Battery Tray Terminal Lugs, adopted 1925. Diagrams and table of dimensions for terminals Nos.2 and 0 for 3/8—16 size bolt and No.0000 for 1/2—13 size bolt.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Distributor Mounting, revised 1941. Diagrams of distributor mounting and hold-down arm and screw.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Electric Lamp Bulbs and Bases, revised 1944. Includes lamp sizes and ratings for bulb types, filament types, and prefocused types; lamp base dimensions, sealed beam headlamp units; sizes, ratings, and types; and electric light bulbs and sealed lighting units for military vehicles.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard General Automotive Type Spark Plugs, revised 1935. Diagram with tables for dimensions, plug threads, and tapped hole threads for 7/8 in.-18 and 18-1.5 mm. spark plugs; requirements for tapped hole countersink and for thread gages; and metric conversions used for values in the tables.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Generator Mounting, revised 1929. Diagrams for adapter-flange type, flange type, and base type.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Magneto Mounting, revised 1941. Diagrams with tables of dimensions for magneto coupling and shaft end, and for magneto mounting for all service type (1, 2, 4, and 6 cyl.), motorcycle and lighting plant, small stationary engine base and flange mountings; and dimensioned line diagram for flange type for tractors.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Sockets, Plugs, and Caps, revised 1937. Diagrams showing sizes and dimensions of regular and heavy duty sockets and plugs; miniature sockets; pinched-in sockets; off-set pin socket and plug; screw socket, plug, and cap; moulded cap; and metal cap.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S.A.E. Standard Starting Motor Circuits, adopted 1932.

Society of Automotive Engineers. 1944 Handbook, Section 4—S.A.E. Recommended Practice for Automobile Wiring, revised 1940. Ground return wiring systems (definitions, insulated cable, grounding, battery installation, and overload protective devices).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS97-42; 1942. Electric Supplementary Driving and Passing Lamps for Vehicles (After Market). To establish standard specifications and methods of test for supplementary driving and passing lamps (after market) for the guidance of manufacturers, distributors, and users. Covers definitions, general requirements, installation instructions, lamp bulbs, samples for test, laboratory facilities, vibration and shock test, moisture test, dust test, corrosion test, photometric test, marking, and labeling.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Cable; Ignition.

U. S. Gov., Treasury Dept., Procurement Div., 314A; 1942. Horns; Motor-Vehicle Electrically-Operated, Vibrator-Type. Covers two types—(I) medium pitch tone, single unit, with and without projector; and (II) high pitch tone, with projector, single unit. For operation with 6-volt or 12-volt storage batteries. Gives requirements for materials, workmanship, design, performance, dielectric strength and insulation resistance, brackets, and relay; methods of inspection, sampling, and tests; and packaging, packing, and marking.

References.—Storage batteries, *see* 712.2; storage battery containers and jars, *see* 712.3; storage battery terminals, *see* 712.9; storage battery trays and tray terminals for electric vehicles, *see* 721.2; electric vehicle motors, *see* 711.22; charging plug and receptacle, *see* 715.21; ignition coil and timer test, *see* 713.6; fuses and fuse clips, *see* 714.21, 714.22; rubber bushings, *see* 209.7; flexible steel conduit and tubing, *see* 715.11; nonmetallic conduit, *see* 715.13; insulated cable, magnet wire, *see* 715.41, 715.44; lamp lenses, *see* 525.4; incandescent lamps, optical tests of head lamps and tail lamps, *see* 716.12; bases, sockets, and plugs, *see* 715.21, 716.12; connectors, *see* 719.72; spark plugs and terminals, *see* 719.4; breaker contacts, *see* 714.51; starting motor pinions, *see* 611.55; insulation test, *see* 710; starting motors, automobile generators, *see* 711.22, 711.12; motor and generator brushes, *see* 711.42; meter binding posts, *see* 714.37; cable terminals, cable and conduit clips, *see* 715.34, 719.72; flexible conduit ferrules, *see* 715.11; motor coach lighting, *see* 716.39.

722.33 Automobile Parts and Fittings

American Assn. of Motor Vehicle Administrators, joint sponsor with National Conservation Bureau.: American Standards Assn., D 7.1-1941. Inspection Requirements for Motor Vehicles. Minimum requirements for the mechanical condition of the vehicle for safe operation on the highway. Includes requirements for horn, glass, windshield wiper, sleet remover, rear view mirror, directional signals, exhaust line, registration and identification plates, fuel tanks and lines, body fittings, cab, seat fittings and controls, fire extinguishers, flares, fuses, lanterns, flags, trailer mounting and coupling and trailer wiring.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Ball Studs, revised 1932. Diagrams and tables of dimensions for nuts and ball studs.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice, Crankcase Drain Plugs, revised 1932. Gives drawing with table of dimensions for sizes 1/2, 3/4, and 7/8 in. in diameter.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Fuel Pump Mounting, revised 1941. Diagrams for crankcase pads for mounting fuel pumps for passenger cars, motor coaches, trucks, and tractors.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Pressure Gage Connections, adopted 1922. Diagrams and table of dimensions for tubing diameters 1/4, 5/16, and 3/8.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Serrated Shaft Ends, revised 1944. Gives straight shafts, formulas, taper shafts, drawings, and table giving dimensions of holes and shafts for straight and taper shafts with nominal diameter from 1/8 to 3 in.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Steering-Gear Connecting-Rods, Adopted 1928. Diagrams and tables of dimensions for sockets, plugs, ball seats, and springs for nominal ball sizes 1 to 1 3/4 in.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Water-Pipe Flanges, revised 1926. Diagram with table of dimensions for nominal sizes from 1 3/16 to 2 3/16 in.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Ball and Socket Joint, adopted 1920. Diagram with table for dimensions and threads per inch (NF-2) in nine sizes from No.5 to 1/2 in. in diameter.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard for Oil Filter Mounting, adopted 1932. Diagrams for small and dual types for dimensions of the pads provided on the engine. Areas for locating the connecting oil passages are indicated.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Rod Ends and Pins, revised 1931. Diagrams and table of dimensions and dimension tolerances for light and heavy series, adjustable and plain, yokes and eyes.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard for Splined Fittings, revised 1936. Gives diagrams and table of formulas in terms of large diameter for 4, 6, 10, and 16 splines for all fits, permanent fit, to slide not under load, and to slide under load; and tables of fittings for 4 and 6 spline fittings 3/4 to 3 nominal diameter, 10 spline fittings 3/4 to 6 nominal diameter, and 16 spline fittings 2 to 6 nominal diameter.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Square Shaft Ends, revised 1921. Diagram and table of slip fits and permanent fits for square broached fittings for nominal diameters 1/4 to 4.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Taper Shaft Ends, revised 1928. Diagram and table of dimensions for taper fittings with plain or slotted nuts.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard for Thermostat Connections, revised 1941. Gives requirements for hose connections and for metallic connections.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Standard Tube Fittings, revised 1944. Diagrams and tables of dimensions of connectors (unions, elbows, and tees) and nuts for connectors—flared, refrigeration and marine, ball sleeve (compression), inverted flared, and threaded sleeve types; and pipe thread modification.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Specifications, Bureau of Federal Airways. Specification CAA-308. Traction Devices, for Automotive Equipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 91-44; 1926. Tank; Vacuum, Fuel Feed System.

References.—Drain cocks, *see* 645.4; wire cloth, *see* 603.43, 645.39; ball bearings, roller bearings, *see* 766.2; screw threads and tap drill sizes, *see* 608.0; cap screws, machine screws, wood screws, *see* 608.2; bolts, nuts, *see* 608.31, 608.32; wrench openings, *see* 615.42; lock washers, plain washers, *see* 608.6; cotter pins, *see* 608.51; woodruff keys, key slots, keyways, *see* 608.52; split and tubular rivets, *see* 645.9; brake lining, *see* 722.38; lubricator cups, oil and grease cups, threads, *see* 794; tolerances for metal fits, *see* 615.82; lamps, electric (auto), *see* 716.12.

722.34 Automobile Transmission Parts

Brake Lining Manufacturers' Assn., Inc. Automotive Data Book, 1941, with 1942-43 Supplement. Asbestos Brake Linings and Clutch Facings. Lists name, model and year of car, truck, bus, or trailer and gives B. L. M. A. catalog number and data for clutch facings and for brake lining.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Recommended Practice Propeller Shaft Midship Mounting for Truck and Motorcoach, revised 1941. Diagram and table of dimensions for three-joint propeller shaft midship mounting for tube diameters of 2, 2 1/4, 2 1/2, and 3 in.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Recommended Practice for Universal-Joint-Hubs, adopted 1921. Diagram and table of maximum and minimum lathe and ground finish hub diameters, finished lengths, and bevels for 3/4 to 2 nominal diameters.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Standard Power Take-Off, revised 1940. Diagram with mounting and gear locations applicable for all general installations of power take-off on the transmission gear box of motor trucks and tractors.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Standard V-Belts and Pulleys, revised 1939. Intended primarily for automotive applications such as fan, generator and pump drives, and where the load capacity of a single standard belt is inadequate, the capacity can usually be obtained by using standard pulleys and belts in multiple. Diagram of V-belt pulley grooves with table of V-belt and pulley dimensions for various S. A. E. sizes; recommended method of making V-belt drive layouts; method of checking V-belts; belt ride-out; diagram of notched pulley for testing fixture; and designation of belt size.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S. A. E. Recommended Practice for Clutch Facings, revised 1929. Gives diagrams and tables of sizes and dimensions for multiple-disc and single-plate clutch facings.

U. S. Gov., Treasury Dept., Procurement Div., 248A; 1939. Facings; Clutch, Metallic. Shall be of one type and of good quality. Gives requirements for construction, wearing layer, backing layer, coefficient of friction, hardness, thickness of wearing layer, density, and applicability; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-230-3; 1944. Facing; Friction, Metallic.

References.—Silent chain, roller chain, roller chain sprocket, *see* 766.1; roller and sprocket chain cutters, *see* 765; tractor power take off speed, *see* 729.5; tractor belts and pulleys, *see* 729.5.

722.35 Automobile Axles and Wheels

American Assn. of Motor Vehicle Administrators, joint sponsors with National Conservation Bureau. American Standards Assn., D 7.1-1941. Inspection Requirements for Motor Vehicles. Minimum requirements for the mechanical condition of the vehicle for safe operation on the highway. Includes requirements for wheel alignment and rear axle.

References.—Rims, cleats, and lugs for tractor wheels, *see* 729.5.

722.36 Automobile Tires and Rims

American Assn. of Motor Vehicle Administrators, joint sponsor with National Conservation Bureau. American Standards Assn., D 7.1-1941. Inspection Requirements for Motor Vehicles. Minimum requirements for the mechanical condition of the vehicle for safe operation on the highway. Includes requirements for pneumatic tires and rims of passenger cars, buses, and commercial vehicles.

Plain Washer Manufacturers' Assn. Felloe Plates, Flat, 1938. Gives dimensional requirements for two sizes of felloe plates.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Deep Well Rim contours for Wide Base Rear Tractor Tires. Recommended Practice, 1940. Dimensional drawings.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Rim Contours for Tractor and Implement Tires. Recommended Practice, 1940. Dimensional drawings for various rim contours.

Tire and Rim Assn., Inc. Agricultural Handbook, 1944. Rim Contours for Wide Base Rear Tractor Tires. Recommended Practice, 1940. Gives dimensional drawings.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Beadlock Valve Hole Details (Military Standard). Gives diagrammatic dimensional drawings.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Channel Type Beadlock Contour for Use With Divided Rim or Wheel (Military Standard). Gives diagrammatic drawing with dimensions.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Combat Tire Bead Dimensions for Use on Divided Rims or Wheels (Military Standard). Drawing and table showing bead widths for tire sizes from 6.00-16 to 14.00-24.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Combat Tires and Rims (Military Standard). Gives tire size, number of plies, and rim contour from 6.00-16, six ply to 14.00-24, 20 ply.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Commercial Tire Bead Dimensions for Use With Beadlocks on Divided Rims or Wheels (Military Standard). Gives dimensional diagram showing tire sizes, number of plies, rim contour, beadlock, bead width, and tolerances.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Lend-Lease Beadlock Valve Hole and Locater Details (Military Standard). Gives diagrams showing dimensions.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Low Type Beadlock Contours for Lend-Lease "Runflat" Tires (Military Standard). Gives diagram and table showing dimensions for various sizes.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Low Type Beadlock Contours for Use With Divided Rims or Wheels (Military Standard). Gives dimensional diagrams for use with combat tires and rims.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Recommended Maximum Skid Depths for Lend-Lease Cross-Country Tires, including Runflat Type, Recommended Practice. Gives table showing various tire sizes and maximum skid depths.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Rim Contours for Divided Type Rims or Wheels, Defense Practice. Gives dimensional drawings of various sizes.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Rim Contours for Divided Type Rims or Wheels (Military Standard). Gives dimensional drawing, valve slots for divided rims, and projection of rivet heads through divided rims.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Runflat Tire Bead Dimensions for Lend-Lease (Military Standard). Gives diagram and table showing dimensions for various sizes.

Tire and Rim Assn., Inc. Military Supplement, Nov. 1943. Typical Assembly of Combat Tire and Beadlock on Divided Rim. Diagrammatic dimensional drawing.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Load Table for Full Drop Center Rims 16 Inch Diameter (and Smaller) Low Pressure Balloon Tires. Covers rim contour and maximum recommended load for standard rim and heavy duty rim.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Rim Contours for Slow Speed Industrial Vehicles and Passenger Car Baggage Trailers, Drop Center Type, Recommended Practice. Gives diagram of contours of rims for tires.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Rim Contours for Slow Speed Industrial Vehicles and Passenger Car Baggage Trailers, 2-Piece Divided Type, Recommended Practice. Gives diagrams of contours of rims for tires.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Rim Contours for Slow Speed Industrial Vehicles, Recommended Practice. Gives diagrams of contours of rims for tires.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Standard Rim Contours for 16 Inch Diameter (and Smaller), Low Pressure Passenger Balloon Tires. Dimensional diagrams for rim contours for use on passenger cars and similar chassis.

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Wide Base Rim Contours for 16 Inch Diameter (and Smaller) Low Pressure Passenger Balloon Tires, Recommended Practice. Dimensional diagrams for rim contours for use on passenger cars and similar chassis.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Contours of Rims for Light Trucks; Drop Center Type. Gives drawings with dimensions.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Contours of Rims for Light Trucks; Semi-Drop Center Type. Gives drawings with dimensions.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Optional Bead Seat Contour for Removable Flanges of All Sizes of Truck and Bus Rims Made to Advanced Program, Experimental Practice. Gives drawing with dimensions.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Optional Fillet Contours for Truck and Bus Rims, Recommended Practice, Types A and B. Gives drawings with dimensions.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Rim Contours for Mining, Logging, and Earth Moving Vehicles, Recommended Practice. Gives drawing with table showing dimensions.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Rim Contours for Tractor and Implement Tires, Recommended Practice. Gives drawings with dimensions for various types and sizes.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Rim Contours for Truck and Bus Tires, Advanced Program, Experimental Practice. Gives drawings with dimensions for various types and sizes of rim contours.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Rim Contours for Truck and Bus Tires, Association Standard. Gives drawings with dimensions for various types and sizes of rim contours.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Valve to Brake Drum Clearance. Gives drawing with dimensions.

Tire and Rim Assn., Inc. Truck-Bus Handbook, 1944. Wide Rims for Mining, Logging, and Earth Moving Vehicles, Experimental Practice. Gives table showing tire size, permissible rim width and flange height, maximum tire section, and minimum dual spacing.

References.—Rubber tires, casings and inner tubes, *see* 206; passenger car brake drums, *see* 722.38.

722.37 Automobile Frames, Bodies, and Body Parts

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Recommended Practice for Motor Truck CA Dimensions, revised 1941. Includes nominal outside motor truck frame width and CA dimensions (distance from extreme back-of-cab to center line of rear axle) for 4- and 6-wheel motor trucks.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Recommended Practice for Spring Rebound Clips, Spacers, and Bolts, revised 1938. Diagrams and tables of dimensions for rebound clip and spacer and clip bolts and nuts for passenger cars and motor buses; and diagram and requirements for clinch type clips.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Spring Center Bolts, 1938. Diagram and table of dimensions and sizes for center bolts and nuts for spring widths from 1 1/2 to 3 1/2 and over for passenger cars and for motor trucks.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Suspension Springs for Motor Vehicles, adopted 1938. Includes definitions of leaf springs and coil springs; plate sizes and rolling tolerances for leaf springs; nomenclature, dimensions, and checking for load and rate, specified load position, and tests for parallelism of spring eyes for semi-elliptic leaf springs; and S.A.E. recommended practice for nomenclature and checking for load and rate for coil suspension springs.

U. S. Gov., Army Air Forces. Specification 30167-1; 1944. Turntable; Full Revolving, for Type P-1 Crane Truck.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.33. Stake Body; Special for Trucks.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 87. School Bus Bodies.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Panels; Metal Faced for Truck Construction.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-48C; 1937. Body and Equipment for Truck; Field Servicing, Heavy Duty, Type E-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-53A; 1934. Truck; Body and Equipment for, Field Servicing, Light-Duty, Type E-3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-60; 1935. Truck; Body and Equipment for, Field Lighting, Type J-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-74; 1940. Truck; Body and Equipment for, Balloon Tender, Type A-3.

References.—Leaf springs, rebound clips, center bolts, *see* 611.54; upholstery leather, *see* 066.7; plate glass, *see* 521.1; aluminum belt body molding, *see* 631.22; aluminum body sheets, *see* 631.23; door hinges, *see* 617.12; truck bodies and frames, *see* 722.1; body types, nomenclature, *see* 723.0.

722.38 Automobile Control Equipment

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Vacuum-Brake Manifold Connection, adopted 1928. Establishes hole diameter and thread.

Society of Automotive Engineers. 1944 Handbook, Section 4—Fabricated Materials. S.A.E. Standard Brake Lining, revised 1926. Table of thicknesses and widths.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R66-27; 1927. Automobile Brake Lining. This recommendation establishes a list of standard stock sizes of brake linings covering widths and thicknesses. Sponsored by the Society of Automotive Engineers.

U. S. Gov., Federal Specification HH-L-361a; 1941. Linings; Brake (Automotive-Use). Covers four types—(I) general purpose, medium friction, nonwoven, rigid, for use in sets; (II) light service linings, for use in combination sets; class A, medium friction, nonwoven, rigid, for use in primary or reverse shoes in combination with type I or III; class B, high friction, nonwoven, flexible, for use in combination with type I or III; (III) medium friction, woven; and (IV) high friction, woven. Gives requirements for material and workmanship, physical characteristics, sizes, tolerances, and coefficients of friction; samples for test, identification, and approval; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Governors, for Motor Vehicles.

References.—Steering gear, connecting rods, ball studs, ball and socket joints, *see* 722.33.

722.39 Miscellaneous Automobile Accessories and Parts

Society of Automotive Engineers. 1944 Handbook—S.A.E. Recommended Practice for Glazing Glass. Thickness of glass for vehicles normally operating on land. To comply with American Standard, Z26.1-1938.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Passenger Car Trailer Couplings, adopted 1938. Includes definition, coupling nomenclature, and recommendations for location, sizes, ratings, and platform.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Fifth Wheel Kingpin for Commercial Trailers and Semi-Trailers, adopted 1940. Diagram giving shape, size, dimensions, and tolerances.

Underwriters' Laboratories, Inc., 1944. Lists of Inspected Appliances Relating to Accident Hazard, Automotive Equipment, Burglary Protection. This catalog contains three lists that have been inspected by the Underwriters'. The lists are appliances inspected for accident hazard, inspected automotive appliances, and inspected burglary protection appliances. The listings are arranged alphabetically as to subject and alphabetically by name of manufacturer under each subject.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.278. Rack; Stock-Truck, Demountable.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Joint sponsor with National Bureau of Casualty and Surety Underwriters. American Standards Assn., Z26.1-1938. Safety Code for Safety Glass for Glazing Motor Vehicles Operating on Land Highways.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Mats; Floor, for Motor Trucks.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Mirrors; Rear View.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Signaling Device for Trucks.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Windshield Wipers.

U. S. Gov., Treasury Dept., Procurement Div., 249B; 1940. Filters; Oil, Internal Combustion Engine. Shall be designed and suitable for operation on a by-pass oil line, and shall consist of a metal container and an interchangeable filtering element. Gives requirements for engine oil capacity, container housing, filter capacity and dimensions, efficiency; method of inspection and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 349A; 1942. Grinders; Valve-Seat, Engine, Motor-Vehicle. Covers requirements for valve-seat grinder kits. Gives requirements for condition and interchangeability, grinding precision, grinding wheels, dielectric strength, lubrication, driver, motor, switch, cord with plug, handle, and pilots; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 493a; 1942. Creepers; Automobile. Shall be wood creepers of one type and one class suitable for supporting an operator when resting on his back while making repairs under automobiles or trucks. Gives requirements for construction and design, finish, casters, dimensions, curvature of cross members, and head rest; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 91-51A; 1942. Plate; Registration, U. S. Army.

U. S. Gov., Veterans Administration. Specification VA-M-159a; 1935. Oil Filter; Automotive.

References.—Lubricating oils, *see* 504.34; felt, *see* 365.98; rubber hose, clamps, and fittings, *see* 202.43.

722.9 MISCELLANEOUS AUTOMOBILE SUPPLIES

722.91 Gasoline and Motor Fuel

References.—*See* 503.3.

722.92 Lubricating Oil

References.—*See* 504.23, 504.34.

722.93 Anti-Freeze Liquids

U. S. Gov., Navy Dept. Specification 51C39; 1944. Compound; Antifreeze.

U. S. Gov., Treasury Dept., Procurement Div., 362A; 1941. Compound; Anti-Freeze, for the Cooling Systems of Water-Cooled Internal Combustion Engines, Nonvolatile Type. Covers one type and grade, and shall produce no more corrosion of the engine cooling system, foaming, creeping, or leaking than would occur with water. Intended as a protection against freezing at temperatures as low as minus 40°F. Gives requirements for initial boiling point, viscosity, protection, and ash content; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 365A; 1941. Compound; Anti-Freeze, for the Cooling Systems of Water-Cooled Internal Combustion Engines, Volatile Type. Shall be one type (volatile) and one grade, producing no more corrosion of engine cooling system, foaming, creeping, or leaking than would occur with water. Intended as a protection against freezing at temperatures as low as minus 40°F. Gives requirements for viscosity, protection, and ash content; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-1116; 1943. Compound; Anti-Freeze (Ethylene Glycol Type).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-1117; 1943. Compound; Re-Inhibitor, Corrosion, for Ethylene Glycol.

References.—*See* 839.9.

722.94 Valve Grinding Compound

U. S. Gov., Navy Dept. Specification 51C22b; 1939. Compound; Valve-Grinding.

U. S. Gov., Treasury Dept., Procurement Div., 457b; 1943. Compound; Valve-Grinding, Grease-Mixed and Water-Mixed. Covers two types—(I) grease-mixed and (II) water-mixed; and six grit numbers—(90) extra coarse, (120) coarse, (150) medium coarse, (180) medium, (220) medium fine, and (240) fine. Gives requirements for abrasive, containers, fineness of abrasive, lubricant for oil-mixed and binder and preservative for water-mixed; methods of sampling, inspection, and tests; and packaging, packing, and marking.

722.95 Inspection Apparatus

American Automobile Assn. Headlight Testing Manual. To aid garages and inspection stations in servicing lighting systems so as to produce the safest illumination possible and in determining when rejections and replacements of parts are necessary for the protection of highway users. Covers space requirements, mounting the chart, adjusting height of chart, locating the car, preliminary inspections, and headlight beam arrangements and patterns.

Underwriters' Laboratories, Inc., 1942. Lists of Inspected Appliances Relating to Accident Hazard, Automotive Equipment, Burglary Protection. This catalog contains three lists that have been inspected by the Underwriters'. The lists are appliances inspected for accident hazard, inspected automotive appliances, and inspected burglary protection appliances. The listings are arranged alphabetically as to subject and alphabetically by name of manufacturer under each subject.

722.96 Radiator Seal

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Radiator Seal.

722.97 Hydraulic Brake and Shock Absorber Fluid

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster

General. Specifications for Brake Fluid, for Hydraulic Brakes.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-111A; 1943. Fluid; Hydraulic Brake.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-112; 1943. Fluid; Shock Absorber (Light and Heavy).

722.99 Miscellaneous Automotive Tools

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Brake Lining Machines.

U. S. Gov., Veterans Administration. Specification VA-M-157a; 1937. Brake Relining Machine (Automotive).

723. AUTOMOBILE PASSENGER CARS, EXCEPT ELECTRIC CARS

723.0 GENERAL ITEMS

American Assn. of Motor Vehicle Administrators, joint sponsor with National Conservation Bureau. American Standards Assn., D 7.1-1941. Inspection Requirements for Motor Vehicles. Minimum requirements for the mechanical condition of the vehicle for safe operation on the highway.

American Transit Assn. Recommended Rules for Inspection of Buses, E139-34; 1934. Gives rules concerning inspection of buses and a guide chart covering limits of wear with reference to engine parts.

Society of Automotive Engineers. 1944 Handbook, Section 9—Nomenclature, Tolerances, Conversions. S.A.E. Standard Automotive Nomenclature, revised 1941. Principles and rules governing automotive nomenclature.

Underwriters' Laboratories, Inc. Standard for the Determination of Fire Hazards of Passenger Automobiles and Taxicabs, 1924. Requirements for fuel supply systems, tank, carburetion, electrical equipment, and exhaust system.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-476. Trailer Unit.

723.1 AUTOMOBILE PASSENGER CARS

723.11 Automobile Coupes

References.—Definitions, parts and accessories, *see* 723.0, 722.3.

723.12 Automobile Runabouts and Roadsters

References.—Definitions, parts and accessories, *see* 723.0, 722.3.

723.13 Automobile Sedans

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-393. Automobile; Sedan 5 Passenger, 2 Door, Supplement to Procurement Div. Specification 1700-A-239.

References.—Definitions, parts and accessories, *see* 723.0, 722.3.

723.14 Automobile Touring Cars

References.—Definitions, parts and accessories, *see* 723.0, 722.3.

723.15 Automobile Ambulances

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Ambulance, 1943. Trucks, motor, gasoline, with all-steel ambulance body; to have not less than 210 cu.in. piston displacement; not less than 122 in. wheelbase; not less than 3/4 ton payload capacity.

References.—Parts and accessories, *see* 722.3.

724. AIRCRAFT

724.0 GENERAL ITEMS

American Society of Mechanical Engineers. Joint sponsor with American Assn. for Advancement of Science, American Institute of Electrical Engineers, American Society of Civil Engineers, and Society for Promotion of Engineering Education. American Standards Assn., Z10e-1930. Aeronautical Symbols. Standard symbols for quantities used in the design of aircraft.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Airplane Fueling Operations. Recommended good practice requirements for airplane fueling at airports. Covers general requirements, filling airplane tanks, filling from underground tanks by hose, filling from trucks by hose, and filling from drums by hand pump.

U. S. Gov., Army Air Forces. Specification 40135-A; 1944. Report; Aircraft Checker's.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-102; 1943. Charts; Maintenance Instruction.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-11-1; 1944. Drawings and Data Lists; Reproducible and Other Copies of, for Aircraft, Engines, Accessories, Auxiliary Equipment, and Special Tools.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-12-1; 1944. Drawings and Data Lists; Preparation of, for Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-13-1; 1944. Drawings and Data Lists; Preparation of, for Engines, Accessories, and Other Auxiliary Equipment.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-8a-1; 1945. Handbooks; Pilots Flight Operating Instruction.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-18; 1944. Measuring and Leveling Provisions, for Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-33; 1943. Sound Treatment for Aircraft; General Specification for, Installation of.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-11a; 1944. Weight and Balance Control Data, for Airplanes.

U. S. Gov., Civil Aeronautics Board. Civil Air Regulations Part .04—Airplane Airworthiness as amended to Apr. 1, 1941. Amendments 04-3 to 04-13, inclusive, adopted Feb. 6, 1942. Includes definitions and requirements (with tables) for structural loading conditions, proof of structure, detail design and construction, equipment, powerplant installation, and miscellaneous.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-71. Bonding and Shielding of Aircraft.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-143. Test Equipment; Electrical.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-260. "Z" Marker; Cone of Silence Equipment.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-360. Trans-Pacific Communication Channels for Communication Station.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-436. Methods of Photometric Measurements.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-40043G; 1942. Model; 5-Foot Wright Field, Wind Tunnel, Airplane.

References.—Gas welding of aircraft joints, procedure, *see* 767; airdromes and landing fields, *see* 518.51.

724.1 BALLOONS

U. S. Gov., Army Air Forces. Specification 40296 (1); 1940. Data for Preliminary Design and Release for Construction of Complete Barrage Balloons.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40683; 1944. Bag; Airplane Lifting, Type F-1, Pneumatic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 99-2050F; 1937. Marking for Airships, Balloons, and Parts Thereof.

U. S. Gov., U. S. Army, Army Air Forces. Specification 99-2088; 1934. Paraffin Coating for Balloon and Airship Envelopes.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 20-69; 1925. Balloon; Target Practice.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-26; 1939. Balloon; Meteorogical, Pilot, Types ML-50, ML-51, and ML-64.

724.2 AIRCRAFT ACCESSORIES AND PARTS

724.20 General Items

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 30; 1942. Surface Roughness Designation. Gives drawings of finish symbols including basic symbol, to express maximum roughness, and to express high and low roughness limits together with notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 31; 1942. Conversion Table, Surface Roughness Designations. A list of companies agreeing to accept the N.A.S. -30 micro-inch R.M.S. equivalents for their surface finish designations. Gives name of company, synbol, name of finish, and micro-inch R.M.S. equivalent. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 48; 1942. Leveling Points. Shall be provided in the form of leveling brackets, plates, or stubs in pairs. Gives longitudinal and lateral leveling for landplanes and seaplanes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 49; 1944. Specification—Engine Controls Quick Disconnect Fittings. Covers type I, suitable for use with rod type, push-pull controls; and type II, suitable for use with cable controls. Gives requirements for construction, finish, performance, design, size, and illustrations. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 71; 1942. Symbols; Aircraft Wiring Diagram. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 78; 1944. Fitting; Quick Disconnect Tubing. Shall be suitable for use in fluid line connections. Gives requirements for construction, performance, design, size, and operation. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 190; 1944. Dimensioning; Decimal Usage for. Dimensions on all manufacturing drawings shall be expressed in inches and decimals of an inch, with certain exceptions. Give details including exceptions. Developed by National Aircraft Standard Committee.

Society of Automotive Engineers. Aeronautical Material Specification No. 2570; 1942. Engines; Aircraft, Procedure for Preparation for Storage of. Provides procedures for preparing aircraft engines to resist corrosion during shipment and for their maintenance in storage.

Society of Automotive Engineers. Aeronautical Material Specifications Nos. 2800, 2804, and 2808; 1940. Identification. Machine Parts. Castings. Forgings. Covers instructions for temporary and permanent marking of machined parts, with requirements for markings noted on drawings as "stamp," "heavy stamp," "engrave," "electric etch," "deep electric etch," "acid etch," "deep acid etch," "scribe," "heavy scribe," and "rubber stamp"; raised marks, pad, and stamped marks for castings; and raised marks, stamped marks, and approval for forgings.

Society of Automotive Engineers. Aeronautical Recommended Practice 85A; 1943. Airplane Heating and Ventilating Equipment; General Requirements. Based on practical engineering requirements for the design and testing of such types of heating and ventilating equipment as are now used on airplanes and for such as may be developed. Covers scope, heating and ventilating equipment; general, military requirements, commercial requirements, and desirable design features.

Society of Automotive Engineers. Aeronautical Recommended Practice 147; 1944. Nomenclature; Aircraft Air Conditioning Equipment. Lists 83 terms alphabetically and defines the same.

Society of Automotive Engineers, Inc. Aeronautical Recommended Practice 197A; 1945. Preservation and Packaging of Aircraft Engine Parts. Success in the packaging of engine parts, assemblies, or certain specialized parts is dependent upon judicious use of preservative materials and ingenuity in the design of the complete package. Covers cleaning, preservation and wrapping, dehydration, inner boxing or cartonizing, exterior boxing, markings, table of materials with description and use, preservation and packaging chart, and photographic examples of current methods of packaging aircraft engine components.

Society of Automotive Engineers. Aeronautical Standard 23A; 1945. Tests; Aircraft Hydraulic Systems and Components. Covers individual testing of aircraft hydraulic components, assembly line testing of aircraft hydraulic systems, and test machines for conducting these tests. Gives general requirements and details including preparations to be made prior to testing, test procedures, assembly line testing of aircraft hydraulic systems, machines for testing of aircraft hydraulic systems and components, maintenance of test machines, suggested list of test stand components, and illustration.

Society of Automotive Engineers. Aeronautical Standard 164; 1943. Service Manuals for Aircraft Engines. For the purpose of supplying all necessary instructions to accomplish the proper operation and service maintenance of the particular aircraft engines for which the manual is written. Covers scope, general requirements, and detail requirements.

Society of Automotive Engineers. Aeronautical Standard 165; 1943. Overhaul Manuals for Aircraft Engines. For the purpose of supplying all necessary instructions to accomplish the complete overhaul of the aircraft engines for which the manual is written. Covers scope, general requirements, and detail requirements.

U. S. Gov., Army Air Forces Specification 27497-A-1; 1945. Installation of Type A-1, Fuel and Oil, Pressure Transmitter.

U. S. Gov., Army Air Forces. Specification 28427A; 1944. Radiator; Coolant.

U. S. Gov., Army Air Forces. Specification 28480; 1943. Engines; Aircraft Accessory, Preparation for Storage of.

U. S. Gov., Army Air Forces. Specification 28494-1; 1944. Installation of Electronic Turbosupercharger Regulator (Type B-Series).

U. S. Gov., Army Air Forces. Specification 32044-C; 1944. Installation of Accessory Power Plants in Aircraft.

U. S. Gov., Army Air Forces. Specification 32300-C; 1944. Installation of Aircraft Electrical Equipment; General Specification for.

U. S. Gov., Army Air Forces. Specification 40638-B; 1945. Tests; Landing Gear Shock Absorber Drop.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-9a; 1944. Bulletins; Contractor Service, for Airplanes, Engines, and Accessories.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-10; 1943. Bonding; Electrical, for Air-Craft.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-84-1, 1944. Catalogs; Tools.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-85-1; 1944. Catalogs; Parts, for Airplanes, Engines, and Accessories.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-7a; 1944. Handbooks and Catalogs; Aircraft, Engines and Accessories, General Specification for Preparation of.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-11; 1942. Handbooks; Operation and Service Instruction, for Aircraft Accessories, Aircraft Engine Accessories, and Related Equipment.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-12; 1942. Handbooks; Overhaul Instruction, for Aircraft Accessories, Aircraft Engine Accessories, and Related Equipment.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-8a; 1944. Installation of Engine Charge Air Filters; Design Requirements for.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-9b; 1943. Insignia; National, for Airplane Exterior.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-21a; 1944. Interchangeability and Replaceability of Component Parts for Airplanes.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-15; 1945. Lists; Recommended Spare Parts.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-9—1; 1944. Maintenance Parts Breakdown; Airplane.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-13; 1943. Marking and Tagging; Airframe, Engine, and Accessory Maintenance Parts.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-14; (1), 1944. Wiring; Installation of Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-24105-Q; 1942. Marking for Airplanes and Airplane Parts.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-24108K; 1937. Surface; Aircraft, Application of Fabric to.

724.21 Aircraft Power Plant Parts

Society of Automotive Engineers, Inc. Aeronautical Information Report 11; 1945. Testing of Aircraft Engine Carburetors. Covers laboratory test procedure including testing of aircraft carburetors at carburetor manufacturers' plants, testing of aircraft carburetors at engine manufacturers' plants, carburetion test during full scale nacelle test conducted by the airplane manufacturers, and flight test procedure including outline of test, instrumentation, flight plans, presentation of results, evaluation of results, and engine data to be supplied before flight test.

Society of Automotive Engineers. Aeronautical Material Specification No. 3385; 1941. Markers; Ignition-Cable, Non-Metallic. Tubing closely braided from commercially white cotton or other suitable material, and coated on the inside and outside with a flexible insulating varnish or lacquer, to produce a smooth, uniform finish. Includes requirements for size, markings, tests, approval, and rejections.

Society of Automotive Engineers. Aeronautical Recommended Practice No. 71; 1944. Generator Envelope, Auxiliary Engine Driven; Mounting Pad and Drive, 8-Inch Bolt Circle. Gives drawings with notes and dimensions.

Society of Automotive Engineers. Aeronautical Recommended Practice No. 72; 1944. Mounting Flange, Pad and Drive. Accessory to Gear Box, 10-Inch Bolt Circle. Gives drawings with notes and dimensions.

Society of Automotive Engineers. Aeronautical Standard 7A; 1943. Plug; Dehydrator-Cylinder, Aircraft Engine. Gives requirements for material, workmanship, loading and packing, and includes diagrammatic drawing of two types. Similar Specifications and Drawings: Army-Navy Aeronautical Specification AN-O-P-481 and Standard Drawing AN-4062.

Society of Automotive Engineers. Aeronautical Standard No.8; 1941. Plug; Dehydrator-Crankcase, Aircraft Engine. Gives requirements for material, workmanship, operation, loading, and packing, and includes diagrammatic drawing.

Society of Automotive Engineers. Aeronautical Standard 9A; 1943. Protector and Cable Attachment. Spark Plug Terminal; Aircraft Engine. Diagrammatic dimensional drawing for types I and II.

Society of Automotive Engineers. Aeronautical Standard No.29; 1942. Ignition Shielding; Aircraft. Includes two types—(I) unfilled, (II) filled; gives general requirements for interchangeability, flexibility, mounting lugs, threads, materials, markers, bonding, coupling, joints, identification, and moisture-proofing; detailed requirements for ferrules, conduits, protective treatment, joint resistance, specific resistance, high potential performance, weight, and capacitance; samples; qualification tests; inspection tests; and diagrams.

Society of Automotive Engineers. Aeronautical Standard No.44; 1942. Starter; Mounting Pads and Drives—Types I, II, III, and IV. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard 45A, 1943. Generator; Accessory or Power Take-Off, Mounting Pad and Drive, Type I. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.46; 1944. Generator Mounting Pad and Drive; 4 Bolt. Gives drawings with dimensions and notes.

Society of Automotive Engineers. Aeronautical Standard 47A; 1944. Pump; Fuel, Mounting Pad and Drive. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard 53A; 1943. Generator; Accessory or Power Take-Off, Mounting Pad and Drive, Type II. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.56; 1941. Carburetor Control Connections, Sizes .250, .3125, and .375. Diagrammatic dimensional drawings.

Society of Automotive Engineers. Aeronautical Recommended Practices 57A, 58A, 59A, and 60A; 1942. Carburetor Envelope; Aircraft, Sizes 48, 58, 78, and 100. Diagrams, dimensions, and notes.

Society of Automotive Engineers. Aeronautical Standards Nos.62, 63, 64, 65, 66, 67, 68, and 69; 1941. Carburetor Flanges; Aircraft. Diagrammatic dimensional drawings of—(62) 2-bolt, single barrel, Nos. 3 and 4; (63) 4-bolt, single barrel, Nos.2, 3, 4, 5, 7, and 9; (64) double barrel, sizes 12 and 16; (65) double barrel, size 24; (66) double barrel, size 24, remote fuel discharge type; (67) rectangular, No.9, and size 12; (68) rectangular, sizes 24 and 30; and (69) triple barrel, size 41.

Society of Automotive Engineers. Aeronautical Standard No.70; 1941. Flange; Tube, Two-Bolt Type, Aircraft Engine. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.79; 1942. Catalogs; Spare Parts, for Aircraft Engines. For the purpose of identification, procurement, and stocking of spare parts. Covers two types—(1) final (illustrated), and (2) preliminary (unillustrated). Gives general requirements for both types; symbols, binding, part numbers, and detail requirements for both types.

Society of Automotive Engineers. Aeronautical Standard No.80; 1942. Catalogs; Overhaul Tools, for Aircraft Engines. For the purpose of identification, procurement, and stocking of tools. Covers two types—(1) final (illustrated), and (2) preliminary (unillustrated). Gives general requirements for both types; symbols, bindings, and detail requirements for both types.

Society of Automotive Engineers. Aeronautical Standard No.107; 1942. Surface Finish. Provides a method for the application of surface finish control to aircraft engine parts. Gives definitions, surface and finish, scales, lay designation, general notes, plated surfaces, and method of inspection.

Society of Automotive Engineers. Aeronautical Standard No.130; 1943. Bending Radius; Tube, Aircraft Engine. Diagrammatic drawing.

Society of Automotive Engineers. Aeronautical Standard No.131; 1943. Pads; Oil Inlet and Outlet, Types I, II, and III for Airplane Connections, Aircraft Engines. Diagrammatic dimensional drawing.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Piston Rings and Grooves, revised 1942. Adopted as a standard primarily for the types of internal combustion engines commonly used in automobiles, motorboats, etc. For pistons used in aircraft engines and engines not of the conventional automobile type, it may be necessary to deviate from the rings and grooves recommended, but such modifications should not be made by changing the piston ring width or radial thickness. Includes tables for piston ring and groove widths, and ring widths for cylinder diameters; formulas for ring grooves; tables for piston ring radial wall thickness and groove diameters, and piston ring radial wall thickness and groove diameters for thick wall compression rings; and S.A.E. Recommended Practice for ring joints and drain holes with tables for ring joint clearances, number of oil ring groove drain holes, size of oil ring drain holes, and "K" type ring and groove dimensions.

U. S. Gov., Army Air Forces. Specification 28155-B; 1939. Carburetor; Performance and Method of Determining Mixture Strength Desired of.

U. S. Gov., Army Air Forces. Specification 28469-B; 1944. Regulator; Turbo Supercharger, Electronic, General Specification for.

U. S. Gov., Army Air Forces. Specification 28470; 1942. Regulator; Turbo-Supercharger, Type B-1, Electronic.

U. S. Gov., Army Air Forces. Specification 28471; 1942. Regulator; Turbo-Supercharger, Type B-2, Electronic.

U. S. Gov., Army Air Forces. Specification 28472-A (2); 1944. Regulator; Turbo Supercharger, Type B-3, Electronic.

U. S. Gov., Army Air Forces. Specification 28473; 1942. Regulator; Turbo-Supercharger, Type B-4, Electronic.

U. S. Gov., Army Air Forces. Specification 28481; 1943. Control; Automatic Speed and Boost, General Specification for.

U. S. Gov., Army Air Forces. Specification 28492-1; 1944. Regulator; Turbo Supercharger, Electro-Mechanical, General Specification for.

U. S. Gov., Army Air Forces. Specification 28497A; 1944. Regulator; Turbosupercharger, Type C-2, Electro-Mechanical.

U. S. Gov., Army Air Forces. Specification 28500B-1; 1944. Turbosupercharger; Aircraft, General Specification for.

U. S. Gov., Army Air Forces. Specification 28502-11 (1); 1944. Turbosupercharger; Type B-11.

U. S. Gov., Army Air Forces. Specification 28502-17 (1); 1944. Turbosupercharger; Type B-17.

U. S. Gov., Army Air Forces. Specification 28502-22 (1); 1944. Turbosupercharger; Type B-22.

U. S. Gov., Army Air Forces. Specification 28502-31; 1944. Turbosupercharger; Type B-31.

U. S. Gov., Army Air Forces. Specification 28502-32; 1944. Turbosupercharger; Type B-32.

U. S. Gov., Army Air Forces. Specification 28502-33; 1943. Turbosupercharger; Type B-33.

U. S. Gov., Army Air Forces. Specification 28502-39; 1943. Turbosupercharger; Type B-39.

U. S. Gov., Army Air Forces. Specification 28503-23 (1); 1944. Turbosupercharger; Type C-23.

U. S. Gov., Army Air Forces. Specification 28505-2; 1943. Turbosupercharger; Type E-2.

U. S. Gov., Army Air Forces. Specification 28505-21; 1943. Turbosupercharger; Type E-21.

U. S. Gov., Army Air Forces. Specification 32444-A; 1944. Starter; Type G-18 (Combination Electric Inertia-Direct Cranking, 24 Volt, D.C.).

U. S. Gov., Army Air Forces. Specification 32445-A; 1944. Starter; Type G-19 (Combination Electric Inertia-Direct Cranking, 24 Volt, D.C.).

U. S. Gov., Army Air Forces. Specification 32446-A; 1944. Starter; Type G-20 (Combination Electric Inertia-Direct Cranking, 24 Volt, D.C.).

U. S. Gov., Army Air Forces. Specification 40632; 1943. Cradle; Turbo-Supercharger.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-75a-1; 1944. Coolers; Oil.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-10; 1943. Dampers; Engine Exhaust Flame.

U. S. Gov., Army-Navy Aeronautical Specification, AN-F-30a; 1944. Filters; Engine Charge Air.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-37-1; 1944. Pumps; Hand Operated Engine Primer.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-27-1; 1944. Shielding-Assemblies; Aircraft Engine Ignition System Radio.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-38—1; 1944. Starters; Aircraft Inertia, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-51; 1944. Starters; Combined Direct Cranking and Inertia, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-54; 1945. Starters; Direct-Cranking.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-25; 1944. Vibrators; Aircraft Engine Starting.

U. S. Gov., Civil Aeronautics Board. Civil Air Regulations Part 13—Aircraft Engine Airworthiness, 1941. Includes requirements for design and construction, materials, fire prevention, durability, and other airworthiness requirements and data required for type certificate.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-259. Overhaul, Removal, and Installation of Airplane Engine.

U. S. Gov., Navy Dept. Specification 85R2; 1942. Rings; Piston, Aircraft Use.

U. S. Gov., Navy Dept. Specification 86R1; 1941. Radiators; Aeronautical (for Use With Ethylene-Glycol Coolant Where Temperatures Do Not Exceed 350°F.).

References.—Aeronautic spark plugs, *see* 719.4; aircraft storage batteries, *see* 712.2; requirements for engine, *see* 724.0; tolerances for metal fits, *see* 615.82.

724.22 Aircraft Parts and Fittings

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 4; 1942 and NAS 5; 1941. End; Rod, Control, Resistance Welding Type, X1020 Steel, and X4130 Steel. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 15 and 16; 1941. Joint; Universal Male and Universal Female. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 21; 1941. Strip; Insulating, Nut, Connector Panel, Electrical. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 22; 1944. Strip; Insulating, Base, Connector Panel, Electrical. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 23; 1943. Terminal; Tank Strap, Plain. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 24; 1941. Terminal; Strap, Tank, Forked. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 25 and 26; 1941. Trunnion; Tank Strap, Threaded and Unthreaded. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 29; 1943. Strap Assembly; Tank. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 36, 37, and 38; 1942. End; Rod, Spherical Bearings, 3/16 x 1/4—28 and

3/16 x 5/16—24, Interchangeable Type. Gives drawings with dimensions, notes, and specifications. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 40; 1943. Hinge; Half, Continuous, Extruded Aluminum Alloy. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 41; 1943. Pin; Continuous Hinge. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 42 and 43; 1943. Spacers—Rivet and Spacers—Screw and Bolt. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 67, 68, and 69. Guide Fastener. NAS 67; 1943. Low Form, Cowl, Dzus Type. NAS 68; 1943. Cowl, Dzus Type. NAS 69; 1941. Cowl, Dzus Type, Dimpled Rivet Holes. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 79; 1944. Standard Indentors and Nests for Applying Mechanical Terminals. Gives drawings showing nest detail, indentor details, and pressure and clearance details together with tables giving dimensions. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 90; 1942. End; Rod, Control, Threaded, X1020 Steel. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 139 and 140; 1942. Stud; Coarse Thread and Fine Thread. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 163 and 164; 1942. Insert and Insignia; Military Control Wheel Hub Cap. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 185; 1944. Spacers; Split, Screw and Bolt. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 240 and 242; 1943. Nut-Coupling, Flared Tube, Plastic; and Nut-Lock, Flared Tube Fitting, Plastic. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 243 and 244; 1943. Cap-Flared Tube Fitting, Plastic; and Cap-Rigid Tube or Hose Fitting, Plastic. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 245, 249, and 251; 1943. Nipples; Plastic. NAS 245, Flared Tube and Pipe Thread. NAS 249, Hose and Flared Tube. NAS 251, Pipe Thread and Hose. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 246, 248, 250, and 252; 1943. Unions; Plastic. NAS 246, Flared Tube. NAS 248, Flared Tube, Bulkhead and Universal. NAS 250, Hose, Flared Tube, Bulkhead and Universal. NAS 252, Hose Bulkhead. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 247; 1943. Reducer; Flared Tube, Plastic. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, and 264; 1943. Elbows; Plastic. Covers various types including flared tube, bulkhead, bulkhead and universal, and hose and pipe thread in 90° and 45°. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 265, 266, 267, 268, 269, 270, and 271; 1943. Tees; Plastic. Covers various types of flared tube and hose tees. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 272, 273, and 274; 1943. Crosses; Plastic. Covers flared tube, hose, and hose with thread on bottom. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 275 and 276; 1943. Plug and Bleeder, Screw Thread, Plastic; and Plug, Pipe Thread, Internal Wrenching, Plastic. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 277; 1943. Protector; Flared Tube, Plastic. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Society of Automotive Engineers. Aeronautical Standard 48A; 1944. Gun Synchronizer; Mounting Pad and Drive. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standards 49A, 50A, and 51A; 1944. Pump; Vacuum or Hydraulic, Mounting Pad and Drive, Types I, II, and III. Diagrammatic dimensional drawings.

Society of Automotive Engineers. Aeronautical Standard No. 61; 1941. Primer Electrical Connection; Aircraft. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard 84A; 1944. Involute Splines. Covers fundamental principles, spline tooth nomenclature, method of dimensioning splines, basic tooth proportion, dimensions for splines, formulae, diagrams, and tables for basic tooth dimensions; and dimensions for splines for several diametrical pitches at 30-degree pressure angle.

Society of Automotive Engineers. 1944 Handbook, Section 1—Aeronautical Parts, Materials, and Codes. S.A.E. Recommended Practice for Aluminum Alloy Extruded Structural Shapes for Aircraft, adopted 1931. Diagrams of shapes with tables of sizes, dimensions, area, moments of inertia, section moduli, weight per foot, and radii of gyration for unequal angles, bulb angles, shallow channels, deep channels, bulb channels, tees, and zees.

Society of Automotive Engineers. 1944 Handbook, Section 1—Aeronautical Parts, Materials, and Codes. S.A.E. Standard Aircraft Engine Pipe Plugs, adopted 1941. Drawings and table of dimensions for countersunk hexagonal and square head types in sizes from 1/8 to 2 1/2 in.

U. S. Gov., Army Air Forces. Specification 25279 (2); 1943. Seats; Pilot's, Semi-Adjustable (Long-Range Airplanes).

U. S. Gov., Army Air Forces. Specification 27431-A; 1945. Adapter Assembly; Turbo-Supercharger Tachometer and Turbo-Supercharger Regulator Drive.

U. S. Gov., Army Air Forces. Specification 28166-C (2); 1942. Drive; Accessory Gear (Aircraft-Power Plant Driven), General Specification for.

U. S. Gov., Army Air Forces. Specification No. 28430; 1940. Valve; Fuel, Check.

U. S. Gov., Army Air Forces. Specification No. 28489; 1943. Container; Oil Filter, Aircraft.

U. S. Gov., Army Air Forces. Specification No. 28490; 1943. Cartridge; Lubricating Oil Filter, Aircraft.

U. S. Gov., Army Air Forces. Specification No. 40228-J; 1944. Strut; Aircraft Shock Absorber, Air and Oil Type, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-6—2; 1944. Brackets; High Pressure Oxygen Cylinder.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-65-1; 1943. Couplings; Hydraulic Self-Sealing.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-66b-2; 1944. Cylinders; Hydraulic Actuating.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-131; 1944. Casing; Control Cable Flexible.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-5-1; 1943. Drives; Remote Manually operated Caging, for Gyro Flux Gate Compass.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-7-2; 1944. Domes; Navigator's, Observing.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-8; 1944. Fasteners; Cowling.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-2a; 1944. Hydraulic Systems; Design, Installation and Tests of Aircraft, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-1a; 1944. Jumpers; Bonding and Current Return.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-5; 1944. Jack Pads; Design and Installation of, for Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-10; 1944. Joints; Hydraulic Swivel.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-33a; 1944. Pins; Aircraft Flat Head.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-40-1; 1944. Pulleys; Plain Bearing Control.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-60; 1944. Pulleys; Grease-Lubricated Anti-Friction Bearing Control.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-1a-1; 1944. Seats; Pilots', Adjustable, Long-Range Airplane.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-40-1; 1944. Strainers; Fuel System.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-49; 1944. Seats; Pilots', Adjustable, Short-Range Airplane.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-20-1; 1945. Tie Rods; Streamline, Round and Square.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-21a-1; 1944. Terminals; Threaded Clevis Type Tie Rod.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-49-1; 1945. Tanks; Self-Sealing Fuel.

U. S. Gov., Army-Navy Aeronautical Specification AN-WW-F-366a-2; 1945. Fittings; Fluid Connection.

U. S. Gov., Navy Dept. Specification 49C1d; 1938. Cord; Elastic, Shock-Absorber, Aircraft Use.

U. S. Gov., Navy Dept. Specification 49C7c; 1938. Cord; Linen, Braided, Aircraft Use.

U. S. Gov., Navy Dept. Specification 49C10; 1935. Casing; Control-Cable, Flexible, Aircraft Use.

724.23 Aircraft Wheels

Society of Automotive Engineers. Aeronautical Standard No. 181; 1944. Wheel and Axle Dimensions; Tail Wheel High Pressure, Straight Axle Type. Gives drawings with table showing dimensions and notes.

Society of Automotive Engineers. Aeronautical Standard No. 182; 1944. Wheel and Axle Dimensions; Tail Wheel High Pressure, Stub Axle Type. Gives drawings with table showing dimensions and notes.

Society of Automotive Engineers. Aeronautical Standard No. 183; 1944. Wheel and Axle Dimensions; Low Profile, Straight Axle Type. Gives drawings with table showing dimensions and notes.

Society of Automotive Engineers. Aeronautical Standard No. 184; 1944. Wheel and Axle Dimensions; Low Profile, Stub Axle Type. Gives drawings with table showing dimensions and notes.

Society of Automotive Engineers. Aeronautical Standard No. 185; 1944. Wheel and Axle Dimensions; High Pressure, Stub Axle Type. Gives drawings with table showing dimensions and notes.

Society of Automotive Engineers. Aeronautical Standard No. 186; 1944. Wheel and Axle Dimensions; High Pressure, Stub Axle Type, Size 24 x 5-14. Gives drawings with dimensions and notes.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. High Pressure Airplane Tires, Recommended Practice, Table AP-1. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of landing and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. High Pressure Channel Tread Airplane Tires, Recommended Practice, Table AP-1B. Gives table showing tire and rim sizes, rating, and inflated dimensions for channel tread landing wheel tires, extra high pressure channel tread landing wheel tires, and channel tread tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Low Pressure Airplane Tires, Recommended Practice, Table AP-2. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of landing wheel tires, tail wheel tires, and channel tread tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Beaching Gear Tires, Recommended Practice, Table AP-2B. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of low pressure main wheel tires, S.C. main wheel tires, low pressure tail wheel tires, and S.C. tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Extra Low Pressure Airplane Tires, Recommended Practice, Table AP-3. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of landing wheel tires and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Smooth Contour Airplane Tires, Recommended Practice, Table AP-5. Gives table of rim and tire dimensions, load ratings, and types of valves for various sizes of landing wheel tires and tail wheel tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Knurling on Airplane Rims, Recommended Practice. Gives drawing and table giving size, method, and knurl for high pressure, extra high pressure, low pressure, and smooth contour rims.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Method of Dimensioning and Tolerance Requirements Rim Contours for Airplane Tires. Gives drawing and tables showing inspection tolerances for airplane rims except S.C. rims and inspection tolerances for rim diameters.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Rim Contours for S.C. Airplane Tires. Gives drawings of rims with tables showing dimensions for smooth contour airplane tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Rim Contours for 65 Inch S.C. 18 and 22 Ply Airplane Tires. Gives drawings of rim with table showing dimensions for 65 in. smooth contour 18 and 22 ply airplane tires.

Tire and Rim Assn., Inc. Airplane Handbook, 1944. Standard Rim Contours for High Pressure and Low-Pressure Airplane Tires. Gives drawings of rims with tables showing dimensions for high pressure and extra high pressure airplane tires and high pressure tail wheel tires.

U. S. Gov., Army Air Forces. Specification 25269-B (3); 1942. Axles; Aricraft Landing Wheels.

U. S. Gov., Army Air Forces. Specification 25273; 1938. Skis; Wheel, Retractable, General Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-25257; 1940. Wheel; Tail, for Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-25272; 1943. Wheel; Auxiliary, Smooth Contour, for Aircraft.

References.—Airplane tires, *see* 206.2.

724.24 Aircraft Propellers

Society of Automotive Engineers. Aeronautical Standard 41A; 1943. Propeller Shaft Ends; Single Rotation. Various diagrammatic drawings and tables giving dimensions.

Society of Automotive Engineers. Aeronautical Standard No.42; 1944. Cap; Thread Protector; Single and Dual Propeller Shafts. Black cellulose acetate material. Drawing with table giving dimensions.

Society of Automotive Engineers. Aeronautical Standard No.43; 1942. Governor; Propeller, Mounting Pad and Drive. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.90; 1942. Propeller Blades; Aluminum Alloy, Shank Dimensions for. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.91; 1943. Propeller Shaft Ends; Dual Rotation, Propeller Supplied Bearing. Various diagrammatic drawings and tables giving dimensions.

Society of Automotive Engineers. Aeronautical Standard No.92; 1943. Cones; Front, Propeller Hub. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.93; 1943. Cones; Rear, Propeller Hub. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.94; 1943. Snap Ring; Non-Controllable Propeller Hub. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard Nos. 126 and 127; 1943. Propeller Shaft End. Gives dimensional drawings with notes for 126 (taper type—number 0) and 127 (flanged type—Nos. 1, 2, and 3).

Society of Automotive Engineers. Aeronautical Standard Nos.128 and 129; 1943. Propeller Hub; Flanged, Spline Type. Gives dimensional drawings with notes for 128 (No.7 1/2) and 129 (No.10).

Society of Automotive Engineers. Aeronautical Standard No.160; 1944. Collar; Propeller Shaft, Shipping. Gives drawings with table showing dimensions and notes covering materials.

Society of Automotive Engineers. Aeronautical Standard No.161; 1944. Lifting Eye; Propeller Shaft. Gives drawings with table showing dimensions and notes.

Society of Automotive Engineers. Aeronautical Standard No.170; 1944. Cap; Thread Protector (Inboard), Dual Propeller Shafts. Material to be aluminum die casting. Gives drawings and table showing dimensions.

Society of Automotive Engineers. Aeronautical Standard No.172; 1944. Nut; Propeller Shaft, Shipping. Gives drawing with table showing dimensions and notes.

Society of Automotive Engineers. Aeronautical Standard No.173; 1944. Cap; Propeller Shaft, Shipping. Gives drawings with table showing dimensions and notes.

Society of Automotive Engineers, Inc. Aeronautical Standard No.178; 1945. Two-Speed Propeller Reduction Gear Control. Applicable to all engines that incorporate two-speed propeller reduction gears. Covers governor mounting pad provisions, engine thrust cover plate provisions, and gives dimensional drawings.

Society of Automotive Engineers. Aeronautical Standard No.180; 1944. Propeller Hub; Single Rotation. Gives drawings, notes, and table showing dimensions.

U. S. Gov., Army Air Forces. Specification 29538 (3); 1944. Blank; Propeller, Compressed Wood.

U. S. Gov., Army Air Forces. Specification No. 29540; 1944. Blades; Detachable, Propeller (Laminated Veneer, Uncompressed), General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-3; 1943. Hubs; Fixed Pitch Wood Propeller and Test Club.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-18-1; 1943. Lumber; Aircraft Propeller.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-15a-1; 1943. Propellers and Test Clubs; Fixed-Pitch Wood.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-21-1; 1944. Propellers; General Specification for Ground Adjustable.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-22-2; 1944. Propellers; General Specification for Controllable Pitch.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-23; 1943. Propellers; Installation Model Specification (Instruction for Preparation).

U. S. Gov., Army-Navy Aeronautical Specification AN-P-24; 1943. Propellers; Type Test of.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-25-2; 1944. Propeller Blades; General Specification for Solid, Aluminum Alloy.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-27-1; 1944. Propeller Blades; General Specification for Steel.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-28-1; 1944. Propeller Hubs; General Specification for Ground-Adjustable and Controllable Pitch.

U. S. Gov., Civil Aeronautics Board. Civil Air Regulations 14—Aircraft Propeller Airworthiness, 1942. Includes general provision for rating, airworthiness requisites, and requirements for hubs and blades, testing facilities, military propellers, commercial propellers, design requirements, tests, data required, and other requirements for airworthiness.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-29500H; 1927. Propeller; Wood, General Specification.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-2952C-A; 1932. Blade; Propeller, Master, Solid Aluminum Alloy, General Specification.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-40269; 1941. Spinner Anti-Icing; Slinger Ring, Propeller, General Specification.

724.25 Aircraft Control Equipment

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 6, 7, 8, and 9; 1941. Manifold—De-Icer. NAS 6, Single Port. NAS 7, Double Port. NAS 8, Triple Port. NAS 9, Four Port. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 34; 1942. Pulley; 3/32 Diameter Engine Control Cable, Anti-Friction. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 35; 1942. Lock; Cable, Pulley, 3/32 Diameter Engine Control Cable. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 91, 92, and 93; 1942. Rod Assembly; Control, 1/4 Solid, Steel. NAS 91, Adjustable Clevis Ends. NAS 92, Adjustable Clevis and Bearing Ends. NAS 93, Adjustable Bearing Ends. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 94; 1944. Rod-Control; 1/4 Solid Steel. Gives drawing with notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 95, 96, 98, 99, 100, 103, 104, 105, 106, 107, and 108; 1942. Rod Assembly; Control, Welded Steel Tube. NAS 95, 3/8 O.D. NAS 96, 3/8 O.D., Fixed Clevis and Adjustable Bearing Ends. NAS 98, 3/8 O.D., 1/4 Adjustable Clevis Ends. NAS 99, 3/8 O.D., 1/4 Adjustable Clevis and Bearing Ends. NAS 100, 3/8 O.D., 1/4 Adjustable Bearing Ends. NAS 103, 1.2 O.D., 1/4 Adjustable Clevis Ends. NAS 104, 1/2 O.D., 5/16 Adjustable Clevis Ends. NAS 105, 1/2 O.D., 1/4 Adjustable Clevis and Bearing Ends. NAS 106, 1/2 O.D., 5/16 Adjustable Clevis and Bearing Ends. NAS 107, 1/2 O.D., 1/4 Adjustable Bearing Ends. NAS 108, 1/2 O.D., 5/16 Adjustable Bearing Ends. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 97, 101, 109, and 110; 1942. Welded Assembly-Steel Tube. NAS 97, 3/8 O.D., Clevis and Threaded Rod Ends. NAS 101, 3/8 O.D., Threaded Rod Ends. NAS 109, 1/2 O.D., 1/4 Threaded Rod Ends. NAS 110, 1/2 O.D., 5/16 Threaded Rod Ends. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 111, 112, 113, 116, 117, and 118; 1942. Rod Assembly-Control; Riveted Tube, Aluminum Alloy. NAS 111, 3/8 O.D., 1/4 Adjustable Clevis Ends. NAS 112, 3/8 O.D., 1/4 Adjustable Clevis and Bearing Ends. NAS 113, 3/8 O.D., 1/4 Adjustable Bearing Ends. NAS 116, 1/2 O.D., 1/4 Adjustable Clevis Ends. NAS 117, 1/2 O.D., 1/4 Adjustable Clevis and Bearing Ends. NAS 118, 1/2 O.D., 1/4 Adjustable Bearing Ends. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 114 and 119; 1942. Riveted Assembly-Tube; Aluminum Alloy, Threaded Rod Ends. NAS 114, for 3/8 O.D. NAS 119, for 1/2 O.D. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 120, 121, 122, 123, 124, 125, 126, and 168; 1943. Knob-Control. NAS 120, 3/4-Inch Spherical, Plastic. NAS 121, 1-Inch Spherical, Plastic. NAS 122, 1 1/4-Inch Spherical, Plastic. NAS 123, 1 Diameter x 5/8 Oval, Plastic. NAS 124, 1 1/8 Diameter x 1 Horizontal, Semi-Round, Plastic. NAS 125, 1 1/8 Diameter x 1 3/16 Angular Semi-Round, Plastic. NAS 126, 1 1/8-Inch Cubical, Plastic. NAS 168, 1-Inch Diameter, Knurled Plastic. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 127; 1942. Button; Control Knob, 1/2 Diameter, Luminous Letter. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 128; 1942. Filler; Control Knob, Lever Slot. Gives drawing with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 129; 1942. Data; Standard, Control Knob Engineering Reference. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 160; 1942. Wheel; Control, Pilots', Military, Aileron. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 161; 1942. Cap Assembly; Military Control Wheel Hub. Gives drawing with notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 162 and 167; 1942. Cap; Military Control Wheel Hub and Trigger Switch Cavity, Military Control Wheel. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standards NAS 165 and 166; 1942. Switch, Gun, Military Control Wheel; and Bomb Release and Radio, Military Control Wheel. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 170; 1942. Clevis; Engine Control Rod, Adjustable. Gives drawings with dimension and notes. Developed by National Aircraft Standard Committee.

Society of Automotive Engineers. Aeronautical Standard No.73; 1942. De-Icer; Attachment Assemblies, Inflatable Type. To describe and illustrate the use of standard parts which have been found more suitable for the installation of de-icers and which are widely used on all sizes and types of aircraft. Installation procedure and diagrammatic drawings.

Society of Automotive Engineers. Aeronautical Standard No.74; 1942. Fairing; De-Icer Attachment, for Straight Lengths. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.75; 1943. Peg; De-Icer Positioning. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No.76; 1942. Rivnut; De-Icer Attachment, Keyless. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Recommended Practice, 89; 1943. Temperature Control Equipment; Automatic Airplane Cabin. Based on practical engineering requirements for such temperature controls as are now used on aircraft and for such as may be developed. Covers scope, automatic temperature controls; general, military requirements, commercial requirements, and desirable design features.

Society of Automotive Engineers. Aeronautical Standard No.106; 1942. Rivnut; De-Icer Attachment, Keyed. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Recommended Practice 148; 1943. Nomenclature Aircraft Ice Elimination Equipment. Covers basic definitions, propeller ice elimination equipment, wing and empennage ice elimination equipment, and windshield ice elimination equipment.

U. S. Gov., Army Air Forces. Specification 24823; 1943. Trigger; Gun Firing, Type A-1.

U. S. Gov., Army Air Forces. Specification 24841 (1); 1944. Control; Pilot Director Indicator, Type A-1.

U. S. Gov., Army Air Forces. Specification 24867-3; 1944. Control; Projector Release, Type A-1, 24 Volts, D.C.

U. S. Gov., Army Air Forces. Specification 24869 (A); 1945. Switch; Bomb Release, Type D-2.

U. S. Gov., Army Air Forces. Specification 24895-1; 1944. Solenoid; Type G-19, Aircraft, 24 Volts, D.C.

U. S. Gov., Army Air Forces. Specification No.24901; 1944. Switch; Control, Type B-6 (Stick).

U. S. Gov., Army Air Forces. Specification No.24910; 1943. Deflectometer, for Type A-3 Gun Turret.

U. S. Gov., Army Air Forces. Specification No.24921; 1944. Control; Bomb Rack, for Type R-2 Fragmentation Bomb Rack.

U. S. Gov., Army Air Forces. Specification 24932 (1); 1944. Solenoid; Type G-20, 24 Volts, D.C.

U. S. Gov., Army Air Forces. Specification 24973-1; 1944. Control; Projector Release, Type A-2, 24 Volts, D.C.

U. S. Gov., Army Air Forces. Specification 27330-A; 1943. Installation of Type A-5 Aircraft Automatic Pilot, General Specification for.

U. S. Gov., Army Air Forces. Specification No.27446; 1945. Accessories, for Types F-1 and F-2 Automatic Pilots.

U. S. Gov., Army Air Forces. Specification No.27447; 1945. Amplifier; Single Channel, Type A-1 (Integral, Aircraft).

U. S. Gov., Army Air Forces. Specification No.27453; 1945. Amplifier; Multiple Channel, Type B-1 (Integral, Aircraft).

U. S. Gov., Army Air Forces. Specification No.27455; 1945. Servo; Type E-1, for Aircraft.

U. S. Gov., Army Air Forces. Specification No.27456; 1945. Controller; Turn and Pitch, Type A-1, for Aircraft.

U. S. Gov., Army Air Forces. Specification No.27500; 1944. Pilots; Aircraft Automatic, General Specification for.

U. S. Gov., Army Air Forces. Specification No.27584; 1945. Pilot; Aircraft Automatic, Type F-1.

U. S. Gov., Army Air Forces. Specification No.27593; 1945. Servo; Type E-2, for Aircraft.

U. S. Gov., Army Air Forces. Specification No.27595; 1945. Amplifier; Multiple Channel, Type B-2, for Aircraft.

U. S. Gov., Army Air Forces. Specification No.32472; 1944. Control; Inverter Changeover, Type A-1, Automatic.

U. S. Gov., Army Air Forces. Specification 40619 (2); 1943. Control; Push-Pull, Flexible.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-2; 1942. Brake Systems; Aircraft, Design of.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-5-1; 1944. Instrument Systems; Installation of, Vacuum Operated.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-20; 1943. Indicators; Engine Synchroscope.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-9-1; 1945. Joints; Aircraft Control, Universal.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-6a; 1944. Regulators; Hydraulic Pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-8a-1; 1943. Signals; Landing Gear Audible Warning.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-36a; 1943. Transmitter Assemblies; Fuel and Oil Pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-6-1; 1943. Wheel and Brake Assemblies; Aircraft.

U. S. Gov., Civil Aeronautics Board. Civil Air Regulations Part 15—Aircraft Equipment Airworthiness as amended, 1940. Amendment 15-1; 1942. Includes provision for rating, classification of items of equipment, factors affecting certification or approval, and requirements for landing gear equipment, landing gear wheels, seaplane floats, skis, navigation appliances, position lights, landing flares, safety equipment and belts, parachutes, and control and structural units.

724.26 Aeronautical Instruments

American Standards Assn., C 75.11-1944. Crystal Unit CR-1 ( )/AR (American War Standard). For the purpose of facilitating production of crystal units. Gives applicable specifications and drawings, classification, material and workmanship, general requirements, detail requirements; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment; and requirements applicable to individual government departments.

Society of Automotive Engineers. Aeronautical Standard 10A; 1943. Humidity Indicator. Dimensional diagrammatic drawings with instructions.

Society of Automotive Engineers. Aeronautical Standard No. 54; 1941. Tachometer Drive; Type I. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard 55A-1944. Tachometer; Mounting Pad and Drive, Type II. Diagrammatic dimensional drawing.

Society of Automotive Engineers. Aeronautical Standard No. 167; 1943. Chart; Humidity Indicator, Color Comparison. This chart gives colors indicating relative humidity as shown by humidity indicator AS10A.

Society of Automotive Engineers. 1944 Handbook, Section 1—Aeronautical Parts, Materials, and Codes. S.A.E. Standard Aircraft Thermometer Bulbs, revised 1938. Diagrams showing size and dimensions.

U. S. Gov., Army Air Forces. Specification No. 24671; 1940. Globe; Field of Fire, 10-Inch.

U. S. Gov., Army Air Forces. Specification No. 24933; 1944. Computer; Sighting Angle, Type J-1.

U. S. Gov., Army Air Forces. Specification No. 24934; 1944. Computer; Sighting Angle, Type J-2.

U. S. Gov., Army Air Forces. Specification 27314 (2); 1941. Valve; Air Vapor Control.

U. S. Gov., Army Air Forces. Specification 27350-B-1; 1944. Indicator; True Airspeed, Type G-1, Aircraft, Pitot-Static.

U. S. Gov., Army Air Forces. Specification 27357-A; 1942. Indicator; Rate of Climb, Type A-8, Aircraft.

U. S. Gov., Army Air Forces. Specification No. 27452; 1945. Indicator; Master Direction, Type N-1, for Aircraft.

U. S. Gov., Army Air Forces. Specification No. 32369; 1941. Signal Assembly; Type D-4, Stalling Speed, Pitot-Static.

U. S. Gov., Army Air Forces. Specification No. 27377; 1942. Tube; Airspeed, Pitot, Type F-1, Aircraft, 12 Volts.

U. S. Gov., Army Air Forces. Specification 27380-B; 1944. Installation of Pitot Tube and Flush-Mounted Static Tube; General Specification for.

U. S. Gov., Army Air Forces. Specification 27388 (1); 1942. Tube; Airspeed, Pitot, Type F-2, Aircraft, 12 Volts.

U. S. Gov., Army Air Forces. Specification 27393-A (1); 1943. Indicator; Turn, Type C-1, Directional Gyro, Aircraft.

U. S. Gov., Army Air Forces. Specification 27394-A (2); 1944. Indicator; Flight, Type E-1, Aircraft, Gyro-Horizon.

U. S. Gov., Army Air Forces. Specification 27397-1; 1943. Barograph; Type B-2, Aircraft.

U. S. Gov., Army Air Forces. Specification No. 27398; 1943. Indicator; Bank and Turn, Type A-13, Aircraft.

U. S. Gov., Army Air Forces. Specification No. 27414; 1942. Indicator; Rate of Climb, Type A-9, Aircraft.

U. S. Gov., Army Air Forces. Specification 27425-A; 1944. Indicator; Rate of Climb, Type C-4, Aircraft.

U. S. Gov., Army Air Forces. Specification 27442 (1); 1944. Tachometer; Electric, Type E-16 (R-4 Series Helicopters).

U. S. Gov., Army Air Forces. Specification No. 27443; 1944. Tachometer; Electric, Type E-17 (R-5 Series Helicopters).

U. S. Gov., Army Air Forces. Specification No. 27444; 1944. Tachometer; Electric, Type E-18 (R-6 Series Helicopters).

U. S. Gov., Army Air Forces. Specification 27475-A-1; 1944. Meter; Fuel Flow, Type A-4 (Remote Indicating-Autosyn) (Aircraft, 26 Volts, 400 Cycles).

U. S. Gov., Army Air Forces. Specification 27476-A-1; 1944. Meter; Fuel Flow, Type A-5 (Remote Indicating-Autosyn) (Aircraft, 26 Volts, 400 Cycles).

U. S. Gov., Army Air Forces. Specification 27477-A-1; 1944. Meter; Fuel Flow, Type A-6 (Remote Indicating-Autosyn) (Aircraft, 26 Volts, 400 Cycles).

U. S. Gov., Army Air Forces. Specification No. 27481; 1944. Machmeter; Type A-1, Aircraft (2 3/4-Inch Round Dial, Pitot Static).

U. S. Gov., Army Air Forces. Specification No. 27489; 1944. Indicator; Bank and Turn, Type A-14, Aircraft.

U. S. Gov., Army Air Forces. Specification No. 27493; 1943. Signal Assembly; Carbon Monoxide, Type K-1, Aircraft.

U. S. Gov., Army Air Forces. Specification 27495 (1); 1944. Tachometer; Electric, Type E-15, for Aircraft Turbo Supercharger.

U. S. Gov., Army Air Forces. Specification 27512-1; 1945. Indicator; Airspeed, Type F-4, Aircraft.

U. S. Gov., Army Air Forces. Specification No.27532; 1944. Tachometer; Bombsight Disc Speed, Type F-1, Hand Held.

U. S. Gov., Army Air Forces. Specification 27533-1; 1944. Tachometer; Bombsight, Rotor Speed, Type F-2, Hand Held.

U. S. Gov., Army Air Forces. Specification No.27539; 1944. Generator; Tachometer, Aircraft, Two Pole Type, General Specification for.

U. S. Gov., Army Air Forces. Specification No.27540; 1944. Indicators; Electric Tachometer, Percent Speed Type, General Specification for.

U. S. Gov., Army Air Forces. Specification No.27541; 1944. Tachometer; Electric, Type E-21, Single, Aircraft.

U. S. Gov., Army Air Forces. Specification No.27552; 1944. Trainer; Navigation, Type G-3, Dead Reckoning.

U. S. Gov., Army Air Forces. Specification No.27553; 1944. Synchronizer, for Type A-5 Aircraft Automatic Pilot.

U. S. Gov., Army Air Forces. Specification 27560-A; 1945. Tachometer; Electric, Type E-23 A, Aircraft.

U. S. Gov., Army Air Forces. Specification No.27583; 1944. Computer; Course and Distance, Type A-5, for Mercator Solution.

U. S. Gov., Army Air Forces. Specification No.27606; 1944. Altimeter; Type C-17, Aircraft.

U. S. Gov., Army Air Forces. Specification 27987-A (3); 1943. Table; Pressure-Differential, for Airspeed Indicators.

U. S. Gov., Army Air Forces. Specification 32388-A; 1942. Signal Assembly; Altitude Warning, Type H-1.

U. S. Gov., Army Air Forces. Specification No.32496; 1944. Instruments; Alternating Current, 400 Cycle, Aircraft, General Specification for.

U. S. Gov., Army Air Forces. Specification 40389 (1); 1942. Indicator; Oxygen System, Flow, Type A-1, Aircraft.

U. S. Gov., Army Air Forces. Specification No.40404; 1942. Indicator; Cone Wind, Type A-4.

U. S. Gov., Army Air Forces. Specification No.40487; 1942. Kit; Oxygen Testing, Type K-1, Squadron-Aircraft.

U. S. Gov., Army Air Forces. Specification No.40615; 1943. Oximeter, for Measurement of Arterial Oxygen Saturation.

U. S. Gov., Army Air Forces. Specification 40673-A; 1944. Kit; Aircraft Electric Weighing, Type V-1.

U. S. Gov., Army Air Forces. Specification No.40762; 1944. Tester; Selsyn Instrument, Standard and Field.

U. S. Gov., Army Air Forces. Specification No.40772; 1944. Tester; Magnesyn Instrument, Field.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-2-1; 1942. Altimeters; Barometric Index, Pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-15a; 1944. Amplifiers; Air Position Indicator.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-19; 1944. Bulbs; Electrical Resistance Type Thermometer (-70° C. to +150° C.).

U. S. Gov., Army-Navy Aeronautical Specification AN-C-74a; 1942. Computers; Dead Reckoning.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-90a; 1943. Computers; True Airspeed.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-91a; 1944. Computers; Altitude Correction.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-97a; 1944. Controllers; Air Position Indicator.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-129-2; 1944. Computers; Air Position Indicator.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-2b-1; 1944. Gages; Aircraft Pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-16a; 1944. Generators; Electric Tachometer.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-1a; 1944. Indicator; Tetrahedral Wind Direction.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-2a; 1944. Instruments and Instrument Boards; Installation of.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-3a-1; 1944. Indicators; Electric Tachometer.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-4—1; 1944. Instrument Systems; Installation of, Pitot Static Tube Operated.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-6-1; 1944. Indicators; Thermocouple Thermometer.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-7a-1; 1945. Indicators; Gyro Flux Gate Compass Master.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-12; 1943. Indicators; Oxygen Flow.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-13; 1943. Inclinometers; Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-15-1; 1944. Indicators; Electric Turn and Bank.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-22a-1; 1944. Indicating Assemblies; Air Position.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-23; 1944. Indicator Assemblies; Wind Cone, Unlighted and Externally Lighted.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-28; 1944. Indicators; Directional Gyro.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-29-1; 1944. Indicators; Gyro Horizon.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-17; 1944. Meters; Gyro Stabilized Drift.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-5a-2; 1944. Position Indicating Assemblies; Electrical, Wheels and Flaps.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-53a-1; 1944. Pumps; Air Position Indicator.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-21; 1943. Signals; Oxygen Warning, High Pressure System.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-26-1; 1944. Signals; Daytime Drift.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-46; 1944. Shafts; Tachometer Flexible Drive.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-1a; 1943. Tubes; Electrically Heated, Pitot Static.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-18a-1; 1944. Trainers; Instrument, Ground.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-24a-1; 1945. Transmitters; Gyro Flux Gate Compass.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-44; 1944. Tubes; Electrically Heated, Pitot.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-75; 1944. Thermocouples; Engine Cylinder, Bayonet Type.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-76; 1944. Thermocouples; Aircraft Engine Spark Plug Gasket Type.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-A-96-2; 1943. Accelerometers; Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-A-461-2; 1944. Altimeters; Pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-I-518-3; 1944. Indicators; Rate-of-Climb.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-I-522a-2; 1944. Indicators; Thermometer, Electrical-Resistance Type.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-I-525-2; 1944. Indicators; Turn and Bank.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-T-791-1; 1943. Tubes; Pitot-Static, Unheated.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-17. Mica Dielectric Capacitor.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-199. Instrument Landing Specifications (8 Sections).

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-277. Monitoring Equipment; Modulation.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-399. Mountings; Resistor.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-27335-B; 1944. Indicator; Airspeed, Type F-2A, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-27751-A; 1942. Computer; Time and Distance, Type D-3, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-27809-A; 1940. Gage; Oil Pressure, Type B-5, Aircraft.

References.—Barometers and altimeters, *see* 917.2.

724.27 Parachutes and Equipment

U. S. Gov., Army Air Forces. Specification 26536-B; 1944. Band; Parachute Suspension Line Retaining.

U. S. Gov., Army Air Forces. Specification No. 40470; 1943. Parachute; Type B-8, Back—Complete.

U. S. Gov., Army Air Forces. Specification No. 40668; 1943. Parachute; Attachable, Type A-3.

U. S. Gov., Army Air Forces. Specification No. 40730; 1944. Parachute; Complete Attachable Chest, Type A-4.

U. S. Gov., Army Air Forces. Specification No. 40731; 1944. Parachute; Seat, Type S-5, Complete.

U. S. Gov., Army Air Forces. Specification No. 40732; 1944. Parachute; Type B-9, Back—Complete.

U. S. Gov., Army Air Forces. Specification No. 40744; 1944. Parachute; Training, Type T-7, Troop—Complete.

U. S. Gov., Army Air Forces. Specification No. 40912; 1945. Parachute; Complete Attachable Chest, Type A-5.

U. S. Gov., Army Air Forces. Specification No. 40913; 1945. Parachute; Complete Back, Type B-10.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-P-121a; 1944. Parachutes; General Specification for.

U. S. Gov., U. S. Army Air Forces. Specification 94-40074; 1928. Parachute; Complete Seat, Type S-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40358; 1941. Parachute; Training, Type T-5, Troop—Complete.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40433; 1943. Tower; Parachute Drying, Type A-1.

724.29 Miscellaneous Aircraft Accessories and Parts

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 2; 1943. Fittings; Lubrication. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 3; 1941. Plate; Bolt, Locking. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 11; 1942. Valve Assembly; Flapper. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 13; 1941. Seal; Control Tube, Bellows Type. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 14; 1941. Retainer; Bellows Type Seal, Control Tube. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 27; 1943. Turnbuckle; Tank Strap. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 50 and 51; 1942. Rings; Retainer, Internal Type, for Bearing and Shaft Housings, and External Type, for Bearings and Shafting. Gives drawings with dimensions. Developed by National Aircraft Standard Committee.

Aeronautical Chamber of Commerce of America, Inc. National Aircraft Standard NAS 141 and 142; 1942. Tapped Holes for Studs. In aluminum alloy and soft metals, and in steel and hard metals, including brass. Gives drawings with dimensions and notes. Developed by National Aircraft Standard Committee.

Society of Automotive Engineers. Aeronautical Recommended Practice 86; 1943. Heater; Airplane, Exhaust Hot Air Type. Based on practical engineering requirements for such exhaust type heaters as are now used on airplanes and for such as may be developed. Covers scope, exhaust hot air type heater; general, military requirements, commercial requirements, and desirable design features.

Society of Automotive Engineers. Aeronautical Recommended Practice 87; 1943. Heater; Airplane, Steam Type. Based on practical engineering requirements for the design and testing of such types of steam heaters as are now used on airplanes and for such as may be developed. Covers scope, steam type heater; general, military requirements, commercial requirements, and desirable design features.

Society of Automotive Engineers. Aeronautical Recommended Practice 88; 1943. Heater; Airplane, Liquid Type. Based on practical engineering requirements for such liquid type heaters as are now used on airplanes and for such as may be developed. Covers scope, liquid type heater; general, military requirements, commercial requirements, and desirable design features.

Society of Automotive Engineers. Aeronautical Recommended Practice 143; 1943. Heaters; Airplane, Internal Combustion Types. Based on practical engineering requirements for such internal combustion type heaters as are now used on airplanes and for such as may be developed to meet later requirements. Covers internal combustion type heaters; general, military, and commercial requirements, and desirable design features.

U. S. Gov., Army Air Forces. Specification 17012-A; 1945. Markers; Fluorescent, Instrument Identification and Range.

U. S. Gov., Army Air Forces. Specification 24573-B; 1943. Rack; Bomb (Bombardment Type Airplane), General Specification for.

U. S. Gov., Army Air Forces. Specification 24799 (2); 1944. Rack; Parachute Fragmentation Bomb, Type R-1.

U. S. Gov., Army Air Forces. Specification 24800-3; 1944. Rack; Bomb, Type R-2.

U. S. Gov., Army Air Forces. Specification 24809; 1943. Mount; Bomb Sight, Type B-7.

U. S. Gov., Army Air Forces. Specification 24815-A; 1944. Adapter; Gun Mount; Type C-19.

U. S. Gov., Army Air Forces. Specification 24818-A; 1945. Installation; Bomb Hoisting Equipment.

U. S. Gov., Army Air Forces. Specification 24838; 1943. Mount; Gun, Type K-5, Swivel.

U. S. Gov., Army Air Forces. Specification 24848-5; 1944. Release; Bomb Rack, Type A-4, 24 Volts, D.C.

U. S. Gov., Army Air Forces. Specification 24850; 1943. Chuting; Flexible Ammunition (Caliber .50 Machine Gun).

U. S. Gov., Army Air Forces. Specification 24857-A (1); 1944. Bracket; Gun Trunnion, Type A-1A.

U. S. Gov., Army Air Forces. Specification 24874; 1943. Latch; Ammunition Chute, Type A-1.

U. S. Gov., Army Air Forces. Specification 24875; 1943. Adapter; Ammunition Chute, Type L-1.

U. S. Gov., Army Air Forces. Specification 24876; 1943. Adapter; Ammunition Chute, Type L-2.

U. S. Gov., Army Air Forces. Specification 24884 (1); 1944. Mount; Gun, Type K-6A, Swivel.

U. S. Gov., Army Air Forces. Specification 24893; 1943. Adapter; Link Chute, Type M-1.

U. S. Gov., Army Air Forces. Specification 24896; 1943. Post; Gun Mounting, Type A-5.

U. S. Gov., Army Air Forces. Specification 24922; 1944. Mount; Gun Sight, Type C-5.

U. S. Gov., Army Air Forces. Specification 24935-1; 1944. Rack; Bomb, Type S-1, 24 Volts.

U. S. Gov., Army Air Forces. Specification 27458 (1); 1943. Tube; Power Venturi, Plastic, Type A-4, Aircraft.

U. S. Gov., Army Air Forces. Specification 28618-A; 1945. Filter; Adsorbent, Mobile Oil.

U. S. Gov., Army Air Forces. Specification 32331-A; 1943. Filter; Noise, Radio Frequency.

U. S. Gov., Army Air Forces. Specification 40267-B (3); 1941. Equipment for the Elimination of Ice on Aircraft; General Specification for.

U. S. Gov., Army Air Forces. Specification 40271-A; 1940. Filter; Air, Inflatable Shoe.

U. S. Gov., Army Air Forces. Specification 40327; 1941. Recharger; Aircraft Oxygen Cylinder.

U. S. Gov., Army Air Forces. Specification 40352; 1942. Purifier; Oxygen, Type A-3.

U. S. Gov., Army Air Forces. Specification 40396(3); 1943. Spray Equipment; Windshield Anti-Icing, Aircraft.

U. S. Gov., Army Air Forces. Specification 40435 (3); 1944. Transparent Areas; Aircraft, Equipment for Maintaining Vision Through, General Specification for.

U. S. Gov., Army Air Forces. Specification 40450 (2); 1943. Cartridge; Oxygen Purifier.

U. S. Gov., Army Air Forces. Specification 40600; 1943. Nozzle; Self-Closing, Fuel and Oil Servicing.

U. S. Gov., Army Air Forces. Specification 40665; 1943. Equipment; Aerial Delivery, Cargo Type Airplanes and Gliders, General Specification for.

U. S. Gov., Army Air Forces. Specification 40697; 1943. Set; Hydraulic System Field Testing, Type D-1, Portable, for Aircraft.

U. S. Gov., Army Air Forces. Specification 40746A-1; 1944. Installation of Hold-Down Fittings in Aircraft.

U. S. Gov., Army Air Forces. Specification 40751-A; 1945. Kit; Rain Repeller, Type AA-1, for Aircraft Windows.

U. S. Gov., Army Air Forces. Specification 40796; 1944. Packer; Aircraft Wheel Bearing Grease.

U. S. Gov., Army Air Forces. Specification 40831-2; 1945. Cradle; Engine Transportation, Type B-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-1; 1944. Anti-Icing System; General Specification for Propeller Fluid.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-3a; 1944. Accumulators; Hydraulic Pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-2; 1942. Filters; Turn and Bank Indicator, Air.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-3a-1; 1944. Filters; Hydraulic.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-9a; 1942. Filters; Air, Vacuum Operated Instruments.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-16; 1943. Insulators; Vibration.

U. S. Gov., Army-Navy Aeronautical Specification AN-J-8-1; 1945. Joints; Oxygen Swivel.

U. S. Gov., Army-Navy Aeronautical Specification AN-K-1; 1944. Kits; Airplane Mooring.

U. S. Gov., Army-Navy Aeronautical Specification AN-N-6-1; 1944. Nozzles; Aircraft Fuel and Oil Servicing.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-3-1; 1943. Plates; Location and Attachment of Identification and Modification.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-38-2; 1944. Plates; Information and Identification.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-47-2; 1944. Plugs; Dehydrator.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-50-1; 1944. Pumps; Engine Driven Air.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-7; 1942. Reservoirs; Hydraulic.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-36a; 1944. Shunts; 50 Millivolt External Ammeter.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-10; 1942. Tubes; Power Venturi.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-17-1; 1943. Towing and Mooring Gear for Seaplanes, Flying Boats, and Amphibians; Design and Installation of.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-42-2; 1944. Tools; Special Airframe and Airframe Accessories, Hand.

U. S. Gov., Civil Aeronautics Board. Civil Air Regulations Part 15—Aircraft Equipment Airworthiness, 1942. Includes provision for rating, classification of items of equipment, factors affecting certification or approval, and requirements for landing gear equipment, landing gear wheels, seaplane floats, skis, navigation appliances, position lights, landing flares, safety equipment and belts, parachutes, and control, and structural units.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-14. MRLD and MLD Stations; Cabinet Type Rack Assemblies.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-22. Cabinet Type Rack Assemblies for SRA-D Stations.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-96. Motor-Alternator Unit; Electric, for U.H.F. Range Use.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-111. MRL-ML Stations; Cabinet Type Rack Assemblies.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-301. R.F. Monitor Unit.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-352. Cross Pointer Instrument.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-433. Colors; Aviation, Lens, Filters, Etc.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40268; 1944. Shoes; Inflatable, Ice-Elimination, General Specification for.

References.—Turnbuckles, aeronautic, *see* 608.7; bolts and nuts, aeronautic, *see* 608.31, 608.32; airplane cloth, *see* 396.

724.3 AIRPLANES

U. S. Gov., Army Air Forces. Specification 1801-C; 1944. Form; Airplane Manufacturers' Model Specification.

U. S. Gov., Army Air Forces. Specification 40118A; 1940. Data for Preliminary Design and Release for Construction of Complete Airplanes.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-1a-1; 1943. Handbooks; Structural Repair, for Airplanes.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-13-1; 1943. Handbooks; Erection and Maintenance Instructions, for Airplanes.

U. S. Gov., Army-Navy Aeronautical Specification AN-H-22; 1944. Handbooks; Erection and Maintenance Instruction, for Experimental Airplanes.

U. S. Gov., Civil Aeronautics Board. Civil Air Regulations Part .04—Airplane Airworthiness, 1942. Includes definitions and requirements (with tables) for structural loading conditions, proof of structure, detail design and construction, equipment, powerplant installation, and miscellaneous.

724.4 AIRSHIPS

U. S. Gov., U. S. Army, Army Air Forces. Specification 99-2006; 1937. Envelope; Nonrigid Airship, General Specification.

U. S. Gov., U. S. Army, Army Air Forces. Specification 99-2007; 1937. Control Surface; Nonrigid, Airship, General Specification.

U. S. Gov., U. S. Army, Army Air Forces. Specification 99-2050F; 1937. Marking for Airships; Balloons, and Parts Thereof.

U. S. Gov., U. S. Army, Army Air Forces. Specification 99-2088; 1934. Paraffin Coating for Balloon and Airship Envelopes.

U. S. Gov., U. S. Army, Army Air Forces. Specification 99-2151A; 1929. Accessories; Rigging, Wooden, General Specification.

725. CYCLES, BOATS, SHIPS, AND ACCESSORIES

725.1 BICYCLES

U. S. Gov., Federal Specification KKK-B-286; 1944. Amendment 1; 1944. Bicycles. Covers four types—(I) delivery, (II) light duty, (III) military, and (IV) standard; and two classes—(A) men's and (B) women's. Gives requirements for sizes, baskets for type I bicycles, material, workmanship, measurement for size, frame joints, washers for attached members, thicknesses and diameters, lubrication, marking, finish, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 18-2C; 1942. Bicycle.

U. S. Gov., Veterans Administration. Specification VA-M-78; 1933. Bicycles; Men's.

References.—Bicycle tires, *see* 206.2.

725.2 MOTORCYCLES AND ACCESSORIES

Tire and Rim Assn., Inc. Passenger Car Handbook, 1944. Standard Contour Drop Center Motorcycle Rim. Gives diagram of contour of rim.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 91-77; 1940. Scooter; Motor, Gasoline, Type A-1.

References.—Motorcycle tires, *see* 206.2, 206.4.

725.3 BOATS, RAFTS, AND PARTS

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Motor Craft; Pleasure and Commercial. Includes gasoline, Diesel, and semi-Diesel powered boats. Covers regulations for fire protection, including location and construction of fuel tanks, fuel lines, carburetion, motor exhaust, ventilation, hull and galley arrangement, galley stoves, cabin heaters, ice machines, electrical equipment, lightning protection, lamps and lanterns, fire extinguishing apparatus, etc.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Motorboat Propeller Shaft Couplings, adopted 1929. For use in cases where it is desired to use the tapered type. Diagrams and tables of marine propeller shaft end dimensions (both ends), and propeller shaft coupling bores for nominal shaft diameters from 3/4 to 3 in.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Outboard Motorboat Transoms, adopted 1935. Diagrams and table of height, thickness, and angle of transom, distance for adjustment angle on stern bracket, and antiplate below boat for transoms for regular motors and for racing motors.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units; Parts, and Fittings. S.A.E. Standard Motorboat Controls, adopted 1920. Requirements for spark and throttle control lever locations and operation of gearshift lever for motorboats intended for one man control.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Motorboat Propeller Shaft Ends and Hubs, revised 1935. Diagrams and tables of dimensions for shaft ends and hubs without sleeves for shaft diameters from 3/4 to 8 in. in diameter, and for hubs with sleeves for shaft diameters 3 1/4 to 8 in. in diameter.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Piston Rings and Grooves, revised 1942. Adopted as a standard primarily for the types of internal combustion engines commonly used in automobiles, motorboats, etc. For pistons used in aircraft engines and engines not of the conventional automobile type, it may be necessary to deviate from the rings and grooves recommended, but such modifications should not be made by changing the piston ring width or radial thickness. Includes tables for piston ring and groove widths, and ring widths for cylinder diameters; formulas for ring grooves; tables for piston ring radial wall thickness and groove diameters, and piston ring radial wall thickness and groove diameters for thick wall compression rings; and S.A.E. Recommended Practice for ring joints and drain holes with tables for ring joint clearances, number of oil ring groove drain holes, size of oil ring drain holes, and "K" type ring and groove dimensions.

U. S. Gov., Army Air Forces. Specification 40743-A; 1945. Lifeboat; Airborne, Type A-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-2b; 1944. Rafts; One Man Parachute Type, Pneumatic Life.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40420; 1943. Rafts; Pneumatic, Type A-3.

References.—Incandescent lamps for motorboats, *see* 716.12; steel plates and structural steel for ships, *see* 604.13, 605.15; ships, *see* 725.4; tolerances on metal fits, *see* 615.82.

725.4 SHIPS

725.40 General Items

The American Assn. of Port Authorities. Port Dictionary of Technical Terms, 1940. Compiled by Committee on Standardization and Special Research.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Includes conditions of classification, definitions, general requirements for keels, stems and stern frames, rudders and steering gears, single and double bottoms, frames, web frames, side stringers, beams, stanchions and deck girders, bulkheads, deep tanks, panting arrangements, shell plating, decks, superstructures, protection of deck openings, machinery space and tunnel, bulwarks, ports, ventilators, port lights, ceiling and sparring, cementing and painting, masts, derrick posts, rigging, equipment, riveting, welding, strengthening for navigation amongst ice, and vessels intended to carry oil in bulk; rules for the construction and classification of machinery, the inspection and testing of materials, surveys, and fees; tables of scantlings; and load line markings for ocean-going and Great Lakes vessels.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Freeing Tanks of Flammable Vapors. Standards for freeing oil tanks, bunkers, and compartments of dangerous concentration of flammable explosive or toxic gases previous to entering for any purpose or making repairs on oil burning or oil tank vessels.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. General Rules and Regulations Prescribed by the Board of Supervising Inspectors—Great Lakes (1931); Rivers (1929); Bays, Sounds, and Lakes Other Than the Great Lakes (1931); Ocean and Coastwise (1942); Tank Vessels (1941); and Motorboats and Certain Vessels Propelled by Machinery Other Than by Steam, More Than 65 Feet in Length (1941).

725.41 Ship Hull Details

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Materials for Hull Construction and Equipment. Includes rules for inspection and testing, defects, identification of materials, manufacturers' certificates, marking and retests, standard test pieces, structural steel for hulls, hull castings, hull forgings, anchors, chains, and steel wire rope.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 4.21; 1938. Scuppers and Floor Drains. Gives requirements for the number needed for floors of various types and occupancies, and includes descriptions of approved types of scuppers and floor drains.

U. S. Gov., Navy Dept. Specification 42N2b; 1945. Nameplates, Instruction Plates, and Other Designating Markings for Electrical and Mechanical Equipment; Shipboard Use.

U. S. Gov., Navy Dept. Specification 66F1; 1936. Filters; Gasoline, for Ship Gasoline Systems.

U. S. Gov., U. S. Maritime Commission. Specification 42-MC-4; 1944. Ladders; Escape, Chain, for Engine and Fire Rooms. Covers three types—(I) with disc ears, (II) without disc ears, and (III) combination; two classes for each type—with steel rungs and with combination steel and wood rungs; and but one grade. Gives requirements for materials, workmanship, construction, strength, length, finish, marking, and details for each type and class; inspection, sampling, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 42-MC-5; 1944. Ladders; Pilot, Flexible Chain and Wire Rope. Covers one type, one grade, and three classes—(A) with steel ears, (B) with wooden ears, and (C) with aluminum ears. Gives requirements for materials, workmanship, construction, length, double rung steps and attachments, finish, strength, marking, and details; inspection, sampling, and methods of test; and packaging, packing, and marking for shipment.

References.—Ship inspection, *see* 725.40; rigging screws, *see* 608.7; wire rope sockets and thimbles, *see* 603.42; thimbles for manila rope, *see* 619.9; fire hose racks for ships, *see* 974.3; lifeboats, *see* 725.3; medicine chests, *see* 915.43; ship berths and supports, *see* 613.1; door locks and accessories, *see* 617.21, 617.23, 617.31, 617.32; ship bolt locks, *see* 617.61, 617.42; sash hardware for ships, *see* 617.35, 617.43, 617.5; cast iron, cast steel, cast brass, *see* 611.11, 611.41, 645.21; methods of testing and general requirements for metals, *see* 600.1; zinc coatings, *see* 600.3; ship plates and structural steel, *see* 604.13, 605.15; wire rope for ships, *see* 603.42, 647.38; tolerances on metal fits, *see* 615.82; ship hinges and hasps, *see* 617.12, 617.13; hand rail brackets, *see* 617.62; door hooks, *see* 617.63.

725.42 Ship Engineering Details

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Include requirements for keels, stems and stern frames, rudders and steering gears, single and double bottoms, frames, web frames, side stringers, beams, stanchions and deck girders, bulkheads, deep tanks, panting arrangements, shell plating, decks, superstructures, protection of deck openings, machinery space and tunnel, bulwarks, ports, ventilators, port lights, ceiling and sparring, cementing and painting, ceiling and sparring, cementing and painting, masts, derrick posts, rigging, equipment, riveting, welding, strengthening for navigation amongst ice, and vessels intended to carry oil in bulk; rules for inspection and testing of materials; and tables of scantlings.

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Propellers. Includes requirements for general construction, material, blades, studs, key, protection against corrosion, and spare gear.

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations on Shipboard, 45; 1940. Addenda, 1942. Emergency Modification and Supplement, 1943. For the equipment of merchant vessels with electrical apparatus for lighting, signaling, communication, power, and propulsion either direct current or alternating current. Fire Door Equipment; Electrically Operated, Watertight. Includes centralized control panel, motor operating units, control stations, visible and audible signal system, power supply, safety equipment, and spare parts.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Marine Fire Protection. Fire protection regulations for motor craft. Fires and extinguishers divided into three classes—(A) in ordinary combustible material (quenching and cooling), (B) in flammable liquids (blanketing, direct smothering), and (C) in electrical equipment (nonconducting). Gives details concerning properties of fire extinguishers, installation and upkeep, recommended hand extinguisher equipment, and smothering systems.

U. S. Gov., Navy Dept. Specification 18L5b; 1943. Logs; Taffrail.

U. S. Gov., Navy Dept. Specification 18T21b; 1943. Tubes; Sounding-Machine, Chemical.

U. S. Gov., Navy Dept. Specification 33C7; 1940. Connectors; Flexible, Pressure-Gage.

U. S. Gov., Navy Dept. Specification 40S3d; 1944. Shapers; Crank, Universal, Motor-Driven, 16-Inch, Shipboard Use.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for hot water piping at temperatures exceeding 200° F., oil piping at temperatures exceeding 150° F., regardless of pressure, all other piping at pressures exceeding 125 lb. p.s.i., and piping for pressures and temperatures not noted above. Gives maximum allowable fiber stresses, temperature limitations, flange standards, dimensions and service pressure ratings for flanged fittings and companion flanges, and dimensions of screwed companion and blind flanges.

References.—Ship inspection, *see* 725.40; condenser tubes and tube ferrules, *see* 645.24, 645.22; pressure and vacuum gages for ships, *see* 793.2; fire clay refractories for marine service, *see* 534.12; pipe coverings, *see* 707.4; metallic packing for condenser tubes, *see* 707.23; marine boilers and pressure vessels, *see* 703.1; boiler tubes, *see* 703.2; marine boiler plates, *see* 604.11; cast iron, cast steel, cast brass, cast bronze, *see* 611.11, 611.41, 645.21, 646.41; methods of testing and general requirements for metals, *see* 600.1; zinc coatings, *see* 600.3; marine steam engines and turbines, *see* 701.1, 701.2; oil engines, gasoline engines, for ship propulsion, *see* 704.1, 705.7; packing and gaskets for valves and pipe joints, *see* 707.1, 707.2; electric generators for propulsion and for auxiliary service, *see* 711.11, 711.12; electric motors for propulsion and for auxiliary service, *see* 711.21, 711.22; storage batteries for auxiliary light and power, *see* 712.2; controllers and starters, *see* 714.11; switchboards, *see* 714.42; circuit breakers, switches, *see* 714.51, 714.52; conduit, feeder and junction boxes, *see* 715.11, 715.12; receptacles and plugs, *see* 715.21; electric cable and wire for marine use, *see* 715.41, 715.44; searchlights, *see* 716.2; watertight electric light fixture, *see* 716.32; mechanical and electrical telegraphs on shipboard, *see* 718.39; radio transmitters, radio receivers, *see* 718.63, 718.64; radiocompass, *see* 718.66; marine sextant, *see* 916.22; tolerances for metal fits, *see* 615.82.

725.43 Ship Operation Details and Supplies

U. S. Gov., Navy Dept. Specification 19R2; 1944. Release-Devices; Hydraulic, For Freeing Life-Saving Equipment Incident To Sinking of Vessels.

U. S. Gov., Navy Dept. Specification 23F2c; 1941. Fenders; Ship, Cane, Woven.

U. S. Gov., Navy Dept. Specification 60M1; 1941. Mufflers; Exhaust, Diesel-Engine.

References.—Marine glue for seams for ship decks, *see* 505.36; hose for ships, *see* 202.0, 202.12, 202.22, 202.41, 202.42, 202.44, 202.46; flexible metallic hose, *see* 607.7; mattresses and mattress covers, *see* 315.10, 315.14; bed sheets, *see* 315.2; pillows and pillow cases, *see* 315.30, 315.31; bedspreads, spring covers, *see* 315.4, 315.6; table cloths, tray cloths, *see* 316.1, 316.4, 339.3; towels, bath mats, *see* 319.3, 339.50; marine uniforms, *see* 311.6, 368.82; table glassware and chinaware, *see* 523.9, 532.1; silverware, *see* 691.2; wire rope for ships, *see* 603.42, 647.38; oil burners for ships, *see* 703.9; electric heaters for ships, *see* 717.1.

726. STEAM, ELECTRIC, AND GASOLINE RAILWAY CARS

726.0 GENERAL ITEMS

American Transit Assn. Recommended Practice for Protective Devices for Car Equipment, E137-37; 1937. Sets forth various devices generally known and classified as follows—choke coil, lightning arrester, automatic circuit breaker, automatic line switch or breaker, and fuses. Also gives recommended practice for the location and operation of devices.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Contour of New Passenger Cars. Standard overall and detail dimensions for new equipment.

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Div., Safety Section. Safety Rules Governing Maintenance of Equipment and Stores Employees, 1942. Gives requirements for prevention of burns (fires, explosions); handling material, tools, and equipment; operation of trucks, tractors, cranes, hoists, and derricks; working on or about machinery, engines, cars, pipe lines, refrigerating or air conditioning units, and elevators; protection against train and engine hazards; and eye protection.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet S-25. Sodium Bisulphate (Niter Cake) (Na HSO_4) Bulk Shipments in Box Cars. Recommended Practice, adopted 1921. Includes description, loading restrictions, treatment of cars before loading, and treatment of cars after unloading.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet H-1, for Shippers and Consignees. Hydrofluoric Acid (HF). Recommended Practice for the Safe Handling and Discharging of Containers, 1942. Includes description of acid; recommended precautions; recommendations for containers, labels, rubber drums, lined and unlined steel drums, lead carboys, wood barrels, and tank cars for aqueous hydrofluoric acid; recommendations for unbrazed steel cylinders for anhydrous hydrofluoric acid; and facsimile of labels recommended for application to containers.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet P-30. Poisons, I.C.C. Class B—(Solids) Cleaning Out Box Cars After Unloading. Recommended Practice, adopted 1930. Includes description of class B poisons (solids); authority for shipment; necessity for and method of cleaning out box cars after unloading; personal precautions; and placarding cars.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet TC-1 (for Consignees). Cars, Tank-Steel-Unloading, When Filled With Sulphuric Acid or Mixed Nitric and Sulphuric Acids. Recommended Practice, adopted 1938, revised 1939, 1941. Includes safety rules to be observed by employee assigned to unloading; and recommendations for compressed air used for discharge of lading, placement of car for unloading, inspection and repairs of leaks, sampling of product, dome fittings, unloading, safety vent disc, defective discharge pipe, obstructed discharge pipe, frozen (congealed) sulphuric acid and oleum, damage to exterior of tank car during unloading, return of empty cars, railroad defect cards and bad order cards, internal washing, discharge line, and internal and external antidotes—treatment.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet TC-2 (for Consignees). Cars, Tank-Steel, I.C.C. Specification 103B, Rubber-Lined, Unloading, When Filled With Muriatic Acid or Other Liquids Authorized for Shipment Therein. Recommended Practice, adopted 1938. Includes recommendations for placement of cars for unloading, safety rules to be observed by employee assigned to unloading, use of compressed air, sampling of product, dome fittings, unloading, interior rubber lining, damage to exterior of tank car during unloading, removal or reversal of placards, return of empty cars, railroad defect and bad order cards, internal washing and entering of car, discharge line, service, and internal and external antidotes—treatment.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet TC-3 (for Consignees). Unloading Liquid Caustic Cars, Tank-Steel-Unloading, When Filled With Liquid Caustic Soda or Caustic Potash. Recommended Practice, 1942. Includes recommendations for placement of car for unloading, safety rules to be observed by unloaders, cold weather handling—steaming, sampling, unloading of caustic cars, preparation of empty car for return, materials and equipment, delivery lines, railroad defect cards and bad order cards, not entering empty car, service, and first aid treatment.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet TC-4 (for Consignees). Unloading Inflammable Liquids. Cars; Tank-Steel-Unloading, When Filled With Inflammable Liquids. Recommended Practice, 1942. Includes recommendations for placement of tank car for unloading safety rules to be observed by unloaders, protection of property and workmen, sampling, unloading, tank car heating system, and preparation of empty car for return movement.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet TC-5 (for Consignees). Unloading Anhydrous Hydrofluoric Acid From Tank Cars. Recommended Practice, adopted 1943. Includes description of product, general precautions, placement of tank car for unloading, safety rules to be observed by unloaders, dome fittings, valve and fittings specifications. acid storage tank, compressed air when used for discharge of acid, unloading operations, removal or reversal of placards, return of empty cars, railroad defect and bad order cards, and service.

National Board of fire Underwriters. Discharging Flammable Liquids from Tank Cars, 38; 1932. Recommended practice for unloading systems from railroad tank cars to storage tanks located within cities or towns, for liquids having a flash point below 70°F. Unloading distance from buildings, piping to storage tanks, storage tanks, operating requirements, and hazards involved.

References.—Devices for protection against lightning, *see* 715.5.

726.1 RAILROAD CARS

American Institute of Electrical Engineers. A.I.E.E. No.11, March 1943. American Standards Assn., C35.1-1943. Rotating Electrical Machinery on Railway Locomotives and Rail Cars and Trolley, Gasoline-Electric, and Oil-Electric Coaches. Includes all rotating electrical machinery forming a part of the power equipment of electrically-propelled railway cars and locomotives (including trolley, gasoline-electric, and oil-electric coaches). Covers definitions, rating, insulation, dielectric tests, insulation resistance, commutation, overspeed tests, efficiency, and characteristic curves.

American Transit Assn. Standard A.A.R., Mechanical Div., Specifications for Use by Electric Railways Following Steam Road Practice, E17-37; 1937. Contains an index for the use of those electric railways desiring to follow steam road practice in regard to journal boxes and contained parts, wheel tread and flange contours, axle specifications and designs, and brake shoes and associated parts.

American Transit Assn. Recommended Specification for the Location of End Connection on Interurban Cars Used in Car Exchange Service, E101-27; 1927. Gives drawing as to the standard location of end connections on interurban cars.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Box Car End; Design and Strength. Specifications for the design of corrugated pressed, or reinforced flat steel plate car ends, for new cars. Thickness of plate, bracing, section modulus, and alternative arrangements. Does not include refrigerator cars.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Car Design; Fundamentals of. Standard dimensions of car, such as height from rail to various car parts, distance between center sills, standardized designation of cars based on journal sizes and number of axles under the car.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Classification of Cars, Definitions and Designating Letters, Recommended Practice. Covers passenger equipment cars, and cars built to operate in passenger trains, by classes—B, C, D, E, M, P, and I. Also general service freight equipment cars, by classes—X, R, V, S, G, H, F, T, L, N, and Y. Includes subheadings for special purposes and capacity figures.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Door for Box Cars. Recommended Practice. Covers weatherproofing, metal door stops, bottom support, starters, rollers, clearance, height of lock, etc. Includes box car end doors, and seal records for cars now in use.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Lettering and Marking of Cars. Gives requirements for letters and figures, equipment, special markings, date built, journal boxes repacked, and details for trucks and various types of cars.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Sills; Wooden, Splicing of. Specification for manner of work, with detailed drawings for various types of splice.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specification for the Construction of New Passenger Equipment Cars. Recommended Practice, adopted 1939. Structural design requirements for future equipment, basic fundamentals follow railway mail service specification for cars used in trains of over 600,000 lb. light weight. Strength members all metal, trucks, buffing-center sills, bolsters, framing, sheathing, roof, unit stresses to be used for rolled mild steel, subfloor, and insulation.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Tank Cars; Specification for. For cars in use built prior to 1930, and for new cars. Classifies old cars into six classes by underframing, date of building, and special service. Gives requirements on tank, underframe, safety valves, and tests. New cars in accordance with I.C.C. requirements and A.A.R. details, and standards, classifications of designations, specifications for cars, dimensional drawings of marking, safety valves, vents, dome, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. U. S. Safety Appliances for All Classes of Cars and Locomotives. Includes the safety-appliance acts, requirements on number, dimensions, location, and manner of application of hand brakes, running boards, steps, ladders, hand holds, uncoupling levers, and safety railings, with dimensional drawings.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wooden Cars; Reinforcing of Existing. Gives requirements for the minimum strength to be observed, draft attachments of metal, equivalent area of steel, draft-gear capacity, etc.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-21; 1927. Standard Outfit Cars for Construction Forces. Gives typical layouts and dimensions of cars, equipment and hot water heating system for dining, sleeping, and tool cars.

National Board of Fire Underwriters. Electric Cars and Trolley Buses Including Houses and Yards, No. 83; 1935. Wiring of cars, buses, and locomotives up to 60 tons, protection of power circuits, motors and controls, lighting, heating, trolley lines, third rails, construction and maintenance of buildings, fire extinguishing equipment of cars and buildings, etc.

National Hardwood Lumber Assn. Standard Specifications for Grades of Hardwoods and Cypress Lumber for Freight Cars and Locomotives, 1940. (In accordance with Assn. of American Railroads Recommended Practice and conforming to American Lumber Standards.) Includes nomenclature of commercial hardwoods and cypress, use classification, inspection regulations, grading provisions, grading specifications, description of grades, and definitions of terms.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H5; 1923. American Standards Assn., B13-1924. American Logging and Sawmill Safety Code. For log railroad cars, requirements on provision of log bunks or safety chains, equipment with handholds, steps, and brakes, design features of brake wrench.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-13; 1931. Car; Unit, Hospital.

References.—Test weight cars, *see* 793.5; protective devices, lubrication, classification of materials, *see* 726.0; structural steel for cars, *see* 605.13; alloy structural steel for cars, *see* 621.31, 621.32, 621.33; iron and steel plates and sheets, *see* 604.2; 504.2; mine cars, *see* 751; car lumber, *see* 413.2; flooring for cars, *see* 411.29; siding for cars, *see* 411.1; roofing and lining for cars, *see* 411.7; tank lumber, *see* 413.1; parts and fittings for cars, *see* 726.2; wiring of cars, *see* 715.30; car lighting, car lighting equipment, *see* 716.30, 716.39; electric locomotives, *see* 721.1.

726.2 PARTS AND FITTINGS FOR RAILROAD CARS

American Transit Assn. Recommended Practice for Air Brake and Other Air Operated Equipment, E110-37; 1937. This recommendation affords a practical guide that can be followed for future installations, or modifications of existing installations where freezing difficulties are being experienced.

American Transit Assn. Recommended Specification for Trolley Poles, Wheels, Harps, and Bases, E124-37; 1937. Gives design for trolley poles, together with tables showing dimensions of the poles for each length and class of service. Drawing and a table showing contact pressure against the trolley wire with the pole at maximum and minimum heights; and also the clearance between the trolley wire and trolley pole with the latter at a minimum operating height and the wire directly over the center of the track. Also includes method for determining length of the trolley pole for either single or double truck car with the wire at various heights above the running board.

Assn. of American Railroads, Freight Container Bureau. Bulletin 31-1939. Temporary Decking for Use in Refrigerator Cars. Decking used in refrigerator cars for the shipment of fresh fruits and vegetables. Covers construction of support units, installation of decking, and bill of materials.

Assn. of American Railroads, Freight Container Bureau. Bulletin 32-1939. The Loading of Lug Boxes; Divided Load. Includes loading specifications and diagrams covering the crosswise loading of lug boxes, and illustrating and describing the use of center gates constructed with six uprights on each side.

Assn. of American Railroads, Freight Container Bureau. Bulletin 33-1940. Use of End Boards in Loads of Fresh Fruits and Vegetables Packed in Baskets.

Assn. of American Railroads, Freight Container Bureau. Bulletin 35-1940. Type "A" Center Gate for Loads of Standard Cantaloupe Crates. Diagram with explanatory notes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Air Brakes; General Arrangement and Details. Specification for rods, levers, jaws, and pins; cylinders, triple valves, and dirt collectors; retaining valves, mounting, and miscellaneous.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. House Cars, Placard Boards for Recommended Practice. Instructions for preparation of bulletin board, size and height from floor, also includes routing boards, and painting thereof.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Badge Plate for Showing Proper Dimensions for Body and Truck Brake Gear. Covers requirements marking plate giving dimensions of levers, etc., to be attached to each car; with drawings for freight cars with combined, or detached equipment, hopper cars with detached equipment, and stamped plate showing brake lever dimensions for freight cars with combined equipment.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Hand Brakes. Covers brake chain of wrought iron or steel, and braking power formulas and diagrams. Superseded for cars built after Jan. 1, 1937, by geared hand brakes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Hatch Plugs for Refrigerator Cars. Gives detailed dimensions and materials for the design of hatch.

Assn. of American Railraods, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Ice Tanks, Refrigerator Cars. Recommended Practice. Minimum capacity of ice tanks for fresh meat cars 5,000 lb.; for fruit and dairy cars 3,000 lb. minimum, or 6,000 lb. per car.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Inspection and Maintenance of Passenger Train Car Hand Brakes. Requirements for servicing brakes, contact, unison, gear mesh, ratchet pawl, lost motion, slack, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Retaining Valve for Passenger Service. Detailed drawing for various cylinder sizes and orifice modifications.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Side Frame Brake Hanger Bracket Gage. Dimensional Drawings for "go" and "no-go" gages.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and

Recommended Practice, 1942. Single Car Testing Device for Testing Air Brake Equipment. Layout drawings for two arrangements of testing devices.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specifications for Hand Brakes on New, Non-Articulated Passenger Train Cars. Requirements for safety, harmony with power brakes, slack, clearance, angle of contact, arrangement of ratchet, pawl, release, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specifications for Freight Brakes. For power brakes and appliances for operating system. Requirements for charging, service application, emergency application, release operation; and installation and maintenance.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Steam and Air Connections for Passenger Cars. Standard, revised 1931. Specifies size of pipe and valve opening, diagrams showing location of valves, size and length of hose, steam hose coupler head, nipple and clamp. Includes requirements as to design, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Triple Valve Wear Limit Gages. Callipers for checking diameter of various parts of air brake system for wear limit. Sizes are given.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Minimum Permissible Engagement of Locking Lugs on Angle and Cut-Out Cocks. Shows drawings of valves indicating minimum allowable movement of lug.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Specifications for Geared Hand Brakes. Covers requirements for the operation, design, and installation of vertical wheel brake, horizontal wheel brake, and lever brake.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Stake Pockets; Temporary. Deviations from standard for temporary use, with drawing illustrating application to car.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Stake Pockets; Permament. For railway flat cars. Gives securing to car, size of pockets, spacing, detailed drawing of pocket, and end stakes.

Chlorine Institute, Inc. Standard Dimensions of Dome Cover Plates for Class 105-A Chlorine Tank Cars, 2-B-345; 1936. Includes 31-in. and 33-in. dome cover plates, design, materials, details of studs and gaskets.

Chlorine Institute, Inc. Cover Stop on Dome-Housing New Cars, 22039-G; 1938. Details for dimensions of dome and cover of chlorine tank car.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R162-35; 1935. Packaging of Air Brake (Electric Railway) Parts. This recommendation establishes a simplified schedule for packaging compressor and governor parts for air brakes for electric railway cars. Sponsored by American Transit Engineering Assn.

References.—Classification of railway materials, *see* 726.0; cast iron wheels, *see* 611.18; journal boxes, journal bearings, *see* 611.22, 692.3; brake beams, brake shoes, *see* 611.42, 611.43; couplers, axles, *see* 611.44, 611.52; steel wheels and tires, cast and wrought, *see* 611.49, 611.53; springs, gears and pinions, *see* 611.54, 611.55; center plates, coupler yokes, pedestals, truck bolsters, and side frames, center sills, and other structural steel for cars, *see* 605.13; wiring of cars, car lighting, lighting equipment, *see* 715.30, 716.30, 716.39; lamps for train lighting, *see* 716.10; railway motors, *see* 711.3; axle generator and regulator, *see* 711.12, 714.11; trolley current collectors, *see* 719.63; railway control apparatus, *see* 714.11; motor rating basis, standard voltages, methods of testing, safety codes for electrical equipment, *see* 710; train line receptacles and connectors, *see* 715.21; battery charging receptacle and plug, *see* 715.21; protective devices for electrical equipment, *see* 726.0, 715.5; safety valves for tank cars, *see* 607.6; triple valves and tests, *see* 607.6; air brake and signal hose, *see* 202.11; steam hose, tender tank hose, *see* 202.44, 202.45; flexible metallic hose, *see* 607.7: parts and fittings for electric locomotives, *see* 721.1; draft gear followers, *see* 611.59; car stock lumber, *see* 413.2; *see* reference under 721.1.

727. CARRIAGES, BUGGIES, COACHES, BABY CARRIAGES AND CARTS

U. S. Gov., U. S. Army, Corps of Engineers. Specification 18-16; 1930. Cart; Concrete, 6 Cubic Feet Capacity.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 18-3A; 1942. Cart; Hand.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-260; 1924. Wire Cart; Type K-1 (Formerly Type N).

U. S. Gov., Veterans Administration. Specification VA-M-276; 1937. Tray Carts; 16 Tray.

729. MISCELLANEOUS VEHICLES AND VEHICLE PARTS

729.0 GENERAL ITEMS

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-0-1A; 1939. Automotive Vehicles and Trailers, Spare and Replacement Parts and Accessories; General Requirements for.

729.1 WHEELBARROWS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R105-32; 1932. Wheelbarrows. This recommendation establishes a schedule of stock sizes and types of wheelbarrows of various types and capacities.

U. S. Gov., Federal Specification KKK-W-291; 1934. Amendment 4; 1944. Wheelbarrows. Covers seven types, including general utility (steel tray), contractors (dirt, concrete, and pan-style all with steel tray), garden (wood bed), and canal (wood tray). Gives requirements for marking, interchangeability, design details, wood, steel trays, margin or lap, reinforcement of metal-tray edges, struck capacity, tray measurement and dimensions, bolts, wheel brackets, finish and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

729.2 TRAILERS

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E Recommended Practice for Passenger Car Trailer Couplings, adopted 1938. Includes definition, coupling nomenclature, and recommendations for location, sizes, ratings, and platform.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Passenger Car Trailer Data Plate, adopted 1938. Recommendations for location of data plate and data to be given thereon.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Standard Fifth Wheel Kingpin for Commercial Trailers and Semi-Trailers, adopted 1940. Diagram giving shape, size, dimensions, tolerances.

U. S. Gov., Army Air Forces. Specification 30127-A (1); 1941. Trailer; Semi (Two Wheel) (2DT), Type F-2, for Fuel Servicing Truck.

U. S. Gov., Army Air Forces. Specification 30135 (2); 1941. Trailers; Semi (Two Wheel) (2DT), for Tactical Organization Field Use.

U. S. Gov., Army Air Forces. Specification 30137-A (2); 1943. Trailer; Semi, Instrument Shop (Armament Accessories, Portable).

U. S. Gov., Army Air forces. Specification 30144 (6); 1945. Trailer; Semi (Two-Wheel) (2DT), for Type F-2A Fuel Servicing Truck.

U. S. Gov., Army Air Forces. Specification 30149 (4); 1944. Trailers; Semi (Four-Wheel) (4DT), for Type F-1A Fuel Servicing Truck.

U. S. Gov,, Army Air Forces. Specification 30168-1; 1944. Trailer; Oxygen Servicing, Type E-2.

U. S. Gov., Army Air Forces. Specification 40664; 1944. Dolly; Airplane Wheel, Type E-1.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; Barrel and Pump.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; 8-Ton, Tilting-Bed.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer: Fire-Camp Kitchen.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; 5-Ton, Tilting-Bed.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; Heavy-Duty Plow and Tractor.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; Horse and Plow Outfit.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; 1-Horse.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; 1- and 2-Horse.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; Pressure Water Tank.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; Semi, 8-Ton Capacity, Stock.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; 10-Man, Fire Tool Outfit.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; 25-Man Fire-Tool Outfit.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; Water Barrel

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; Water Barrel and Back Pack Outfit.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trailer; Water Tank.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.78. Trailers or Semi-Trailers; Low Platform Type, 10-, 15-, and 20-Ton Capacities.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-63A; 1941. Trailer; Semi, for Type C-2 Wrecking Truck, 12 1/2-Ton, 4W, 4DT.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-64; 1938. Dolly; Trailer, Converter, Type C-2 Wrecking Truck.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-69B; 1941. Trailer; Semi, 4-Wheel, 4DT. Type F-1, for Fuel-Servicing Truck.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-70; 1938. Dolly; Trailer, Converter, Type F-1, Fuel-Servicing Truck.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-79; 1941. Dolly; Trailer Converter, for Type F-2, Fuel-Servicing.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-82A; 1943. Trailer; Fuel-Servicing, Type A-2A, 220-Gallon Capacity, 3-Wheel.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-83; 1944. Trailer; 2-Wheel (2DT), Fuel-Servicing, Type A-1, 600-Gallon Capacity.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-85; 1944. Trailer; Oxygen Servicing, Type E-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-86; 1944. Trailer; Airdrome Utility, Type F-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-87; 1944. Trailers; Fuel Servicing, Type A-3

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-90; 1944. Trailer; Semi, Two Wheel, 2DT. for Type A-3A Aircraft Field Repair Shop Truck.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-91; 1944. Dolly; Trailer Converter, for Type A-3A Aircraft Field Repair Shop Truck.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-489; 1939. Trailer; Type K-19-( ), Communication Type.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1128; 1942. Trailer; Type K-29-( ), for Radio-Range Transmitter.

729.3 TRUCKS

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Hand Trucks. For 850-lb. sausage meat truck, tank-carrying truck, general purpose truck, hide truck, and steel ham and bacon truck; dimensions, materials for body, handles, wheels, and axles.

Assn. of Lift Truck and Portable Elevator Manufacturers. Specifications for Lift Trucks. For standard capacities of 2,500 to 6,000 lb., but includes 1,000- to 15,000-lb. machines, single- and multi-stroke lift types; height of lowered lifting frame, width of lifting frame, height of lift, handle area of lift, wheels, bearings, trailer attachments, brakes, backstop, etc.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.73. Trucks; Dish.

U. S. Gov., Federal Specification FF-C-86; 1938. Casters; Truck. Covers two types—(I) rigid (nonswiveling), and (II) swivel; and two classes—(A) plain-bearing axle, and (B) antifriction-bearing axle; in three materials—plain-tread metal wheel, rubber-tired metal wheel, and moulded-composition wheel. Covers material and workmanship; general requirements; detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 69T1; 1936. Trucks; Deck.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Panels; Metal Faced for Truck Construction.

U. S. Gov., Treasury Dept., Procurement Div., 482a; 1942. Trucks; Hand, Box. Shall be of steel construction. Gives requirements for truck capacity, non-tilt style, tilt style, wheels, bearings, locking devices, corrosion protection, hardwood, welding, finish, box, and cover; methods of inspection, sampling, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 484a; 1942. Trucks; Hand, Dolly. Covers hardwood frame type or all-steel frame type, and shall be 15 by 21 in. size, or 18 by 24 in. size. Gives requirements for truck capacity, full swiveling trucks, tilt trucks, wheels, bearings, locking devices, corrosion protection, hardwood, welding, finish, and steel frame construction; methods of inspection, sampling, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 594; 1942. Trucks; Hand. Platform. Covers type I, push type; and type II, wagon type; and three classes—heavy duty, medium duty, and light duty. Gives requirements for truck capacity, rated load capacity of casters, bearings, wheels, wheel mountings, swiveling-end trucks, center balancing trucks, lubrication fillings, locking devices, wooden stakes, hardwood, finish, and details for each type; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., Veterans Administration. Specification VA-G-18b; 1939. Food Conveyors for Outdoor Use.

U. S. Gov., Veterans Administration. Specification VA-M-168; 1936. Elevating or Lift Truck.

U. S. Gov., Veterans Administration. Specification VA-M-188; 1936. Elevating or Lift Truck.

U. S. Gov., Veterans Administration. Specification VA-M-222b; 1939. Elevator or Lift Truck.

U. S. Gov., Veterans Administration. Specification VA-M-270a; 1941. Small Book Truck; Two Shelf.

U. S. Gov., Veterans Administration. Specification VA-M-271a; 1941. Book Truck; Wood.

U. S. Gov., Veterans Administration. Specification VA-M-274b; 1939. Food Trucks; 6 Wheel Type, 72 In. and 80 In. Long.

U. S. Gov., Veterans Administration. Specification VA-MM-142b; 1939. Dish Trucks; Two Tier.

U. S. Gov., Veterans Administration. Specification VA-MM-143c; 1939. Dish Trucks; Three Tier.

U. S. Gov., Veterans Administration. Specification VA-MM-144; 1935. Serving Trucks; Two Tier.

U. S. Gov., Veterans Administration. Specification VA-MM-145d; 1940. Six Shelf Serving Truck; 12 Tray Type.

U. S. Gov., Veterans Administration. Specification VA-MM-146c; 1940. Six Shelf Serving Truck; 18 Tray Type.

U. S. Gov., Veterans Administration. Specification VA-MM-147c; 1940. Seven Shelf Serving Truck; 28 Tray Type.

U. S. Gov., Veterans Administration. Specification VA-MM-172c; 1939. Truck; Barrel or Drum, Tilter Type.

U. S. Gov., Veterans Administration. Specification VA-MM-272b; 1941. Book Truck.

U. S. Gov., Veterans Administration. Specification VA-MM-302a; 1939. Food Conveyors for Inside Use and Outside Use.

References.—Automobile motor trucks, *see* 722.1; electric trucks, *see* 721.2; steel sheets, *see* 604.22, 604.23, 604.25; axles and steel forgings, *see* 611.52, 611.51; cast iron, malleable cast iron, cast steel, *see* 611.11, 611.21, 611.41; sizes of wheels and tires for industrial (inside of plant) trucks, *see* 206.5.

729.4 WAGONS, WAGON PARTS, AND MATERIALS

References.—Lumber stock for wagons, *see* 413.54; singletrees, *see* 429.6.

729.5 TRACTORS AND TRACTOR PARTS

American Society of Agricultural Engineers. Power Take-Off and Drawbar Hitch Locations for Agricultural Tractors and Machines, 1941. Covers requirements for spline for tractor power take-off shaft; locations of hitch point on tractor drawbar, tractor power take-off shaft; and diagrammatic dimensional drawings of spline shafts, spline hubs, drawbar connections, and master power take-off shield.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E.-A.S.A.E. (American Society of Agricultural Engineers) Standard Tractor Drawbars and Power Take-Off, revised 1944. Gives drawings of tractor drawbars, drawings of tractor power take-off, table giving dimensions of spline shaft and hub dimensions, table giving dimensions of general shaft and hub dimensions, and drawings of power take-off master.

Society of Automotive Engineers. 1944 Handbook, Section 6—Tests, Ratings, and Codes. S.A.E.-A.S.A.E. (American Society of Agricultural Engineers) Standard Tractor Testing Code, adopted 1937. Belt and drawbar tests.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-353. Alaska Use, Tractors; Crawler Type and Various Graders.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 9. Tractors; Crawler Type, Diesel Powered, Drawbar Pull, 15 Capacities.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-66-A; 1941. Tractor; Heavy-Duty, 200 Cubic Inches Minimum Displacement, Gasoline Engine.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-72; 1939. Tractor; Light-Duty, 200 Cubic Inches Minimum Displacement, Gasoline Engine.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-12-7; 1938. Tractor; Light, M2.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-13-4; 1936. Tractor; Medium, M1.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-14-2A; 1940. Tractor; Heavy, M1, Diesel.

U. S. Gov., Veterans Administration. Specification VA-M-57b; 1935. Four Wheel General Purpose Farm Tractor.

U. S. Gov., Veterans' Administration. Specification VA-M-83d; 1938. Industrial Type Tractor Equipped With Pneumatic Tires.

U. S. Gov., Veterans Administration. Specification VA-M-84a; 1935. Farm Type Tractor.

U. S. Gov., Veterans Administration. Specification VA-MC-63a; 1939. Farm Type Tractor; Light.

U. S. Gov., Veterans Administration. Specification VA-MC-64f; 1942. Farm Type Tractor; Heavy.

U. S. Gov., Veterans Administration. Specification VA-MC-73e; 1941. Farm Type Tractor; Medium.

References.—Canvas and rubber driving belts, *see* 314.1, 207.3; shafts and forgings, *see* 611.52, 611.51; automobile and truck accessories and parts, *see* 722.3.

729.6 SLEDS AND SLEIGHS

Assn. of Lift Truck and Portable Elevator Manufacturers. Specifications for Skid Platforms. Includes capacities, underclearance (for shipping use Simplified Practice Recommendation of U. S. Dept. of Commerce, R95-30), width, length, thickness of top boards, angles and legs, four-way entry, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R95-30; 1930. Skid Platforms. Establishes clearance and over-all dimensions of skid platforms.

729.7 TANKS, MILITARY

U. S. Gov., U. S. Army, Ordnance Dept. Specification 60-22-5; 1942. Tank; Medium, M4.

730-739 AGRICULTURAL MACHINERY AND IMPLEMENTS

730. GENERAL ITEMS

U. S. Gov., Dept. of Agriculture. Miscellaneous Publication No.481; 1942. Watch Your Step—Farm Safety for National Defense. Covers around the farm including machinery, tractors, saws, tools, insect control, livestock, wells, cisterns, pits, testing water analysis, cuts, bruises, and infections; in and about the home including occupational hazards, ladders, railings, stairways, floors, doors, windows, roofs, burns and scalds, asphyxiation, gas burning appliances, poisoning, falls and broken bones, poisonings, gunshot wounds, and rural electrification; some pointers for electrical safety; farm fire prevention including common causes, faulty flues and heaters, combustible roofs, lightning, spontaneous combustion, matches and smoking, electricity, gasoline and kerosene, fire protection, water supplies for fire fighting, and private fire pump; and motor vehicle accidents including first responsibilities, driving after dark, special rules of the road, speed, and protecting the driver.

731. MILK, CREAM, AND CHEESE MACHINERY

Evaporated Milk Assn. Dairy Equipment, 1940. Includes strainers, containers, etc.; quality of construction, cleaning, storage, and handling.

International Assn. of Milk Sanitarians jointly with International Assn. of Milk Dealers and Dairy Industries Supply Assn. Three Associations' Standards. The committees from the three associations have accepted standards for—(1) a recessless sanitary union for sanitary milk pipe lines, (2) threaded fittings including bends for use with this union, and (3) improved indicating and recording thermometer connections for tanks, vats, and for pipe lines. Gives drawings of the sanitary union and drawings with tables showing dimensions for various threaded fittings including bends and thermometer connections.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.86. Pasteurizers.

References.—Cream and butterfat test scales, *see* 793.5.

732. PLANTERS, PLOWS, CULTIVATORS, HOES, RAKES, AND MOWERS

American Society of Agricultural Engineers. Power Take-Off and Drawbar Hitch Locations, for Agricultural Tractors and Machines, 1941. Covers requirements for spline for tractor power take-off shaft; locations of hitch point on tractor drawbar, tractor power take-off shaft; and diagrammatic dimensional drawings of spline shafts, spline hubs, drawbar connections, and master power take-off shield.

American Society of Agricultural Engineers. Standard Disk Blades for Disk Plows, Harrows, Drills, Listers, and Cultivators, 1931. Includes requirements for standard gages, nomenclature, polishing, bevel, concavity, sizes, tolerances, and center holes for various disks.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Plow; Horse-Drawn, Reversible Side-Hill.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Plow; Lightweight, Crawler Tractor Mounted.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Plow; Tractor-Drawn, Rolling-Disk Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Plow; Tractor-Drawn, Walking Type.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.32. Snow Plow; One Way Speed Blade, for 5-Ton Truck.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.34. Snow Plows; "V" or Reversible for 13,000 to 14,500 G.V.W. Trucks.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.35. Snow Plows; "V", One Way, for 16,000 G.V.W. Trucks.

U. S. Gov., Federal Specification 00-M-681; 1937. Amendment 2; 1944. Mowers; Lawn, Power. Covers four types—(I) rotating-reel, (II) rotary flat-knife, (III) sickle-bar, and (IV) combination. Gives requirements for classes, grades, sizes, material and workmanship, condition, construction, service requirements, balance, engine, clutches, controls, handle frame, lubrication, sulky, finish, tools, and details for each type, class, grade, and size; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-32; 1929. Plow; Road, 2-Horse, With Extra Share.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-33; 1929. Plow; Road, 6-Horse, With Reversible Point.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1671; 1944. Plow LC-61 (Cable), including Cable Recovery Device MC-548.

U. S. Gov., Veterans Administration. Specification VA-M-68c; 1937. Power Driven Mower; Twin Cylinder.

U. S. Gov., Veterans Administration. Specification VA-M-70h; 1937. Power Driven Mower; Roller Type.

U. S. Gov., Veterans Administration. Specification VA-M-97a; 1936. Non-Reversible Snow Plow; 2- to 3-Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-M-124; 1936. "V" Type Snow Plow; Tractor Mounting.

U. S. Gov., Veterans Administration. Specification VA-M-150b; 1936. Reversible Snow Plow; 2-Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-M-151a; 1938. Reversible Snow Plow; 3-Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-M-152; 1935. Reversible Snow Plow; 3- to 5-Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-M-162a; 1938. Reversible Snow Plow; Tractor Mounted.

U. S. Gov., Veterans Administration. Specification VA-M-192; 1936. Power-Driven Sickle Bar Mower.

U. S. Gov., Veterans Administration. Specification VA-M-218; 1936. "V" Type Snow Plow; 3-5 Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-M-219; 1936. "V" Type Snow Plow; 2-3 Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-M-279; 1937. One Way Snow Plow; 3-5 Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-M-291; 1938. Power Driven Mower.

U. S. Gov., Veterans Administration. Specification VA-M-292; 1938. Power Driven Mower With Low Cutting Bar.

U. S. Gov., Veterans Administration. Specification VA-M-293; 1938. Power Driven Mower; Sickle-Bar Type.

U. S. Gov., Veterans Administration. Specification VA-M-295; 1938. "V" Type Snow Plow; Four Wheel Drive.

U. S. Gov., Veterans Administration. Specification VA-M-296; 1938. One Way Snow Plow; 1 1/2-Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-M-297; 1936. "V" Type Snow Plow; Snow Truck.

U. S. Gov., Veterans Administration. Specification VA-MC-69f; 1941. Power Driven Mower; Wheel Type.

U. S. Gov., Veterans Administration. Specification VA-MC-71e; 1941. Three- or Five-Unit Gang Mowers.

U. S. Gov., Veterans Administration. Specification VA-MC-74j; 1941. Power-Driven Mower With Side Units and Riding Sulky.

U. S. Gov., Veterans Administration. Specification VA-MC-77e; 1939. Reversible Snow Plow; 1 1/2-Ton Truck.

U. S. Gov., Veterans Administration. Specification VA-MC-193a; 1939. Power Unit Gang Mower.

U. S. Gov., Veterans Administration. Specification VA-MC-299; 1939. Power Driven Sickle Bar Mower.

U. S. Gov., Veterans Administration. Specification VA-MC-M-2; 1941. All Types of Power Mowers.

733. FERTILIZER DISTRIBUTORS AND SPRAYING MACHINES

U. S. Gov., Navy Dept. Specification 41S40c; 1944. Sprayers; Insecticide, Electric.

U. S. Gov., Treasury Dept., Procurement Div., 442A 1942. Machines; Spraying, Liquid-Insecticide, Electric, Hand and Truck. Shall be of the motor-operated compressor type, for use with oil-base insecticide; two sizes—one quart, and two gallons. Gives requirements for components, design, nozzles, fluid consumption spray, air compressor, hand grip, insecticide cup, motor, spray gun, pressure gage, hose, and truck; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 461A; 1942. Sprayers; Hand, Liquid-Insecticide. Covers two types—(I) continuous-acting, and (II) single-acting. Gives requirements for construction, spray, liquid container, pump, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-M-182a; 1938. 200-Gallon Power Sprayer.

U. S. Gov., Veterans Administration. Specification VA-M-183; 1936. 300-Gallon Power Sprayer.

U. S. Gov., Veterans Administration. Specification VA-M-185; 1936. 150- Gallon Power Sprayer.

U. S. Gov., Veterans Administration. Specification VA-M-288; 1938. Suction Feed Spray Gun and Engine Cleaner.

U. S. Gov., Veterans Administration. Specification VA-MC-184c; 1940. 300-Gallon Tractor Trailer Sprayer.

U. S. Gov., Veterans Administration. Specification VA-MC-300a; 1939. 50-Gallon Power Sprayer.

References.—Power take off for tractors and agricultural machinery, *see* 729.5.

734. HARVESTING MACHINERY, THRESHERS, AND POTATO DIGGERS

References.—Power take off for tractors and agricultural machinery, *see* 729.5.

735. ENSILAGE CUTTERS AND FEED GRINDERS

References.—Power take off for tractors and agricultural machinery, *see* 729.5.

736. TRACTORS

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Machine; Brush-Buster.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Machine; Snag-Boring.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Machine; Snag-Felling.

References.—Tractors, *see* 729.5.

740-749 CONSTRUCTION, CONVEYING, AND HOISTING MACHINERY

740. GENERAL ITEMS

741. EXCAVATING AND DREDGING MACHINERY

References.—Mining machinery and mining equipment, *see* 751.

741.1 PILE DRIVERS

American Public Works Assn. Sewers, J1-38; 1938. Includes equipment for driving piles; gravity hammers for timber piles weighing not less than 2,000 and preferably not less than 3,000 lb., regulated fall not over 20 ft.; steam hammers either single or double action for use in driving timber and concrete piles to develop energy of 3,500 ft.-lb. per cubic yard of concrete in pile, construction of hammer leads, permissible use of followers in water; water jets, number of jets, volume and pressure of water, allowable variations in driving, and methods for determining load bearing values.

741.2 BORING MACHINES

U. S. Gov., Federal Specification GGG-D-326; 1942. Diggers; Post-Hole. Covers one type and grade. Gives requirements for material, workmanship, design, and dimensions; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Boring Bars, for Boring Motor Blocks.

References.—Diamond core drill fittings, *see* 741.3.

741.3 DRILLING MACHINES

Compressed Air Institute. Trade Standard, 1938. This standard includes requirements for pneumatic hoists, either cylinder hoists or air-driven multiple-piston motor-connected through gearing to a drum on which the cable is wound. Includes table giving air pressure requirements for lifting loads.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 117. Well-Drilling Outfit; Hand Power.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Well-Jetting Equipment.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS17-42; 1942. Diamond Core Drill Fittings. This standard covers four sizes of fittings, dimensions of rod couplings and casing couplings, dimensions of threads of rod couplings, drill rods, core barrel bits, casings, casing couplings, and casing bits. Sponsored by the Diamond Core Drill Manufacturers Assn.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 17. Rock Drills.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 79. Portable Gasoline Hammer and Driller.

U. S. Gov., Navy Dept. Specification 41P22a; 1924. Posts; Drilling.

References.—Oil well machinery, *see* 754.

741.4 POWER SHOVELS

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-324-1-S. Shovel; L.H.R.P. No. 2.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-324-2-S. Shovel; L.H.R.P. No. 0.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Trencher; Fire Line.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS90E-41; 1941. Crawler Mounted, Revolving Power Shovels, Lifting Cranes, Dragline and Clamshell Excavators (Export Classifications). This standard provides nomenclature, definitions, and requirements for crawler mounted, revolving power shovels, lifting cranes, and dragline and clamshell excavators. It covers shovel dipper capacities ranging from 3/8 to 2 1/2 cu. yd., and crane sizes from 2 1/2 to 50 tons. It sets up uniform methods of taking dimensions and determining working ranges, power, line speeds, line pulls, crane sizes, and lifting capacities which are to be furnished for comparison of models offered by manufacturers for export from the U. S. A. It also covers a uniform method of labeling or certifying compliance with the standard. Also printed in Spanish.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 10. Power Shovels, Draglines, Cranes or Clamshells; 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, and 2 Cubic Yard Capacities.

U. S. Gov., U. S. Army, Corps of Engineers, 44-54A; 1945. Shovel; Crawler Mounted, Gasoline Engine Driven, 1/2 and 3/4 Cubic Yard.

741.5 DREDGING MACHINERY

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 84. Dredging Machines.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Dredge Dipper, 4 Lips, 1943. For 13 1/2-yd. reinforced dipper.

References.—Dredging sleeves, *see* 209.1.

742. CONCRETE MIXERS

Associated General Contractors of America. Manual, 1941. Concrete Mixer Standards. Includes standard methods of rating capacity, design and fabrication of machine, water measuring tanks and connections, power charging skip; for five sizes of paving mixers, rated capacities, design and fabrication, water measuring devices and supply connections, traction and traction speeds, method of measurement for reach of paver boom and bucket attachments, and for batch box derrick, standard tools and accessories, engine horsepower ratings, etc.

National Ready Mixed Concrete Assn. Standards for Operation of Truck Mixers and Agitators, 1941. Covers two types of truck mixers and agitators—(A) a closed or water-tight revolving drum suitably mounted and fitted with adequate blades attached to the drum; (B) an open-top water-tight trough-like container suitably mounted and fitted with adequate blades, revolving about an axis parallel to the axis of the trough.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 18. Concrete Mixers.

U. S. Gov., Navy Dept. Specification 66M9; 1937. Mixers; Concrete, Construction.

U. S. Gov., Panama Canal, Purchasing Dept. Mixers; Concrete, 1943. Heavy duty, portable, capacity 14 cu. ft.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-38B; 1943. Mixer; Concrete, Portable.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-45; 1943. Mixer; Rotary Tiller, Soil Stabilization Gasoline Engine Driven, Self-Powered, Trailer Mounted.

U. S. Gov., Veterans Administration. Specification VA-MC-96e; 1940. 3 1/2-Cubic Foot Concrete Mixer.

U. S. Gov., Veterans Administration. Specification VA-MC-200b; 1940. 7-Cubic Foot Concrete Mixer.

References.—Donkey engines, *see* 703.1; automobile truck engines, tractors, *see* 722.31, 729.5.

743. ROAD-MAKING EQUIPMENT

American Road Builders' Assn. Steel Side Forms for Concrete Pavements. Bulletin 15; 1931. Recommendations on standard widths of base for various heights of form, permissible vertical tolerance on the top, and lateral tolerance on the upstanding leg.

Tire and Rim Assn., Inc. 1942 Year Book. Mud and Snow and Earth Moving Tires and Rims. Gives table of nominal and maximum cross-section of tires and rims, and original equipment recommendations covering various sizes of rims.

Tire and Rim Assn., Inc. 1942 Year Book. Pneumatic Industrial Tires, Cross-Sectional Limits, and Valves. Gives table covering various sizes and types of rims and valves.

Tire and Rim Assn., Inc. 1942 Year Book. Road Building and Maintenance Balloon Tires, Rims, and Valves. Gives table showing nominal and maximum cross-sections of tire sizes, and original equipment recommendations covering various sizes and types of rims, and metal and rubber valves.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS90E-41; 1941. Crawler Mounted, Revolving Power Shovels, Lifting Cranes, Dragline and Clamshell Excavators (Export Classifications). This standard provides nomenclature, definitions, and requirements for crawler mounted, revolving power shovels, lifting cranes, and dragline and clamshell excavators. It covers shovel dipper capacities ranging from 3/8 to 2 1/2 cu. yd., and crane sizes from 2 1/2 to 50 tons. It sets up uniform methods of taking dimensions and determining working ranges, power, line speeds, line pulls, crane sizes, and lifting capacities which are to be furnished for comparison of models offered by manufacturers for export from the U. S. A. It also covers a uniform method of labeling or certifying compliance with the standard. Also printed in Spanish.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 7. Leaning Wheel Graders. (A) hand, 6,000 lb. capacity; (B) hand, 8,000 lb.; (C) hand, 10,500 lb.; (D) power, 8,500 lb.; (E) 11,500 lb.; and (F) 12,500 lb. capacities.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 15. Paving Breakers.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 40. Bulldozers.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 70. Road Rippers; Cable-Controlled, Heavy Duty.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 88. Motor Graders; General Specifications, including Optional Equipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-34; 1930. Grader; Road, 8-Foot Blade, Complete.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-35; 1930. Graders; Road, 12-Foot Blade, Complete.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-36; 1929. Scraper; Drag, 5-Cubic Feet Capacity.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-40; 1930. Roller; Road, Gasoline, 10-Ton.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-43; 1938. Hammer; Gasoline, Portable.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-46; 1943. Cultivator, Chisel Tooth, 12-Inch Spacing, 8 Foot Width.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-48; 1943. Spreader; Aggregate, Tower Type, Traction Powered, 8 Foot Width.

References.—Concrete mixers, tractors, plows, *see* 742, 729.5, 732; weighing equipment for concrete aggregates, *see* 793.5.

744. CRANES, HOISTS, AND JACKS

744.1 CRANES

American Society of Mechanical Engineers, Joint sponsor with Bureau of Yards and Docks, U. S. Navy Dept. American Standards Assn., B30.2-1943. Safety Code for Cranes, Derricks, and Hoists. Covers scope, interpretations and exceptions, new and old installations, references to other codes, mandatory and advisory rules, definitions, construction, installation, inspection, testing, maintenence, and operation.

Assn. of Iron and Steel Engineers. Electric Overhead Traveling Cranes for Steel Mill Service, 1942. These specifications cover heavy duty, mill type, overhead traveling cranes. All cranes for special service such as charging, pit, stripper, ladle, gantry cranes, or ore bridges, etc., shall so far as possible comply with these specifications. Covers general requirements, structural design, mechanical details, electrical details, appendix, and tables.

U. S. Gov., Army Air Forces. Specification No. 30165; 1944. Truck; Crane, Type P-1, Full Revolving, 10-Ton.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment (comprising Part 3—for 25- to 270-volt equipment which is accessible to other than qualified electrical operators—and the grounding rules of the Fifth Edition, National Electrical Safety Code). For cranes and hoists, requirements on guarding live and moving parts, grounding noncurrent-carrying parts, control of energy supply, and control of movement.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS90E-41; 1941. Crawler Mounted, Revolving Power Shovels, Lifting Cranes, Dragline and Clamshell Excavators (Export Classifications). This standard provides nomenclature, definitions, and requirements for crawler mounted, revolving power shovels, lifting cranes, and dragline and clamshell excavators. It covers shovel dipper capacities ranging from 3/8 to 2 1/2 cu.yd., and crane sizes from 2 1/2 to 50 tons. It sets up uniform methods of taking dimensions and determining working ranges, power, line speeds, line pulls, crane sizes, and lifting capacities which are to be furnished for comparison of models offered by manufacturers for export from the U. S. A. It also covers a uniform method of labeling or certifying compliance with the standard. Also printed in Spanish.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 6Yd; 1939. Electric Bridge Cranes (75 Tons Capacity and Under).

U. S. Gov., U. S. Army, Corps of Engineers. Specification 44-24; 1928. Derrick; Guy, Wood, 5-Ton, With Gasoline Hoisting Engine.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-5A; 1932. Crane; Wrecking, Railroad, Standard Gage.

References.—Cast iron, malleable cast iron, cast steel, *see* 611.11, 611.21, 611.41; structural steel, *see* 605.1; electric motors, electric controllers, *see* 711.2, 711.3, 714.11; methods of testing motors, *see* 710, 711.20; electric wire, *see* 715.44; tolerances for metal fits, *see* 615.82.

744.2 HOISTS

American Petroleum Institute, Div. of Production. Standard 11-G, 1941. Specification on Rating of Sucker Rod and Tubing Hoisting Equipment. Covers a method of rating hoisting tools on pumping equipment based upon physical tests to the breaking point.

American Society of Mechanical Engineers, joint sponsor with Bureau of Yards and Docks, U. S. Navy Dept. American Standards Assn., B30.2-1943. Safety Code for Cranes, Derricks, and Hoists. Covers scope, interpretations and exceptions, new and old installations, references to other codes, mandatory and advisory rules, definitions, construction, installation, inspection, testing, maintenance, and operation.

Compressed Air Institute. Trade Standard, 1938. This standard includes pneumatic tools and accessories, rock drills, portable compressors, receivers, aftercoolers, filters, piping, and valves. For portable pneumatic grinders, drills, riveting hammers, hoists, sand rammers, and gives requirements as to operating speeds, sizes or types, capacities, safety precautions, hose sizes, operation, and maintenance.

Electric Hoist Manufacturers Assn. Standard Specifications for Wire Rope Electric Hoists. General requirements for material to conform with A.S.T.M. specifications, motors meeting A.I.E.E. specifications for this class of service, controllers complying with National Electrical Manufacturers Assn. standards, wiring in accordance with the National Electrical Code; for factors of safety, hoist gearing, brakes, drums, bearings, lubrication, load block, limit switch, hoisting rope or chain, and marking of capacity.

Monorail Manufacturers Assn. Specifications for Overhead Track Systems, 1938. Includes electric hoists; general requirements for factors of safety. The specifications for hoists are those of the Electric Hoist Manufacturers Assn. and have been approved by this organization.

U. S. Gov., Army Air Forces. Specification No.24797; 1943. Cable Assembly, for Type C-6 Bomb Hoist.

U. S. Gov., Army Air Forces. Specification 24834-2; 1944. Hoist; Bomb, Type C-6, 115 Volts, D. C.

U. S. Gov., Army Air Forces. Specification 40602-1; 1943. Hoist; Maintenance, Truck, Type A-6.

U. S. Gov., Army Air Forces. Specification 40698-1; 1944. Hoist; Engine, Type A-7, Portable, 4,500 Pound Capacity.

U. S. Gov., Army Air Forces. Specification 40750 (2); 1944. Hoist; Collapsible Mobile, Type B-1, 50,000 Pound Capacity.

U. S. Gov., Army Air Forces. Specification No.40881; 1944. Hoist; Turret, Type A-1, for B-17 Aircraft.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.37. Double Drum Hoists.

U. S. Gov., Navy Dept. Specification 40H7d; 1944. Hoists; Electric, Motor-Operated.

U. S. Gov., Navy Dept. Specification 40H8a; 1944. Hoists; Pneumatic, Motor, Geared.

U. S. Gov., Navy Dept. Specification 41H12g; 1943. Hoists, Chain, Hand-Operated; and Trolleys.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Hoists, 1943. Air Motor; 10 Ton, 5 Ton, and 2 Ton.

U. S. Gov., Treasury Dept., Procurement Div., No.368; 1939. Hoists and Buckets, for Earth and Stone Moving; and Passenger Transport Bodies. Hydraulically, mechanically, or combination hydraulically and mechanically operated of two classes, for heavy materials and for light weight materials. Gives requirements for hoist frame, hydraulic hoisting system, sheaves and wire rope, mounting, buckets, lubrication, and finish; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-10; 1930. Hoist; Gasoline, Single-Friction Drum, 20 Hp.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 90-11; 1930. Hoist; Gasoline, Double-Friction Drum, 20 Hp.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1643; 1943. Boom Equipment LC-60.

U. S. Gov., U. S. Maritime Commission. Specification 41-MC-4; 1941. Hoists; Chain, Fixed, Spur Gear, Ball or Roller Bearing. There shall be but one type and grade. Gives requirements for sizes, materials, workmanship, locking mechanism, hand and load chains, chain wheels, load shaft, hooks and swivels, bearings, gears, covers, methods of sampling, inspection, tests, and efficiency.

References.—Mine hoists, *see* 751; elevators, *see* 745.3; steel wire rope, *see* 603.42; cast iron, malleable iron, cast steel, *see* 611.11, 611.21, 611.41; electric motors and controllers, *see* 711.2, 7.11.3, 714.11; methods of test, protection, safety codes for motors, *see* 710, 711.20; electric wire, *see* 715.44.

744.3 JACKS

U. S. Gov., Veterans Administration. Specification VA-MC-50f; 1942. Hydraulic Automobile Lift.

References.—Screw jacks and hydraulic jacks, *see* 616.91.

745. ELEVATOR AND CONVEYORS

745.0 GENERAL ITEMS

U. S. Gov., Dept. of Commerce. Circular of the National Bureau of Standards, C441; 1942. Elevator Wire Rope Maintenance. Covers factors affecting the wear of wire rope, installation of new ropes, rope inspection, special rope maintenance items for drum machines, and saving rope by reduction of service.

U. S. Gov., Dept. of Commerce. Circular of the National Bureau of Standards, C442; 1943. Maintenance of Elevator Mechanical Safety Appliances. Covers governors, releasing carrier, undercar safeties, guide rails, buffers, anchorage, corrosion, flooding, and inspection.

U. S. Gov., Dept. of Commerce. Circular of the National Bureau of Standards, C443; 1943. Maintenance of Elevator Hoistway and Car Enclosures and Equipment. Covers hoistway enclosures and protection, causes of hoistway-door accidents, interlock inspection, maintenance of hardware, hoistway doors and gates, hoistway enclosures, car and car equipment, inspections, and signal systems.

U. S. Gov., Dept. of Commerce. Circular of the National Bureau of Standards, C444; 1943. Maintenance of Elevator Hoisting Machines and Brakes. Covers elevator hoisting machines and brakes. constituent parts of machine, outline of weekly motor inspection, outline of annual motor inspection, brake inspection, gearing, drive sheave and drum maintenance, inspection of belted machines, inspection of overhead sheaves and bearings, and inspection of motor-generator sets.

745.1 CONVEYORS

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Trolleys. Requirements on dimensions of one standard size of single wheel trolley with cast iron wheel and steel housing for carrying meats on overhead track.

Monorail Manufacturers Assn. Specifications for Overhead Track Systems, 1938. Gives general requirements, track material and design, suspension fittings, manually operated trolleys or carriers, switches, cranes and transfer bridges, track openers or lift-out links, electrical construction, collector wheels or shoes, electric hoists, wiring and control, in accordance with the requirements of the National Electrical Code.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 16Ye; 1941. Refrigerating Equipment (also includes Ice-Making Equipment). Includes requirements for meat tracks and trolleys.

745.2 DUMBWAITERS

American Society of Mechanical Engineers, joint sponsor with National Bureau of Standards and American Institute of Architects. American Standards Assn., A17.1-1937. Safety Code for Elevators, Dumbwaiters, and Escalators. Covers construction, inspection, maintenance, and operation of elevators, dumbwaiters, escalators and their hoistways excepting belt, bucket, or roller conveyors for freight, piling machines, skip hoists, wharf ramps, amusement devices, elevators of over 30,000 lb. capacity and elevators used during building construction. Requirements as to hoistway construction, guards and landings, elevator requirements as to guides, buffers, counterweights, car construction, safeties for car and hoisting machinery, cables and signal systems, rules for inspection, maintenance, and operation.

American Society of Mechanical Engineers, joint sponsor with National Bureau of Standards and American Institute of Architects. American Standards Assn., A17.3-1942. Supplement to the 1937 Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators. Includes interpretations of rules and revised rules.

745.3 ELEVATORS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Electrically-Operated Freight or Baggage Elevators. Gives requirements for car platform, cover, and frame, hatchway and shaft enclosure; hoisting machine; overhead sheaves; lifting cables; counterweights; guide posts and guides; control; operating devices; buffers; governor and safety devices; limit, and safety switches; electrical equipment; signal systems; and guarantee.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Hydraulic Elevators—Baggage or Freight. Gives requirements for the system, car platform, car cover, car frame, hatch-ways and shaft enclosure, cylinder wells, cylinders, plungers, stuffing boxes, counterweight, guide posts and guides, control, operating device, buffers, elevator doors, pumping plant, pump, tanks, air supply, pipe, fittings, insulation, electrical equipment, signal system, lubricators, cable lock, lubricants, painting, and guarantee.

American Society of Mechanical Engineers, joint sponsor with National Bureau of Standards and American Institute of Architects. American Standards Assn., A17.1-1937. Safety Code for Elevators, Dumbwaiters, and Escalators. Covers construction, inspection, maintenance, and operation of elevators, dumbwaiters, escalators and their hoistways excepting belt, bucket, or roller conveyors for freight, piling machines, skip hoists, wharf ramps, amusement devices, elevators of over 30,000 lb. capacity and elevators used during building construction. Requirements as to hoistway construction, guards and landings, elevator requirements as to guides, buffers, counterweights, car construction, safeties for car and hoisting machinery, cables and signal systems, rules for inspection, maintenance, and operation.

American Society of Mechanical Engineers, joint sponsor with National Bureau of Standards and American

Institute of Architects. American Standards Assn., A17.2-1937. American Recommended Practice for the Inspection of Elevators (Inspector's Manual). A guide for the general use of elevator inspectors. Based on requirements of American Standard Safety Code for Elevators, Dumbwaiters, and Escalators.

American Society of Mechanical Engineers, joint sponsor with National Bureau of Standards and American Institute of Architects. American Standards Assn., A17.3-1942. Supplement to the 1937 Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators. Includes interpretations of rules and revised rules.

Assn. of Lift Truck and Portable Elevator Manufacturers. Specifications for Portable Elevators. Covers standard hand and electrically operated types with capacities from 500 to 5,000 lb., lowered platform height, hinge height, overall and lifting height, width, length, base frame, platform, hoist, main frame, power-operated characteristics, and special purpose equipment.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Elevators. Permissible voltages on various parts, types, insulation, minimum sizes, protection, installation of conductors for various circuits, requirements on enclosure of live parts, grounding, clearance around controller panels, location of disconnecting switch, elevator machine, and controller.

National Elevator Manufacturing Industry, Inc. Elevator Engineering Standards. Includes engineering data sheets covering car and hatchway dimensions for freight, passenger, and hospital elevators; and standard specifications for car switch control passenger elevator, car switch variable voltage control passenger elevator, car switch control freight elevator, and continuous pressure push button control freight elevator.

National Elevator Manufacturing Industry. Elevator Engineering Standards, June, 1940. This standard gives dimensional requirements for freight elevators of 2,500 to 10,000 lb. capacity; office building, bank, hotel, etc., capacities 1,500 to 3,500 lb.; retail store elevators with capacities of 3,000 to 5,000 lb.; apartment house elevators with capacities of 1,500 to 2,500 lb.; and hospital elevators with capacities of 3,500 and 4,000 lb.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H33; 1940. American Standards Assn., C2.3-1941. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment (comprising Part 3—for 25 to 270-volt equipment which is accessible to other than qualified electrical operators—and the grounding rules of the Fifth Edition, National Electrical Safety Code). For elevators, requirements on guarding live and moving parts, grounding noncurrent-carrying parts, control of energy supply, and control of movement.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 14Yd; 1939. Electric Elevators.

References.—Industrial hoists, mine hoists, *see* 744.2, 751; steel cables, *see* 603.42; electric motors, controllers, *see* 711.2, 711.3, 714.11; methods of test, protection, safety code for motors, *see* 710, 711.20; electric wire, *see* 715.44.

745.4 ESCALATORS

American Society of Mechanical Engineers, joint sponsor with National Bureau of Standards and American Institute of Architects. American Standards Assn., A17.1-1937. Safety Code for Elevators, Dumbwaiters, and Escalators. Covers construction, inspection, maintenance, and operation of elevators, dumbwaiters, escalators and their hoistways excepting belt, bucket, or roller conveyors for freight, piling machines, skip hoists, wharf ramps, amusement devices, elevators of over 30,000 lb. capacity and elevators used during building construction. Requirements as to hoistway construction, guards and landings, elevator requirements as to guides, buffers, counter-weights, car construction, safeties for car and hoisting machinery, cables and signal systems, rules for inspection, maintenance, and operation.

American Society of Mechanical Engineers, joint sponsor with National Bureau of Standards and American Institute of Architects. American Standards Assn., A17.3-1942. Supplement to the 1937 Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators. Includes interpretations of rules and revised rules.

746. TOWING DEVICES

750-759 MINING, OIL WELL, AND PUMPING MACHINERY

750. GENERAL ITEMS

American Mining Congress. Joint sponsor with U. S. Gov., Dept. of Interior, Bureau of Mines. American Standards Assn., M2-1926. Safety Rules for Installing and Using Electrical Equipment in Coal Mines. Definitions, limitations on voltage and capacity, use of insulated platforms, grounding of frames and sheaths, guarding of circuits, installation and protection of motors and controllers, safety devices for electric hoists, construction of underground stations and switchboards, installation of lamps, requirements for portable electrical equipment, installation and protection of circuits, trolley wires, signal and telephone circuits, and shot-firing circuits.

American Mining Congress, sponsor. American Standards Assn., M6-1931. Drainage of Coal Mines. Requirements for pumps and pumping stations, specifications for electric driven plunger pumps, for centrifugal pumps, for pump accessories, construction of pumps, practice in priming piston, plunger and centrifugal pumps, semiremote control, safety precautions and attendance, natural drainage, unwatering abandoned workings, mine water and its action upon mine drainage equipment, recommendations of metals and alloys to use.

American Mining Congress. American Standards Assn., M15-1931. Safety Code for Coal Mine Transportation. Requirements on bonding of tracks, clearances along track, installation and operation of stopblocks and derails, signal systems, slope and shaft hoists, permissible types of haulage, location of trolley wires, operation of man trips, hauling explosives, inspection rules.

American Mining Congress, sponsor. American Standards Assn., M17-1930. Fire Fighting Equipment in Metal Mines. Recommendations on type and size of hose and water supply systems for surface and for underground fire fighting equipment; equipment of extinguishers, fire pails, sprinkling systems, oxygen breathing apparatus; recommendations on ventilation, handling explosives, signals, etc.

American Mining Congress, sponsor. American Standards Assn., M24-1932. Safety Rules for Installing and Using Electrical Equipment in Metal Mines.

American Institute of Mining and Metallurgical Engineers, sponsor. American Standards Assn., M 5-1932. Recommended Practice for Methods for Screen Testing of Ores (Hand Method). Covers sieves, preparation of the sample, size of sample or weight of charge, wet splits, standard hand-sieving manipulation, end point in sieving, dry sieving oversize from wet split, and appendix.

American Institute of Mining and Metallurgical Engineers, sponsor. American Standards Assn., M13-1942. Recommended Practice for Rock Dusting Coal Mines To Prevent Coal Dust Explosions. Covers definitions, mines to be rock-dusted, kind of dust to be used, size of dust to be used, parts of mine to be dusted, amount of dust to be used, sampling dust, inspection of dust barriers, and record of sampling.

American Society of Mechanical Engineers. Test Data on Steam and Electrical Rotary Drilling Equipment, 1933. Gives two reports from which it is possible to make direct and accurate comparisons of the dependability, flexibility, cost per foot, etc., between steam and electrical equipment for drilling rotary drilled oil wells.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Fire Fighting Equipment in Metal Mines. Recommended practice for fire fighting equipment, preventative measures, fire signals and fire fighting personnel in metal mines. Covers water and water supply equipment, fire extinguishers, fire pails and sprinkling systems, oxygen breathing apparatus, ventilation and ventilation equipment, explosives, electrical equipment, fire signals, fire fighting personnel, and miscellaneous measures.

U. S. Gov., Dept. of Interior, Bureau of Mines. Tentative Coal-Mine Inspection Standards, I.C.7204; 1942. A guide for Federal inspection of coal mines. Includes surface hazards—general, tipple, or cleaning plant, head frame, machinery and safety appliances in connection therewith, mine refuse disposal, surface haulage, hoisting equipment, cages and shafts, surface electric machinery, surface explosives; and underground hazards—general practice, ventilation, machinery and safety appliances in connection therewith, explosives and blasting devices, electricity underground, control of coal dust and rock-dusting, haulage, timbering, safety organization, and first-aid and mine rescue.

751. MINING AND QUARRYING MACHINERY

American Mining Congress, sponsor. American Standards Assn., M10-1928. Miscellaneous Outside Coal Handling Equipment. Hoisting signals, safety requirements for man haulage equipment, safety methods around tipple, fire protection, dimensions of shafting, bearings, pedestals and motor shafts at pulley end.

American Mining Congress, sponsor. American Standards Assn., M12-1928. Tentative Standard for Construction and Maintenance of Ladders and Stairs for Mines. Requirements on construction and protection of mine ladderways; required use and minimum dimensions of stairways and ladders.

American Mining Congress, sponsor. American Standards Assn., M18-1928. Underground Transportation in Metal Mines. Standard type of car, track gage, rail weight, grade of track, and dimensions of drift for hand tramming and motor haulage, weight of locomotive for motor haulage.

American Mining Congress, sponsor. American Standards Assn., M19-1928. Mechanical Loading Underground in Metal Mines. Mechanical shovelers; classification, working conditions, repairs, personnel; recommended requirements on design and size of scrapers, hoists, wire rope, sheaves, lights, and slides.

American Society of Mechanical Engineers, joint sponsor with Bureau of Yards and Docks, U. S. Navy Dept. American Standards Assn., B30.2-1943. Safety Code for Cranes, Derricks, and Hoists. Covers scope, interpretations and exceptions, new and old installations, references to other codes, mandatory and advisory rules, definitions, construction, installation, inspection, testing, maintenance, and operation.

National Safety Council (American Society of Safety Engineers, Engineering Section). American Standards Assn., A14-1935. Code for Construction, Care, and Use of Ladders. Definitions of terms; kind and quality of materials; specifications and construction of fixed mine shaft ladders for use in mine ladderways.

U. S. Gov., Federal Specification W-B-411; 1941. Amendment 1; 1943. Blasting-Apparatus (Machines, Blasting; Glavanometers and Rheostats for Testing Blasting Circuits and Machines). Covers one grade in three types: (I) Galvanometers for testing blasting circuits; (II) blasting machines, in four classes—(A) 10 cap capacity, (B) 30 cap capacity, (C) 50 cap capacity, and (D) 100 cap capacity; and (III) rheostats for testing blasting machines. Gives requirements for each type and class; methods of inspection and tests; and packing and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-71-48; 1937. Blasting Machine; 100 Cap, Commercial.

References.—Blowers, compressors, *see* 791.1, 791.2; track rails, frogs, switches, *see* 606.1, 606.3; pumps, *see* 755.1; electric motors, controllers for dangerous mines, *see* 711.25, 714.11; other electric motors, *see* 711.2; safety code for electric equipment in mines, *see* 710; oxygen breathing apparatus, *see* 993; safety code for mines, *see* 750; miners' lamps and gas detectors, *see* 997.6 and 716.17; safety code for wooden ladders, *see* 429.4; wire ropes, *see* 603.42; electric wire, *see* 715.44; explosion proof storage batteries and battery boxes, *see* 712.2, 712.3; trolley and track material, *see* 719.63; fire fighting equipment, *see* 970; tolerances for metal fits, *see* 615.82.

752. ORE CRUSHING AND ORE SORTING MACHINERY

753. SMELTING AND ROASTING MACHINERY

754. OIL WELL MACHINERY

American Petroleum Institute, Div. of Production. Code 3; 1928. Code of Recommended Field Practice. Cable Drilling and Fishing Tools. Includes requirements for transportation and handling; making up joints; and heating, dressing, and tempering drilling bits and under-reamer cutters.

American Petroleum Institute, Div. of Production. Code 4; 1934. Code of Recommended Field Practice. Standard Rigs and Derricks. Includes requirements for selection, size, capacity, foundations, name plate data, care of the derrick, and standard rig and equipment housing.

American Petroleum Institute, Div. of Production. Code 5-C-2; 1944. Performance Properties of Casing and Tubing. Gives minimum performance properties for casing and tubing. The values shown herein for casings are final, and are based mainly upon tests; and the values for tubing are tentative, and are calculated. Gives tables showing outside diameter, nominal weight, inside diameter, wall thickness, drift diameter, collapse resistance, internal yield pressure, and joint strength for various sizes.

American Petroleum Institute, Div. of Production. Code 7-A; 1932. Code of Recommended Practice for Hard Facing Rotary Bits.

American Petroleum Institute, Div. of Production. Standard No.3; 1941. Cable Drilling Tools (Taper Joints, Jars, Rope Socket Necks, Etc). Contains complete dimensional standards only and does not cover chemical or physical properties. Gives requirements for certification of reference master gages, workmanship and finish, marking, basic thread form, method of gaging boxes and pins, size of wrench squares, for drilling and fishing jars, for drilling bits, and for fishing tools, etc.

American Petroleum Institute, Div. of Production. Standard No.4; 1944. Specification for Standard Rigs, Derricks, and Accessory Equipment. This specification covers dimensional and strength requirements of steel and wood derricks, rig and derrick parts, derrick substructures, pumper structures, bolts, and capacity ratings for roller bearings. Covers material, workmanship and finish, steel derrick dimensions, steel derrick strength or capacity requirements, derrick substructures, standard rig parts, capacity rating of pumper structures, allowable unit stresses, specification for bolts, rating of radial bearings, rating of flat thrust bearings, nailed wood derrick dimensions, nailed wood derrick strength or capacity requirements, marking, inspection and rejection, and appendices.

American Petroleum Institute, Div. of Production. Standard 4-A; 1939. Rig Iron Standards. Includes dimensional standards on four sizes of rig iron and on five sizes of sand reels. Rig irons covered by this specification are for oil company purposes.

American Petroleum Institute, Div. of Production. Standard 5-G-3; 1940. Supplement 1; 1941. Standard on Ring Joints for Steel Flanges and Flange Unions, for Use With A.P.I. Tubular Goods. Covers dimensional standards on ring joints for flanges and flange valves, including, by reference, complete chemical and physical properties.

American Petroleum Institute, Div. of Production. Standard No.7; 1944. Transmission Standards. For equipment and machinery used for drilling and production purposes in the oil industry. Applies to shafting and bored members, keys and keyways, and chains. Covers material, workmanship and finish, marking, shafting and keys basic standards, shafting and keys detailed dimensions, chain, inspection and rejection, and appendices.

American Petroleum Institute, Div. of Production. Standard 7-B; 1944. Specification for Rotary Drilling Equipment. Gives final dimensional standards, including gages, for regular and full-hole rotary drilling tool joints, tentative standards for internal-flush rotary drilling tool joints, and standards on auxiliary equipment. Covers material, workmanship and finish, marking, rotary drilling tool joints, drill collars, grief stems, couplings and subs, bits, gaging practice, swivel gooseneck connections and rotary hose, rotary table, brake blocks, slush pumps, recommended practice on measurement, inspection and rejection, gages and appendices.

American Petroleum Institute, Div. of Production. Standard 11-A; 1944. Specifications for Oil Well Pumps. This specification covers dimensional elements of oil well pumps of the reciprocating type, including full barrel and liner barrel. Covers workmanship and finish, marking, typical pump assemblies, part elements, threads and gages, inspection and rejection, and appendices.

American Petroleum Institute, Div. of Production. Standard 11-B; 1942. Sucker Rod Specifications. Covers dimensional standards, gages and gaging practice on five sizes of sucker rods. Gives sufficient dimensional standards to insure interchangeability for five sizes of rods (nominal 5/8 in., 3/4 in., 7/8 in., 1 in., and 1 1/8 in.), these including the dimensions of the threaded pin, of the threaded box, of the coupling for use with "double pin" rods, and of the wrench squares.

American Petroleum Institute, Div. of Production. Standard 11-D; 1943. Supplement 1; 1944. Miscellaneous A.P.I. Pumping Equipment Standards. This specification provides—(a) complete interchangeability between manufacturers on polished rods, bore of stuffing boxes, pull rods and pull rod couplings, (b) standard openings in screened or slotted pipe with standard method of designation, (c) a recommended standard assembly of well-head pressure gage taps and fittings to avoid confusion and delay in the field.

American Petroleum Institute, Div. of Production. Standard 11-E; 1941. Specification for Rating of Steel Helical and Herringbone Gear Speed Reducers for Pumping Machines (including Rating Form for

Rotary Counterbalances). Gives scope, marking, limitations, design of gearing, design of housing, shafts and bearings, service and application, formulas, suggested method for computing well loads, rotary counterbalances, inspection and rejection, and appendices.

American Society of Mechanical Engineers, joint sponsor with Bureau of Yards and Docks, U. S. Navy Dept. American Standards Assn., B30.2-1943. Safety Code for Cranes, Derricks, and Hoists. Covers scope, interpretations and exceptions, new and old installations, references to other codes, mandatory and advisory rules, definitions, construction, installation, inspection, testing, maintenance, and operation.

References.—Oil field boilers, *see* 703.0, 703.1; internal combustion engines, *see* 705.3; roller or sprocket chain, *see* 766.1; leather belting, *see* 066.3; rubber belting, balata belting, *see* 207.3; cotton belting, hair belting, *see* 314.1; manila cordage, wire rope, *see* 331.16, 603.42; tanks, *see* 605.23; line pipe, drill pipe, casing and tubing, *see* 607.3, 607.4; line shafts for rotary drilling, *see* 611.52; diamond core drill fittings, *see* 741.3; induction motors, *see* 711.21; tolerances on metal fits, *see* 615.82.

755. PUMPS, POWER-DRIVEN AND HAND PUMPS

755.0 GENERAL ITEMS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Pumps and Piping Systems. Include requirements for bilge and ballast systems, boiler feed system, steam and exhaust piping, lubricating oil systems, fuel oil transfer and filling systems, fuel oil service systems, cargo oil systems, vent, sounding and overflow pipes, piping details, and fire protection.

American Society of Mechanical Engineers. Power Test Code. Reciprocating Steam-Driven Displacement Pumps, 1927. For determining the performance of the pump and engine, including reheaters, heaters, and jacket pumps, circulating pumps, condensate pumps, and vacuum pumps, which are concerned in their operation; with auxiliary sections on general considerations, pressure measurement, temperature measurement, electrical measurements, determination of quality of steam, measurement of time, speed measurements, linear measurements, and leakage measurement.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 25.23; 1940. Centrifugal Fire Pumps, Installation. Covers location, suction supply, pipe connections, suction lift, suction always under head, and gives drawings and charts.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 25.24; 1940. Centrifugal Fire Pumps, Power Supplies. Covers electric motor drive, steam turbine drive, gasoline engine drive, and gives drawings.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 25.25; 1941. Centrifugal Fire Pumps, Operation and Maintenance. Covers how to start a centrifugal pump, testing centrifugal fire pumps, diagnosing defects, speed troubles, suction troubles, and mechanical and electrical troubles.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 25.31; 1942. Underwriter Steam Fire Pumps, Operation and Maintenance. To provide plant engineers with helpful information in maintaining and operating these pumps at full efficiency. Covers description of pump, steam supply, suction supply, priming, pump operation, testing, maintenance, and locating troubles.

Hydraulic Institute, Standard. Data Section, 1941. Covers friction table for water, resistance of valves and fittings, viscosity, friction of oil and pipe lines, friction of paper stock in cast iron pipe, materials for pumping various liquids, and properties of water at various temperatures.

Hydraulic Institute, Standard. General Section, 1943. The material in the pamphlet is submitted as being the opinions and recommendations of the Hydraulic Institute as to what is considered good practice in the pump industry. Covers principles of business conduct, standard classification of pumps, pump applications, and sample contract form.

Hydraulic Institute, Standard. Test Code, 1943. Covers Hydraulic Institute test code-centrifugal pumps, hydraulic institute test code-rotary pumps, data and results of centrifugal and rotary pump tests, and laboratory and model tests.

National Board of Fire Underwriters. Centrifugal Fire Pumps, No. 20, 1939. Amendments, 1943. Standards for installation in six standard sizes of centrifugal fire pumps. Covers centrifugal fire pumps, electrical driving and control of pumps, steam turbines driving centriful fire pumps, gasoline engine driving of centrifugal fire pumps, Diesel engine driving of centrifugal fire pumps, tests for acceptance, and operating instructions for centrifugal fire pumps.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-1; (2); 1944. Pump Assemblies; Fluid Metering, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-2a-1; 1944. Pump Assembly; 2 G.P.H. Fluid Metering, Type A.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-41; 1943. Pump Assembly; 5 G.P.H. Fluid Metering, Type B.

755.1 PUMPS, POWER-DRIVEN

Associated General Contractors of America. Manual, 1941. Includes self-priming centrifugal pumps, open and closed diaphragm force, closed plunger, and road pumps; requirements for nominal rated capacities, standard sizes, for engine power and displacement, pressures, and rating plates.

Hydraulic Institute, Standard. Centrifugal Pump Section, 1942. Covers definitions of types and parts; standards of volume, head, power and efficiency guarantees; specific speed, suction lift, suction head; Hydraulic Institute upper limits of specific speeds for single stage pumps pumping clear water at sea level at 85°F; net positive suction head for centrifugal hot water pumps; condensate pumps; instructions for installing centrifugal pumps; and special applications of centrifugal pumps.

Hydraulic Institute, Standard. Deep Well Turbine Pump Section, 1941. Covers introduction, definitions, types of principal component parts, conditions of sale, warranty, efficiencies, field testing, general information, friction losses in deep well columns, mechanical friction in turbine pump line shafts, power balance in deep well turbine pump, air line method of determining depth of water level, and method of plumbing a well.

Hydraulic Institute, Standard. Reciprocating Pump Section, 1941. Covers reciprocating displacement pumps, steam driven types, parts, and definitions; reciprocating displacement pumps, power driven types, parts, and definitions; correction chart for temperature or viscosity; table of capacities for displacement pumps; deep well power pumps; and instructions for installing and operating pumps, reciprocating types.

Hydraulic Institute, Standard. Rotary Pump Section, 1942. Covers general information on rotary pumps, instructions for installing and operating rotary pumps, and locating trouble.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Centrifugal Fire Pumps. Standards for the Installation of Centrifugal Fire Pumps. Covers centrifugal fire pumps, electrical driving and control of pumps, steam turbines driving centrifugal fire pumps, gasoline engine driving of centrifugal fire pumps, Diesel engine driving of centrifugal fire pumps, tests for acceptance, and operating instructions for centrifugal fire pumps.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Specifications for Auxiliary Pumpers. Covers provisions applying to pump assembly, special provisions for automobile truck units, special provisions for trailer units, trailer pumpers, advantages and disadvantages of trailer pumpers.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Steam Fire Pumps. Operation and maintenance of national standard steam fire pumps. Covers general requirements, steam supply, national standard pump sizes, suction supply, priming, pump operation, testing, maintenance, locating trouble, water end of pump, nozzle discharge tables, rating charts, and automatic control.

U. S. Gov., Army Air Forces. Specification 28167-C; 1942. Pump; Vacuum, Type B-3, Aircraft, Engine-Driven.

U. S. Gov., Army Air Forces. Specification No.28364; 1940. Pump; Fuel, Transfer, Type D-10, Electric Motor Driven.

U. S. Gov., Army Air Forces. Specification 28367-B (1); 1942. Pump; Air, Type B-7, Vacuum-Aircraft, Engine-Driven.

U. S. Gov., Army Air Forces. Specification 28371-B (1); 1941. Pump; Hydraulic, Oil, Engine and Electric Motor Driven, General Specification for.

U. S. Gov., Army Air Forces. Specification No.28397; 1940. Pump; Fuel, Power-Driven, Type G-11.

U. S. Gov., Army Air Forces. Specification 28422-A-1; 1944. Pump; Fuel Booster, Type B-5B, Electric Motor Driven.

U. S. Gov., Army Air Forces. Specification 28446-A; 1942. Pump; Vacuum, Type B-13A, Aircraft, Engine-Driven.

U. S. Gov., Army Air Forces. Specification No.28457; 1942. Pump; Hydraulic, Oil, Type B-14, Engine-Driven, Aircraft.

U. S. Gov., Army Air Forces. Specification No.28486; 1943. Pump; Air, Rotor Driven, Fuel Booster, Type K-1.

U. S. Gov., Army Air Forces. Specification No.28491; 1943. Pump; Fuel or Oil, Type D-17, Power Driven, Transfer.

U. S. Gov., Army Air Forces. Specification No.28619; 1944. Pump; Fuel Booster, Type B-18, Electric, Motor Driven.

U. S. Gov., Army Air Forces. Specification 40270-B; 1941. Pump; Aircraft, Propeller Anti-Icing Fluid Metering, Direct-Current Operated.

U. S. Gov., Army-Navy Aeronautical Specification, AN-P-11-1; 1945. Pumps; Engine-Driven, Hydraulic.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-50-1; 1944. Pumps; Engine-Driven, Air.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-52-1; 1944. Pumps; Power-Driven, Fuel, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-55; 1944. Pumps; Fuel, Power-Driven, 200 G.P.H.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-56; 1944. Pumps; Fuel, Power-Driven, 400 G.P.H.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-57; 1944. Pumps; Fuel, Power-Driven, 700 G.P.H.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Pump; Tractor-Mounted.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.275; Pumps; Power Take-Off, Gear-Driven.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-273. Pump; Portable Power.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-173. Pump and Well for Water Supply Systems.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.36. Centrifugal Pumping Units; Small, Portable.

U. S. Gov., Navy Dept. Specification 11P5b; 1944. Pumps; Centrifugal, for Shipboard Use.

U. S. Gov., Navy Dept. Specification 11P8b; 1944. Pumps; Portable, Air-Turbine-Driven.

U. S. Gov., Navy Dept. Specification 11P9b; 1944. Pumps; Portable, Gasoline-Engine-Driven.

U. S. Gov., Navy Dept. Specification 11P10b; 1944. Pumps; Portable, Submersible, With Alternating-Current Motors.

U. S. Gov., Navy Dept. Specification 11P11b; 1944. Pumps; Submersible, Portable, With Direct-Current Motors.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Pumping Unit, 1944. Centrifugal, double suction, horizontal split case, bronze fitted, complete with direct-connected motor and bed plate.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Pumps; Water, 1944. Duplex, horizontal, size 4 1/2 in. x 2 3/4 in. x 4 in.; steam-end working pressure (maximum), 200 lb. per square inch; maximum liquid pressure per square inch, 250 lb.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 87-1C; 1943. Pumping Set; Centrifugal, Gasoline Engine Driven, Capacity 55 G.P.M.

References.—Gasoline filling station pumps, *see* 793.6; automobile truck fire pumps, *see* 722.2; methods of test, definitions, classification, *see* 755.0; oil well pumps, *see* 754; cast iron, *see* 611.11; shafts and steel forgings, *see* 611.52, 611.51; tolerances for metal fits, *see* 615.83.

755.2 ACCESSORIES AND PARTS FOR PUMPS

U. S. Gov., Army-Navy Aeronautical Specification AN-F-31; 1943. Filters; Air Pump Suction Relief Valve.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-36; 1944. Filter Assembly; Fluid Metering Pump.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-41-1; 1944. Separators; Air Pump Oil.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-S. Outfits; Pump Accessory List.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2300A; 1938. Pump; Filter and Coupling for.

References.—Rubber pump valves, *see* 707.3.

755.3 HAND PUMPS

Society of Automotive Engineers. Aeronautical Standard No.22; 1942. Pump; Hydraulic Hand. Diagrammatic dimensional drawing and requirements for total handle travel, pump displacement, and rated operating pressure.

U. S. Gov., Army Air Forces. Specification 28476 (1); 1943. Pump; Fuel Hand Primer, General Specification for.

U. S. Gov., Army Air Forces. Specification 28477 (1); 1943. Pump; Fuel Hand Primer, Type E-6.

U. S. Gov., Army Air Forces. Specification 28478 (1); 1943. Pump; Fuel Hand Primer, Type E-7.

U. S. Gov., Army Air Forces. Specification 40559-A; 1941. Pump; Gasoline Servicing, Hand.

U. S. Gov., Army Air Forces. Specification No.40784; 1944. Pump; Hand Air Deflation.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-14b; 1944. Pumps; Hydraulic Hand.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-37-1; 1944. Pumps; Hand-Operated Engine Primer.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-48a; 1944. Pumps; Plastic Hand Air.

U. S. Gov., Dept. of Agriculture, Forest Service: Specification for Pump; Low-Pressure, Semiportable.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-277. Pump; Back Pack, Hand.

U. S. Gov., Federal Specification XX-P-746; 1942. Pumps; Tire, Hand-Operated. Covers one type and two classes—(A) high-pressure tire and (B) balloon tire. Gives requirements for material, workmanship, components, pump cylinder, cylinder base, cylinder cap, plunger, plunger rod, handle, pump check valve, rubber hose, hose tie connector, finish, and marking; detail requirements for each class; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 11P6b; 1944. Pumps; Handy-Billy.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Pumps, 1943. Rotary, cam and gear type, hand-driven, for transfer of oil, water, etc.

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-28113-A; 1929. Pumps; Hand, Refueling, Type D-3 (Wobble).

U. S. Gov., U. S. Army, Army Air Forces. Specification 95-28191; 1940. Pump; Hand, Fuel, Type D-4.

U. S. Gov., Veterans Administration. Specification VA-MC-163a; 1939. Gasoline Pump; Hand-Operated.

References.—Gasoline filling station pumps, *see* 793.6.

755.9 MISCELLANEOUS PUMPING EQUIPMENT

U. S. Gov., Army Air Forces. Specification No.40613; 1943. Segregator; Fluid, Type A-6.

U. S. Gov., Army Air Forces. Specification No.40614; 1943. Segregator; Fluid, Type A-7.

U. S. Gov., Army Air Forces. Specification No.40481; 1944. Segregator; Fluid, Type D-6, Tank Car.

U. S. Gov., Army Air Forces. Specification No.40482; 1944. Segregator; Fluid, Type D-7, Portable Pipe Line.

756. GAS PRODUCERS

American Society of Mechanical Engineers. Power Test Code. Gas Producers, 1928. Intended primarily for tests of producers whose gas is used for power purposes; with auxiliary sections covering general considerations, pressure measurement, temperature measurement, heat of combustion, flue and exhaust gas analysis, determination of quality of steam, measurement of time, and humidity determinations.

National Board of Fire Underwriters. Internal Combustion Engines and Coal Gas Producers, No.37; 1934. Recommended good practice requirements for installation and use. Covers internal combustion engines giving definition of special terms, location of engines, capacity and location of fuel tanks for carburetion engines, capacity and location of fuel tanks for compression ignition engines, withdrawal of fuel from tank, fuel piping and fittings, carburetor, fuel feed cup on mixing valve, ignition and starting, exhaust piping, muffler or exhaust pot, lubricating oil drips, pans, etc., engine base, gas pressure regulators, gas bag, and care and attendance; and covers coal gas producers giving pressure systems and suction systems.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Coal Gas Producers. Recommended good practice requirements for the installation and use of coal gas producers. Covers pressure systems and suction systems.

U. S. Gov., Army Air Forces. Specification 40477-A (1); 1944. Generator; Portable Oxygen.

U. S. Gov., Army Air Forces. Specification No.40792; 1944. Plant; Mobile Oxygen-Generating, Type A-1, Gas.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-50; 1943. Generator ML-185-( ).

References.—General test code requirements, *see* 700; oil efficiency for water gas operation, *see* 997.2; gas codes and gas testing, *see* 997.2.

760-769 METAL-WORKING MACHINERY

760. GENERAL ITEMS

American Society of Mechanical Engineers. I.S.A. Tolerance Systems, 1942. This unified system of cylindrical fits was developed by the Inter-national Standards Assn. The main features are the reference temperature for limit gages is 20°C. nominal size range extends from 0.04 to 19.69 in., fits are given in the basic hole and the basic shaft system, tolerances are unilateral, the series of shafts and holes may be combined at will, and manufacturing tolerances.

American Society of Mechanical Engineers. Manual on Cutting of Metals, 1939. Gives 245 tables of data covering the machining of 35 commonly used steels; cutting speeds and horsepower; extensive table concerning 289 steels and conditions; a discussion of tool shapes and performances; and drawings of tool shapes.

National Safety Council. American Standards Assn., B11-1937. Safety Code for Power Presses and Foot and Hand Presses. Covers presses fitted with rams or plungers for blanking, trimming, drawing, punching, or stamping material, plate shears and plate punches. Rules for providing proper foundations, for working space, lighting, means of disconnecting power, guarding of belts, pulleys, shafts, gears, switches, feeding mechanisms, inclosure of ram, limitation of ram stroke, gate guards, two hand tripping devices, sweep guards, etc.

National Safety Council. Approved as American Recommended Practice by American Standards Assn., B24-1927. Safety Code for Forging and Hot Metal Stamping. Drop forgings and other hammer forgings; includes all hazards peculiar to the forging industry and associated with such machines, but not including cold extrusion of nonferrous metals or hydraulic presses, except small types of the latter. Hot pressing, bull dozing, bolt heading, and rivet making machines, not included. Published by U. S. Gov., Dept. of Labor, Bureau of Labor Statistics, Bulletin 451.

U. S. Gov., Dept. of Labor, Div. of Labor Standards. Special Bulletin 7; 1942. Suggested Standards for Industrial Safeguards. Includes metal working machinery. Covers bar stock machine, milling machine cutter guard, planers, power presses, and squaring shears.

761. MACHINE TOOLS

U. S. Gov., Navy Dept. Specification 40T2d; 1936. Tools; Portable, Pneumatic.

761.1 LATHES

National Machine Tool Builders' Assn. Accuracy of Engine Lathes. Recommended standards of accuracy in tabulated form for tool room lathes, 12 in. to 18 in. inclusive engine lathes, and 20 in. to 36 in. inclusive engine lathes. Approved by American Standards Assn. as American Defense Emergency Standard B5.16-1941.

U. S. Gov., Navy Dept. Specification 40L1g; 1944. Lathes; Engine, Motor-Driven, Medium-Heavy-Duty, 14-Inch, Shipboard Use.

U. S. Gov., Navy Dept. Specification 40L2b; 1944. Lathes; Cabinet, Precision, Motor-Driven, Shipboard Use.

U. S. Gov., Navy Dept. Specification 40L3d; 1944. Lathes; Engine, Motor-Driven, Medium-Heavy-Duty, 16-Inch, Shipboard Use.

U. S. Gov., Navy Dept. Specification 40L4c; 1944. Lathes; Engine, Motor-Driven, Medium-Duty, 14-Inch, Submarine Use.

U. S. Gov., Navy Dept. Specification 40L5a; 1944. Lathes; Engine, Motor-Driven, Heavy-Duty, Shore Use.

U. S. Gov., Navy Dept. Specification 40M3a; 1942. Mandrels; Lathe, Expansion.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Lathes, for Garages.

References.—Standard driving speeds and shaft diameters, *see* 760.

761.2 MILLING MACHINES

U. S. Gov., Navy Dept. Specification 40M5c; 1944. Machines; Boring, Drilling, and Milling, Horizontal, Motor-Driven, 4-Inch Spindle, Shipboard Use.

U. S. Gov., Navy Dept. Specification 40M6d; 1944. Machines; Milling, Universal, Motor-Driven, Shipboard Use.

U. S. Gov., Navy Dept. Specification 40M10b; 1944. Machines; Milling, Motor-Driven, Universal, Small Ship Type.

U. S. Gov., Navy Dept. Specification 40M11a; 1944. Machines; Milling, Universal, Horizontal, Heavy-Duty, Motor-Driven, Shore Use.

U. S. Gov., Navy Dept. Specification 40M12a; 1944. Machines; Milling, Plain, Horizontal, Heavy-Duty, Motor-Driven, Shore Use.

References.—Standard driving speeds and shaft diameters, *see* 760.

761.9 MISCELLANEOUS MACHINE TOOLS

U. S. Gov., Navy Dept. Specification 40C1a; 1944. Chucks; Drill.

U. S. Gov., Navy Dept. Specification 40M5c; 1944. Machines; Boring, Drilling, and Milling, Horizontal, Motor-Driven, 4-Inch Spindle, Shipboard Use.

U. S. Gov., Veterans Administration. , Specification VA-M-187; 1936. Electric Drill.

References.—Portable electric drills, reamers, buffers, and grinders, *see* 711.24; pneumatic, *see* 615.9.

762. POWER PRESSES AND FORGING HAMMERS

762.1 POWER PRESSES

U. S. Gov., Navy Dept. Specification 41P29a; 1941. Presses; Arbor, Hydraulic, Hand-Operated, 25-Ton Capacity, Shipboard Use.

U.S. Gov., Veterans Administration. Specification VA-M-169; 1936. Drill Press.

U. S. Gov., Veterans Administration. Specification VA-M-207; 1936. Mechanical High Speed Type Press; 28-Ton Capacity.

References.—Safety codes, *see* 760.

762.2 FORGING HAMMERS

References.—Safety codes, *see* 760.

763. THREAD-CUTTING AND SCREW MACHINES

U. S. Gov., Veterans Administration. Specification VA-M-180; 1936. Screw Cutting Lathe.

U. S. Gov., Veterans Administration. Specification VA-MC-175e; 1939. Machine; Pipe Threading and Cutting, Portable.

U. S. Gov., Veterans Administration. Specification VA-MC-301a; 1939. Power Pipe Threading Vise and Stand.

References.—Standard shaft sizes, standard driving speeds, *see* 760.

764. PUNCHING, SHEARING, AND ROLLING MACHINES

U. S. Gov., Navy Dept. Specification 40P1d; 1944. Punches, Machines; Bushings, Coupling Nuts, Dies, High Dies, and Punches.

References.—Safety code for punching machines and shearing machines, *see* 760.

765. PARTS AND TOOLS FOR METALWORKING MACHINERY

American Foundrymen's Assn. American Standards Assn., Z 43.-1941. Grinding, Polishing, and Buffing Equipment Sanitation. Prescribes the use of exhaust hoods and systems in removing dust, dirt, fumes, and gases generated through the grinding, polishing, and buffing of ferrous and nonferrous metals by means of grinding, polishing, scratch brushing, abrasive cutting-off wheels, grinding and polishing straps and belts.

American Society of Mechanical Engineers. Joint sponsor with National Machine Tool Builders Assn. and Society of Automotive Engineers. American Standards Assn., B5c-1930. Milling Cutters. Establishes dimensions for—plain milling cutters for heavy and light duty, side milling cutters, half-side milling cutters, staggered tooth milling cutters, metal slitting saws, single and double angle milling cutters, end mills, T-slot cutters, shell end mills, involute gear cutters, with large diameters, cutters for fluting reamers, concave cutters, convex cutters, corner rounding cutters, sprocket wheel cutters and arbors.

American Society of Mechanical Engineers. Joint sponsor with National Machine Tool Builders Assn. and Society of Automotive Engineers. American Standards Assn., B5.1-1941. T Slots, Their Bolts, Nuts, Tongues, and Cutters. Tables of dimensions and tolerances of standard sizes.

American Society of Mechanical Engineers. Sponsored by Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards Assn., B 5.2-1943. Tool Shanks and Tool Posts for Lathes, Planers, Shapers, Boring Mills, and Turret Lathes. For standardization of terminology and definitions; corresponding tool post openings and recesses; simplification of list of preferred sizes of tool bits, tool holders, tool shanks, and tools; and cross sections and lengths of shanks of square and rectangular single point tools. Covers terminology and definitions, illustrative diagrams, and tables showing sizes.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards Assn., B5.4-1939. Taps, Cut and Ground Threads. General dimensions and working tolerances for hand taps, pulley taps, boiler taps, mud or washout taps, staybolt taps, pipe taps, and combined pipe tap and drill. Thread limits are included for fractional size taps, machine screw taps, straight boiler and staybolt taps, straight pipe taps, bent shanker tapper taps, and taper pipe taps. Also definitions, table of sizes and pitches for fine and coarse thread series, and marking.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders Assn. American Standards Assn., B5.5-1932. Rotating Air Cylinders and Adapters. Covers four sizes of standard adapters—(A) for 3- and 4 1/2-in. cylinders, (B) for 6- and 8-in., (C) for 10- to 18-in., and (D) 20-in. cylinder or other power operated device having a draw pull of 26,000 to 40,000 lb. Length of stroke of standard cylinders, position of piston rod at end of stroke, diameter of piston rod, and size of tapped hole in piston rod are standardized so that air cylinder draw rods do not require fitting to individual cylinders.

American Society of Mechanical Engineers. Joint sponsor with National Machine Tool Builders' Assn. and Society of Automotive Engineers. American Standards Assn., B5.6-1941. Jig Bushings. Tables of dimensions and tolerances, includes headless and head types press fit wearing bushings; slip and fixed head types renewable wearing bushings; and headless and head types liner bushings.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards Assn., B 5.7-1943. Circular and Dovetail Forming Tool Blanks. Covers sizes and types of circular and dovetailed forming tool blanks and the associated mounting portions of their respective holders for use on automatic screw machines. The machines have been classified, for reference purposes, into six different groups of comparable stock capacities. Covers definitions, illustrative drawings, and tables giving reference groups and dimensions.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards Assn., B 5.8-1936. Chucks and Chuck Jaws for Turret Lathes and Automatic Lathes. Permits interchangeability of chucks and fixtures on different makes of turret lathes, automatic lathes, and engine lathes. Controlling dimensions are established for all chucks from 6-in. to 36-in. diameter of both medium and heavy duty types. There are also dimensions for an extra heavy series of chucks with serrated master jaws, and for power-operated and hand-operated chucks of two-, three-, and four-jaw types.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards

Assn., B5.9-1936. Lathe Spindle Noses for Turret Lathes and Automatic Lathes. Nomenclature, recommendations, and diagramatic drawings and tables of dimensions of spindle noses, location of holes and driving buttons, chucks and face plates, clamp rings, master ring gages, master plug gages for chucks and face plates, outside micrometer working gages for chucks and face plates, dog plates, cam lock nuts, cam lock screws, stud locking screws, cams, cam screws, and cam springs.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards Assn., B 5.10-1943. Machine Tapers; Self-Holding and Steep Taper Series. Establishes—(1) standard practice for the slope of self-holding machine and steep tapers, (2) the detailed dimensions for this type of taper tool shank, and (3) the corresponding dimensions for the taper stock in the spindle of the machine. Covers definitions, gaging, nomenclature, illustrative diagrams, and gives tables showing dimensions.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards Assn., B 5.11-1937. Adjustable Adapters for Multiple Spindle Drilling Heads. The purpose of these adapters is to secure vertical adjustment for taper shank tools when used with multiple spindle drilling heads. Tables contain general dimensions of assembly, detail dimensions for adjustable adapter body, and general dimensions for adjustable adapter nuts. Specifications include material, finish, marking, and tolerances.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards Assn., B5.12-1940. Twist-Drills; Straight Shank. Establishes—(1) American standard practice for the terminology and definitions of straight shank twist drills, and (2) the preferred diameters of straight shank drills varying in diameter from 0.0135 to 0.500 in., and (3) the corresponding drill lengths and flute lengths.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and National Machine Tool Builders' Assn. American Standards Assn., B5.13-1939. Terminology and Definitions for Single-Point Cutting Tools for Lathes, Planers, Shapers, Turret Lathes, Boring Mills, Etc.

American Society of Mechanical Engineers. Joint Sponsors with National Machine Tool Builders' Assn. and Society of Automotive Engineers. American Standards Assn., B 5.14-1941. Reamers. Gives the general dimensions of 30 standard types of reamers and related tools, along with the magnitude and direction of the tolerances, including the number of flutes in the various types. Special attention is given to terminology and definitions. Thirty-eight sketches are included, illustrating the various types of reamers, also terms applying to reamers.

American Society of Mechanical Engineers. Joint sponsor with Society of Automotive Engineers and The National Machine Tool Builders' Assn. American Standards Assn., B5.15-1939. Involute Splines; Side Bearing. A basis for the design of interchangeable splined shafts and fittings. Gives 18 dimensional tables; 10 for 30° involute splines with 6, 10, 16, 24, and 36 teeth; 2 for measurement of involute splines; 1 on hobs for involute splines; and 5 tables of hob dimensions. Explanatory notes, 15 illustrating sketches of the relationship of hobs and splines, and a diagrammatic comparison of spline depths, shown as percentage of pitch diameter.

American Society of Mechanical Engineers. Woodruff Keys, Keyslots, and Cutters. American Standards Assn., B-17f-1930. Dimensions and tolerances for standard Woodruff keys, keyslots, and cutters, standard key numbers. For keys ranging from 1/16 by 1/2 in. long to 3/8 by 1 1/2 in. long. Tables give overall dimensions of keys, distance from center of circle forming the key profile to the top of the key, and overall dimensions with maximum and minimum limits for keyslots of the series established. For the two series of keyslot cutters adopted, overall dimensions and number of teeth for both fine and coarse series, tolerances, and general design features.

American Society of Mechanical Engineers. Joint sponsor with American Gear Manufacturers' Assn. and Society of Automotive Engineers. American Standards Assn., B29a-1930. Roller Chains, Sprockets, and Cutters. Includes cutters for sprockets, types of space cutters, construction, data for laying out cutter outlines, recommended cutter sizes for standard roller chain and block roller chain sprockets.

American Standards Assn., C 74-1942. Machine Tool Electrical Standards (American War Standard). Covers power driven, complete metal working machines not portable by hand, having one or more tool and work holding devices, used for progressively removing metal in the form of chips. Gives diagrams, control, motors, wiring, grounding, electrical accessories, and standard wiring diagram symbols.

Grinding Wheel Manufacturers Assn. Standard Steel Bushings for Grinding Wheels, 1939. Covers hexagonal top and bottom, round top and hexagonal bottom, and round top and square bottom. Gives dimensional drawings for each type.

Society of Automotive Engineers. 1944 Handbook, Section 8—Tools and Production Equipment. S.A.E. Standard Woodruff Key Slot Cutters and Gages, revised 1930. Adopted by American Standards Assn., B17f-1930. Includes diagrams and tables of sizes and dimensions for key slot cutters, key slot gages, and gage handles; and gives method for gaging key slot depth limits.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R36-34; 1934. Milling Cutters. This recommendation establishes a schedule of simplified sizes and varieties of milling cutters, giving various dimensions and size of hole. Sponsored by the Metal Cutting Tool Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R51-29; 1929. Die Head Chasers, for Self-Opening and Adjustable Die Heads. This recommendation establishes a list of standard stock sizes and threads per inch for national coarse thread and fine thread series, for S.A.E. spark plug and bushing thread, for lighting fixture and fitting thread, for railway sizes, and for pipe thread.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R115-30; 1930. Full Disk Buffing Wheels. This recommendation establishes a simplified list of diameters for full disk 20-ply buffing wheels. Initiated by the industry (now represented by the Buff and Polishing Wheel Manufacturers Assn.).

U. S. Gov., Navy Dept. Specification 40C2; 1943. Cutters; Milling.

U. S. Gov., Navy Dept. Specification 40P1d; 1944. Punches, Machine; Bushings, Coupling Nuts, Dies, High Dies, and Punches.

U. S. Gov., Navy Dept. Specification 40S1; 1925. Sockets; Tool, Morse-Taper-Shank, Steel.

U. S. Gov., Navy Dept. Specification 41D9b; 1941. Dies; Grommet-Inserting.

U. S. Gov., Navy Dept. Specification 41T15g; 1936. Dies; Diestocks; Taps; and Wrenches, Tap.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Buffing Outfits.

References.—Portable electric drills, reamers, buffers and grinders, *see* 711.24; hack saw blades, *see* 615.62; abrasive and grinding wheels, *see* 541.3; carbon tool steel, alloy tool steel, *see* 603.32, 621.35; heat treatment of tool steels, blanking dies, punches, shear blades, *see* 600.5; tolerances on metal fits, *see* 615.82.

766. POWER TRANSMISSION MACHINERY

766.0 GENERAL ITEMS

American Society of Mechanical Engineers. Joint sponsor with National Bureau of Casualty and Surety Underwriters and International Assn. of Industrial Accident Boards and Commissions. American Standards Assn., B15-1927. Safety Code for Mechanical Power-Transmission Apparatus. Requirements on guards and guarding for connecting rods, cranks, flywheels, shafting, pulleys, belts, link belts, chains, ropes, gears, sprockets, cams, couplings, clutches, counterweights, up to but not including point of operation; requirements for bolts, keys, set screws, and oil cups; rules for care and operation of equipment.

U. S. Gov., Dept. of Labor, Div. of Labor Standards. Special Bulletin 7; 1942. Suggested Standards for Industrial Safeguards. Includes transmission machinery. Covers belts, clutches and couplings, cranks and connecting rods, fly wheels, materials and construction of guards, and shafting.

766.1 POWER TRANSMISSION AND CONVEYOR CHAINS AND SPROCKET WHEELS

American Petroleum Institute, Div. of Production, Standard No.7; 1944. Transmission Standards. For equipment and machinery used for drilling and production purposes in the oil industry. Applies to shafting and bored members, keys and keyways, and chains. Covers material, workmanship and finish, marking, shafting and keys basic standards, shafting and keys detailed dimensions, chain, inspection and rejection, and appendices.

American Petroleum Institute, Div. of Production. Standard 11-E; 1941. Specification for Rating of Steel Helical and Herringbone Gear Speed Reducers for Pumping Machines (including Rating Form for Rotary Counterbalances). Gives scope, marking, limitations, design of gearing, design of housing, shafts and bearings, service and application, formulas, suggested method for computing well loads, rotary counter-balances, inspection and rejection, and appendices.

American Petroleum Institute, Div. of Production. Standard 11-E-1; 1941. Specification for Rating of Roller-Chain Speed Reducers for Pumping Machines. Provides a method of rating of roller-chain drives in speed reducers; does not cover chemical properties of material nor use of the equipment.

American Society of Mechanical Engineers. Joint sponsor with American Gear Manufacturers' Assn. and Society of Automotive Engineers. American Standards Assn., B29a-1930. Roller Chains, Sprockets, and Cutters. Includes cutters for sprockets, types of space cutters, construction, data for laying out cutter outlines, recommended cutter sizes for standard roller chain and block roller chain sprockets.

References.—Safety codes, *see* 766.0; methods of testing, general requirements for metals, *see* 600.1; cutters for roller chain sprockets, *see* 765; tolerances on metal fits, *see* 615.82.

766.2 BALL AND ROLLER BEARINGS

Anti-Friction Bearing Manufacturers Assn., Inc. Ball and Roller Bearing Standard Specification, 1942. Covers introduction; types and specifications for ball bearings, cylindrical roller bearings, spherical roller bearings, and tapered roller bearings; material and workmanship; sampling, inspection, and tests; packing and marking; and deviations from specification. Gives tables showing data for various types of ball bearings, cylindrical roller bearings, snap ring dimensions, ball thrust bearings, closer tolerances, and taper roller bearings.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Bearings; Roller, Tapered, Heavy-Duty. Covers definition, characteristics, types and sizes, uses, and substitutes.

Society of Automotive Engineers, Inc., joint sponsor with American Society of Mechanical Engineers. American Standards Assn., B3-1-1933, B3-2-1930, and B3.3-1933. Ball and Roller Bearings. Standard Annular Ball Bearings, Single Row Type (B3.1-1933) specifies the boundary dimensions and their tolerances, of annular ball bearings as affecting their interchangeability, for light, medium, and heavy series. Recommended Practice Annular Ball and Roller Bearings, Wide Type (B3.2-1930) is the same as the regular light, medium, and heavy series of wide type of the S. A. E. Standard (p. 285, 1930 edition S. A. E. Handbook) with extended sizes supplementing the regular light medium series only. Standard Angular Contact Ball Bearings (B3.3-1933) specifies dimensions and tolerances for light, medium, and heavy series.

Society of Automotive Engineers. 1944 Handbook, Section 1—Aeronautical Parts, Materials, and Codes. S. A. E. Standard Aircraft Ball Bearings, revised 1940. These bearings constitute nine series developed especially for use in aircraft for which the regular types are not so well suited. They are dimensioned entirely in decimal inches, the bores being in even increments of 1/16 in. Includes diagrams of each series with table of sizes, dimensions, and tolerances.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Standard Ball and Roller Bearings, revised 1944. The accompanying tables include the types, complete range of standard sizes and their boundry dimensions of standard ball and roller bearings commonly used for automotive and other industrial applications. Covers tolerances, aircraft control ball bearings, standard for measurements, conversion factors, rounding off numbers, eccentricity, corner radius and fillets, endplay, shielded bearings, bearing code numbers, types of ball and roller bearings, and tables giving types and sizes for various ball and roller bearings.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Standard Ball and Roller Bearing Lock Nuts and Washers, revised 1944. Gives drawings, size designations, and tables giving sizes and dimensions for ball bearing shafts, ball bearing lock nuts, ball and roller bearing lock washers, taper roller bearing shafts, and taper roller bearing lock nuts.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Standard Ball Thrust Bearings, revised 1944. Diagrams and tables of dimensions with tolerances for ball thrust bearings, self-aligning ball thrust bearings, and ball bearings.

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S. A. E. Standard Taper Roller Bearings, revised 1944. Diagrams and tables of dimensions with tolerances for various types of taper roller bearings.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R67-36; 1936. Taper Roller Bearings. This recommendation establishes a list of standard sizes of roller bearings for the light, medium, and heavy series, and steep angle taper roller bearings. Sponsored by the Society of Automotive Engineers.

U. S. Gov., Federal Specification FF-B-171; 1941. Amendment 2; 1942. Bearings; Ball. Covers two grades—(I) precision, and (II) standard; and nine types—(A) radial single row (light, 30 and 200 series; medium, 300 series; and heavy, 400 series); (B) angular contact, single row, single mounting (light, 7200 series; medium, 7300 series; and heavy, 7400 series); (C) angular contact, single row, duplex mounting (light, 7200 series; medium, 7300 series; and heavy, 7400 series; (D) radial and angular contact, double row (light, 5200 series; medium, 5300 series; and heavy, 5400 series); (E) radial, double row, self aligning (light, 1200 series; medium, 1300 series; and medium wide, 2300 series); (F) thrust, single-direction, flat face (medium, 20300 series; and heavy, 20400 series); (G) radial, single shielded, single row (light, 200 Z series; and medium, 300 Z series); (H) radial, double shielded, single row (light, 200 Y series; and medium, 300 Y series); and (S) radial, single row, inch (medium, S series). Covers material and workmanship; general requirements; detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification FF-B-186; 1941. Amendment 1; 1942. Bearings; Roller. Covers three classes—(a) light, (b) medium, and (c) heavy; three grades—(I) ultraprecision, (II) precision, and (III) standard; and four types—(A) cylindrical, standard width; (B) cylindrical, wide; (C) tapered, shallow angle; and (D) tapered, steep angle. Covers material and workmanship; general requirements; detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 42B5c; 1939. Bearings; Ball.

U. S. Gov., Navy Dept. Specification 42B6a; 1940. Balls; Bearing, Steel.

U. S. Gov., Navy Dept. Specification 42B10; 1937. Bearings; Roller.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Bearings; Tapered Roller.

References.—Steel for ball and roller bearings, *see* 621.31.

766.9 MISCELLANEOUS POWER TRANSMISSION MACHINERY

References.—Leather belting, rubber and balata belting, *see* 066.3, 207.3; cotton belting, hair belting, *see* 314.1; shafts and shafting, *see* 611.52; pulleys, pinions and gears, *see* 611.16, 611.55.

767. WELDING AND FLAME-CUTTING MACHINERY

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Welding. Include requirements for plans and specifications, approval of procedure, electrode approval, qualification of welding operators, workmanship and supervision, details of joints, forms of welds required, and tests.

American Institute of Electrical Engineers, No. 38; 1934. Joint sponsor with National Electrical Manufacturers Assn. American Standards Assn., C52.1-1933. Standards for Electric Arc Welding Apparatus. Includes d.c. generators, motor generator sets, a.c. transformers, and resistors, used in arc welding. Definitions, duty classification, rating, heating limits and methods of testing, measurement of efficiency, dielectric test, standard values for current and voltage. Efficiency limits not stated.

American Institute of Electrical Engineers, No. 39; 1934. Joint sponsor with National Electric Manufacturers Assn. American Standards Assn., C52.2-1933. Standards for Resistance Welding Apparatus. Applies to resistance welding transformers and apparatus for electro-percussive welding. Definitions, duty classification, rating, heating limits and measurement, measurement of input to transformer, dielectric test.

American Institute of Steel Construction. Tentative Standard Welded Connections for Tier Buildings, 1939. For welding of steel framed buildings; recommended principles for heavily coated electrodes, flexibility of connections, welding in cold weather, and fillet weld sizes, with diagrams of details.

American Society of Mechanical Engineers. Boiler Construction Code. Welding qualifications, 1943. Rules apply to the manual application of the arc and gas welding processes and to those ferrous metals which in their unwelded conditions will meet the requirements of the guided bend test prescribed in the code. Also outlines in detail the operator's qualification tests.

American Society for Metals. Metals Handbook, 1939 edition. Welding of Metals; General. Covers welding of metals.

American Standards Assn., Z49.1-1944. Safety in Electric and Gas Welding and Cutting Operations (American War Standard). Intended as a guide for the protection of workers from injury and illness and for the protection of property from fire or other damage arising out of the installation operation, and maintenance of electric and gas welding and cutting equipment. Gives definitions, installation and operation of gas welding and cutting equipment, installation and operation of arc-welding and arc-cutting equipment, installation and operation of resistance-welding equipment, fire prevention, protection of personnel, and ventilation and health protection.

American Transit Assn. Standard Rules for Arc Welding, W47-36; 1936. Covers instructions to welders, inspection of work and progress, maintenance of a daily record, a training course, and repairs and upkeep of machines. It also covers method of welding rail joints, cupped rail ends, and manganese-steel.

American Welding Society. An Investigation of Welded Seat Angle Connections, 1934. From an economic viewpoint it is desirable to know the minimum size of weld made necessary by the respective requirements of vertical shear and of bending, the bending being affected by the nature and position of the load. Covers synopsis, introduction, general statement of the problem, test program, test data, discussion of results, theoretical analysis, and recommendations for design.

American Welding Society. Code of Minimum Requirements for Instruction of Welding Operators. Part A—Arc Welding of Steel 3/16 to 3/4 Inch Thick, Tentative, 1942. Covers general requirements, equipment and facilities of the school, qualifications and duties of instructor, instruction in welding practice, instruction in welding theory, final tests, and appendices.

American Welding Society. Code of Minimum Requirements for Instruction of Welding Operators. Part B-1—Oxy-Acetylene Welding of Steel-Aircraft, 1944. Covers general requirements, equipment and facilities of the school, qualifications and duties of instructor, instructions in welding practice including course I and course II, instruction in related information, final tests, and appendices.

American Welding Society. Definitions of Welding Terms and Master Chart of Welding Processes, 1942. Includes definitions of general terms, types of joints and welds, details of joints and welds, arc welding, gas welding, resistance welding, brazing, thermit welding, forge welding, arc and oxygen cutting, testing and inspection, illustrative diagrams, and master chart of welding processes.

American Welding Society. Engineering Essentials for Welders, 1942. A presentation and discussion of the engineering aspects of welding residing in the hands of welders and those immediately responsible for fabrication and erection of welded structures. Covers introduction, forces and stresses, steel, welding design, stress paths, bending, temperature effects, fatigue stresses, conclusion, and appendix.

American Welding Society. Filing Classification of Welding, Brazing, Soldering and Cutting Processes, Materials, and Applications, 1936. Gives complete details for a standard filing or classification system covering the entire welding field and allied processes and may be used as either a filing system or an indexing system.

American Welding Society. Guide to the Weldability of Steels. A proposed system of determining the effect of welding procedure upon the ductility of the heated zone adjacent to the weld in plain carbon and alloy steels. Covers introduction, how to use this guide book for the solution of practical problems, the experimental basis of the system, and effects of secondary variables.

American Welding Society. Inspection Method Used in Manufacture of U-69 and U-70 Pressure Vessels, 1938. Where X-ray equipment is available it is recommended in place of plugs removed. This covers the application of the trepanned plug method. Gives selection of location and number of plugs removed, size of plugs and their removal, examination of plugs and their approval or rejection, and filling holes made by the removal of plugs.

American Welding Society. Measurement of Cooling Rates Associated With Arc Welding and Their Application to the Selection of Optimum Welding Conditions, 1943. To evaluate the weldability of steels for the arc-welding fabrication of tanks, gun mounts, and other war material for the purpose of selecting optimum welding conditions. Gives a detailed discussion of the subject with numerous charts showing curves and tables of data.

American Welding Society. Qualifying Welding Operators for Important Work, 1943. The purpose of this article is to present a general survey of the subject of welding operator qualification tests, and the qualifications required of welding operators for various types of work. Covers code requirements, A.W.S. standard qualification procedure, inspection agencies, requirements for government employment, table giving type of welding, title of code or specification, and name of sponsoring organization, field of application, and source from which copy of code may be obtained.

American Welding Society. Recommended Practices for Inspection of Fusion Welding, Tentative, 1942. Covers qualifications of welding inspectors, duties of inspectors, inspection and testing of welded structures, welding characteristics of ferrous metals, welding characteristics of nonferrous metals, and etching reagents.

American Welding Society. Recommended practice for the Spot and Seam Welding of Low Carbon Steel, 1943. An A.W.S. Emergency Standard. The data submitted on the following charts have been compiled by canvassing approximately 60 fabricators of mild steel structures and resistance welding equipment manufacturers. Discusses low carbon spot welding data, and low carbon steel seam welding data, and gives tables showing data for the two types of welding.

American Welding Society. Recommended Procedure To Be Followed in Preparing for Welding or Cutting Certain Types of Containers Which Have Held Combustibles, 1940. Applies to containers that may not be entirely free of combustible solids, liquids, vapors, dusts, and gases, when such containers are to be subjected to any type of hot work or operation that might create a spark or flame. Covers scope, general precautions, initial treatment, hot chemical method of cleansing, steaming method of cleaning, water filling treatment, inert gas treatment, and appendix.

American Welding Society. Report of the Structural Steel Welding Committee of the American Bureau of Welding, 1931. Covers introduction, procedure, qualification test results, adjustment of length and cross-section, program test results, miscellanea, conclusions. recommendations, fields for further research, and appendices giving detailed records.

American Welding Society. Report of Thermal Stresses and Shrinkage in Welded Ship Construction, 1941. The phenomena of shrinkage in welded joints creates a most important problem in welded ship construction—first, as a matter of dimension; and second, with regard to the stresses which would be set up in the structure. Gives introduction and discusses loss of dimension, distortion, residual or "locked-up" stress, conclusions, and appendix.

American Welding Society. Rules for Field Welding of Steel Storage Tanks, 1940. Amendments, 1942. These rules are intended to apply to the construction of fusion welded bulk storage tanks of the above-ground type for holding liquid products operating generally at atmospheric pressure or at not over 15 lb. per square inch gage pressure. Covers materials, qualification of welding procedure and testing of welding operators, weld design values, joint design, welding design details, details of welding procedure, stipulations for testing welded shell joints by sectioning methods, tank testing, repairs, and appendix.

American Welding Society. Rules for Fusion Welding Piping in Marine Construction, 1944. Prescribed for plain carbon steel piping in which the carbon does not exceed 0.35 percent. Covers qualification of welding procedure, rules for qualification of welding operators, design of piping, layout and dimensions of piping, types of welded joints to be used, class 2 piping, preheating, stress relieving, radiographic and other tests, stamping of work, and hydrostatic tests.

American Welding Society. Sponsored by American Institute of Electrical Engineers and American Society of Mechanical Engineers. American Standards Assn., Z 32.1-1942. Graphic Symbols for Use on Drawings in Welding and Instructions for Their Use. Intended to provide means for conveying the information from the designer to the workmen.

American Welding Society. Standard Methods for Mechanical Testing of Welds, 1942. These standards are the best compromise which could be found in the expectation that existing codes and specifications could be revised to comply with this standard with the least trouble and expense. It gives the requirements for the specimens, the testing procedure, and the methods of obtaining the properties.

American Welding Society. Structural Failures in Welded Ship Construction, Tentative, 1944. Covers principal factors causing failure, definitions, residual stresses, means to reduce residual stresses, reaction stresses, general precautions relative to reaction stresses, stress concentration, cold weather, metallurgical considerations, and engineering control.

American Welding Society. Tentative Standards and Recommended Practices and Procedures for Spot Welding of Aluminum Alloys, 1942. Covers standards of weld quality, material preparation, welding technique, methods of testing, inspection, design, welding equipment and installation, personnel, production, and appendix.

American Welding Society. Tentative Standard Qualification Procedure, 1941. Includes the method to be pursued in investigating and qualifying a welding procedure and outlines the method of qualifying welding operators. They are intended to apply only to the manual application of the arc-and-gas-welding processes, and to those ferrous metals which in their unwelded condition will meet the requirements of the guided bend test prescribed.

American Welding Society. Welded Beam-Column Connections, 1936. This paper deals with beam-column connections designed for certain end restraints. Covers preparation of specimens, test procedure, discussion of results of tension tests, analysis of connections, discussion of cantilever test, discussion of complete beam-to-column connections, proposed method of design, and conclusions.

American Welding Society. Welding Standards for Alternate Aircraft Steels, Tentative, 1944. The tests herein described are presented as satisfactory weldability tests to compare proposed alternate steels with standard aircraft steels. Gives details for tee-bend test, transverse butt-joint tension test of 1/4 in. plate, transverse butt-joint tension test of 1/8 in. sheet, transverse butt-joint tension test of 1 in. tubing, and welded-tube triangle test.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1941. Arc welding. Gives requirements for arc welding and covers electric metallic process, welding cast iron; gives details for metallic arc welding various grades of steel, steel alloy, and various metals; and for carbon arc welding mild steel and copper.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1941. Electric Welding. Includes definitions and fundamentals, metallurgical characteristics of a weld, weldability of ferrous metals, and chemistry of welding; spot, butt, and seam welding machines; control of current, resistance, and time; inertia, mechanical, motor, induction, electronic, compensated, and automatic timers; precision control; and interrupted spot welding, and qualification test for welders.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1941. Oxy-Acetylene Welding and Cutting.

Covers introduction, oxygen, regulators, accessories, oxy-acetylene flame, setting up equipment, flashback or sustained backfire, cutting, oxy-acetylene welding, equipment, and information a welder should know.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice. 1941. Welding of Metals and Alloys. Covers technique and procedure for welding of metals and alloys in general use, and oxy-acetylene welding procedure for metals and alloys.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice, 1941. Track Welding or Heat Treating in Track Circuit Territory. Precautions to be observed in the use of electric arc or oxygen-acetylene in the vicinity of railway signal circuits. Grounding, insulation replacement, etc.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1944. Fusion Welding and Bronze Welding, Limits and Regulations. Recommended Practice, revised 1943. Requirements for the certification of operators, preparation, welding procedure, weld contour, building up worn surfaces, heat treatment after welding, marking welds, welding limitations, and diagrammatic illustrations.

Heating, Piping, and Air Conditioning Contractors National Assn. Specifications for Metallic Arc Welding of Steel Pipe, Fittings, and Flanges, No.1; 1939. Describes process, base metal and filler metal to meet A.S.T.M. standards, preparation of base material, nature of electric current, number of beads and current characteristics, cleaning, defect, peening, heat treatment, and illustrations of welds.

Heating, Piping, and Air Conditioning Contractors National Assn. Specifications for Oxy-Acetylene Welding of pipes, Fittings, and Flanges, No.2; 1939. Gives requirements for base material conforming to A.S.T.M. specifications, limits carbon content to .35 for filler metal, preparation of base material, size of welding tip, nature of flame, method of welding, cleaning, defects, heat treatment, and dimensional drawings of standard welds.

Heating, Piping, and Air Conditioning Contractors National Assn. Specifications for Metallic Arc Welding of Carbon Molybdenum Pipe, Fittings, and Flanges, No.3; 1939. Covers requirements for base materials conforming to A.S.T.M. specifications, but limits carbon content to .35 for filler metal, and preparation of base material, nature of current, number of beads of welding and current characteristics, cleaning, defect, peening, preheating, stress relieving, and illustrations of typical welds.

Heating, Piping, and Air Conditioning Contractors National Assn. Standard Manual on Pipe Welding, 1931. This standard covers welding apparatus, including regulators, welding and cutting torches, acetylene generators, accessories, oxygen, acetylene, and welding rod; also gives mechanics of welding and cutting, including pipe welding and tests, designing, laying out and fabricating welded pipe joints and fittings, and application to pipe installation. Includes specifications for welding of steel and wrought iron pipe, strength of welds, precautions and safe practices.

Heating, Piping, and Air Conditioning Contractors National Assn. Standard Manual on Pipe Welding, 1931. This standard includes specifications for welding of steel and wrought iron pipe, both standard and extra heavy weight, plain or galvanized, for steam and process piping operating at pressures not exceeding 250 lb., and temperatures not exceeding 406° F. Pipe to meet A.S.T.M. specifications, qualifications of welder, design of welded joints, tests, and diagrams of standard operations.

International Acetylene Assn. Bronze Welding or Brazing of Iron and Steel by the Oxy-Acetylene Process. The growing importance of bronze welding makes this pamphlet a very timely one.

International Acetylene Assn. Effect of Flame-Cutting on Steel. The original pamphlet consisted of not much more than a bibliography, but has now been expanded to a treatise of some 60 pp., completely covering the subject.

International Acetylene Assn. Hard-Facing by the Oxy-Acetylene Process. Economics of hard-facing, the various hard-facing materials and factors determining their selection, complete procedures for applying hard-facing materials to steel and cast iron, and typical applications of hard-facing in important industries. Hardness tests and conversion scales are included in the appendix.

International Acetylene Assn. Miscellaneous Uses of the Oxy-Acetylene and Air-Acetylene Flames. A pamphlet devoted to the many uses of the oxy-acetylene and air-acetylene flames, other than in welding and cutting.

International Aceytlene Assn. Oxy-Acetylene Cutting. A comprehensive treatise on manual and machine flame-cutting and flame-machining, including the chemistry of the processes, the cutability of various metals, etc.

International Acetylene Assn. Oxy-Acetylene Welding and Its Applications. The chemistry of the welding process, the technique of welding various ferrous and nonferrous metals and alloys, the testing of welds, etc.

International Acetylene Assn. Safe Practices for Installation and Operation of Oxy-Acetylene Welding and Cutting Equipment. Covers the storage of calcium carbide and gases, as well as the installation, operation, and use of oxy-acetylene welding and cutting equipment. Chapters are devoted to eye protection, safe clothing, fire prevention, accident prevention, and industrial health.

International Acetylene Assn. Sample Pipe Welding Specifications. To meet the demand of architects and engineers for specifications covering the welding of piping to be incorporated in any general specifications.

International Aceytlene Assn. Standard Hose Connection Specifications, 1939. Includes four classes of hose connections, for oxygen and for fuel gas, size, type and kind of thread, etc., optional material, diameter of drilling through external fitting and gland, form of end shank, etc.

International Acetylene Assn. Tests for the Selection of Welding Operators. Intended for such purposes as the quick, economical selection of competent welding operators for other than so-called "code work."

International Acetylene Assn. Training Oxy-Acetylene Welding and Cutting Operators, Instructor's Outlines—including Outline Course for Inspectors. Presents in outline form a series of self-contained lessons for training welding and cutting operators and inspectors. These lessons have been arranged in the ideal order for presenting a general course in welding, courses in aircraft welding and pipe welding, a general course in cutting, a course for structural steel cutting operators, and a course for inspectors. Suggestions for rearrangement and amplification to plan any type of course are included. Each lesson contains an outline of theory or related material to be covered in lecture, suggested assignments for outside study, recommendations for demonstrations, and practice exercises.

International Acetylene Assn. Welding Codes and Specifications. Resumes of the fusion-welding provisions of various codes and specifications, including the A.S.M.E. Boiler and Unfired Pressure Vessel Code, the A.S.A. Pressure Piping Code, Etc., brought up-to-date and enlarged, due to recent rulings by authoritative bodies permitting increased use of welding and cutting on so-called "code work."

National Board of Boiler and Pressure Vessel Inspectors. Recommended Rules for Repairs by Fusion Welding to Power Boilers and Unfired Pressure Vessels, 1941. Covers general requirements, rules for welding, permissible welded repairs, and appendix.

National Board of Fire Underwriters. Gas Systems for Welding and Cutting, No.51; 1942. Covers the use of all gases used for fusion welding and oxygen cutting; stationary generators, outside housing, inside generator rooms, ventilation, protection from freezing, gas holder, compressor, portable generator, service piping requirements, shop pipe line headers, storage of cylinders, oxygen, calcium carbide, and welding equipment.

National Electrical Manufacturers Assn. Electric Arc-Welding Machine and Electrode Standards, 42-81; 1942. Covers the manufacture, test, and performance of d.c. and a.c. arc-welders. D.c. arc-welding generators and motor-generator sets, a.c. arc-welding equipment, rectifier arc-welding equipment, general auxiliary equipment, temperature tests, efficiency, dielectric tests, manufacturing standards, and definitions.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Gas Systems for Welding and Cutting. Covers acetylene generators-general, stationary acetylene generators, portable acetylene generators, service piping systems for all gases, storage of cylinders, storage of calcium carbide, miscellaneous, and operating procedure.

Resistance Welder Manufacturers Assn. Electrical Standards for Resistance Welding Equipment, 1944. Gives nomenclature and definitions and covers service conditions, duty classification, rating, temperature limitations, measurement of input, dielectrical test, electrical output of resistance welding machines, conversion of resistance welding machines from 60-cycle to 25-cycle operation, and name and rating plates.

Resistance Welder Manufacturers Assn. Seam Welding Electrodes, 1940. Covers seam welding electrodes and replacable resistance welding electrodes. Gives tables covering recommended electrode materials for spot welding similar and dissimilar metals using conventional spot welding methods; classification of comparative alloys; coding system for pointed, dome, flat, and offset standard electrodes; pointed tips with tapered shanks; flat tips with tapered shanks; dome tips with tapered shanks; and offset tips with tapered shanks.

Resistance Welder Manufacturers Assn. Seam Welder Standards, 1944. Gives nomenclature and definitions and covers machine sizes and types of operation, electrical capacities, nominal throat depths, nominal electrode forces, mechanical features, electrical features, and optional features.

Resistance Welder Manufacturers Assn. Spot and Projection Welder Standards, Press Type, 1944. Gives nomenclature and definitions and covers machine sizes and types of operation, electrical capacities, nominal throat depths, nominal electrode forces, mechanical features, electrical features, and optional features.

Resistance Welder Manufacturers Assn. Spot Welder Standards, Horn Type, 1944. Gives nomenclature and definitions and covers machine sizes and types of operation, electrical capacities, nominal throat depths, nominal electrode forces, mechanical features, electrical features, and optional features.

Resistance Welder Manufacturers Assn. Stored Energy Welder Standards, 1944. Gives nomenclature and definitions and covers machine sizes and types of operation, welding capacities, nominal throat depths, mechanical features, electrical features, and optional features.

Resistance Welder Manufacturers Assn. Upset-Butt and Flash-Butt Welder Standards, 1944. Gives nomenclature and definitions and covers machine sizes, electrical capacities, nominal upset forces, mechanical features, electrical features, and optional features for upset-butt welders and flash-butt welders.

Underwriters' Laboratories, Inc. Standard for Blowpipes or Torches for Welding, Cutting, Heating, Lead Burning, and Soldering, 1928. Covers oxy-acetylene or other oxy-fuel gas torches. Recommends left hand thread on fuel gas fittings, and right hand thread on oxygen fittings as per standard of the International Acetylene Assn. Includes construction of nozzle, and performance tests.

Underwriters' Laboratories, Inc. Standard for Transformer Type Arc-Welding Equipment, 1937. To be employed on power circuits in accordance with National Electrical Code. General, frame and enclosure, corrosion and protection, supply connections, internal wiring, current-carrying parts, electrical insulation, lampholders, switches and control devices, transformers, spacings, grounding, secondary terminals and open-circuit potentials, power input, temperature, overload, endurance, dielectric strength, burnout, rating, marking, and inspection of listed products.

U. S. Gov., Army Air Forces. Specification 20011D, 1944. Welding; Spot, General Specification for.

U. S. Gov., Army Air Forces. Specification 20028-A (1); 1943. Charge; Welding, Portable Equipment Set.

U. S. Gov., Army Air Forces. Specification No.20036, 1944. Welding; Flash, Butt and Pressure Gas, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-38a; 1944. Tests; Aircraft Welding Operators' Certification.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); miscellaneous standardized product threads of American National thread form or American National pipe-thread form; and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 13. Electric Arc Welding Machines.

U. S. Gov., Dept. of Labor, Div. of Labor Standards, Special Bulletin 5; 1941. Control of Welding Hazards in Defense Industries. Covers eye injuries, burns, gases, fumes and smoke, metal fume fever, metal poisonings, control of gases and fumes, use of respirators, oxyacetylene welding and cutting, and summary.

U. S. Gov., Dept. of Labor, Div. of Labor Standards. Standards for the Protection of Workers in Gas and Electric Welding, 1943. Covers gas welding and flame cutting, electric arc welding, resistance welding, eye protection in gas and electric welding, and ventilation and health protection standards for gas and electric arc welding. Issued by permission of the State of New Jersey Dept. of Labor.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 22Yb; 1939. Structural Steel Welding.

U. S. Gov., Navy Dept. General Specifications for Inspection of Materials, 1941, Appendix VII, Welding, Part A, Section A-2, Symbols for Arc, Gas, and Resistance Welding With Instructions for Use, 1941; Appendix VII, Welding, Part D, Section D-1, General Qualifications of Welding Processes, 1938; Appendix VII, Welding, Part E, Section E-1, Qualification Tests for Metal Arc Welders, 1938; Appendix VII, Welding, Part E, Section E-2, Qualification Tests for Gas Welders, 1939; and Appendix VII, Welding, Part G, Section G-1, General Qualification of Equipment, 1938.

U. S. Gov., Navy Dept. Specification 17W1d; 1940. Welding-Sets; Electric, Direct-Current Arc, Variable Voltage.

U. S. Gov., Navy Dept. Specification 41I4b; 1939. Igniters; Oxyacetylene-Torch.

U. S. Gov., Navy Dept. Specification 41T181; 1943. Torches, Welding and Cutting, Hand, for Oxyacetylene and Oxyhydrogen Gases; Torch-Cutting Attachments and Replacement Torch Tips.

U. S. Gov., Navy Dept. Specification 41T25c; 1944. Torches; Oxyacetylene, Oxyhydrogen, Welding, Hand, Aircraft Use.

U. S. Gov., Navy Dept., U. S. Coast Guard, Bureau of Marine Inspection and Navigation. Marine Engineering Regulations and Material Specifications, 1942. Contains specifications and requirements for materials, design, construction, installation, and inspection of boilers, unfired pressure vessels, and appurtenances thereof; also piping, valves, fittings, flanges, safety valves, etc., upon the strength and efficiency of which safety of life is dependent, and are intended for maximum temperatures of 1,000° F. Includes specifications for fusion welding.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Welding Outfits.

U. S. Gov., Treasury Dept., Procurement Div., 542b; 1943. Electrodes; Arc Welding, Iron and Steel. Covers 30 classes showing welding positions, covering or coating and polarity and current of electrodes, tensile strength, yield point, and elongation. Gives requirements for sizes and lengths, material, finish, and details; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-205-2; 1944. Welding; Symbols for.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-205-3; 1944. Welding; Joint Design.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-206-1; 1944. Welding of Constructional Steel; Metal-Arc, Manual or Machine, for Artillery and Small Arms Material, Excluding Submarine Mines and Observation Towers.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-206-11; 1944. Welding of Constructional Steel; Gas, Manual or Machine, for Artillery and Small Arms Material, Excluding Submarine Mines and Observation Towers.

References.—Methods of testing and general requirements for metals, *see* 600.1; steel cylinders for shipment of acetylene gas, *see* 956.1; regulators or reducing valves for cylinders, *see* 607.6; gages for cylinders, *see* 793.2; protective helmets and goggles, *see* 914.5; safety code for protection of eyes, *see* 914.5; steel welding rods and wire, *see* 603.26, 603.41; cast iron welding rods, *see* 611.19; nickel steel welding wire, *see* 622.4; aluminum welding rod, *see* 631.31; brass welding rod, *see* 645.11; manganese bronze welding rod, *see* 647.23; monel welding rod, *see* 654.53.

768. FOUNDRIES AND FOUNDRY MACHINERY

American Foundrymen's Assn. and National Founders' Assn., Joint sponsors. American Standards Assn., B 8-1932. Safety code for the Protection of Industrial Workers in Foundries. To provide safety for life, limb and health, general requirements on construction, upkeep and operation of entrances, floors, pits, galleries, gangways, aisles, foundry equipment, finishing and cleaning machinery, heating and ventilation, protective clothing, and allowable duties of female workers.

American Foundrymen's Assn. Recommended Good Safety Practices for the Protection of Workers in Foundries, 1940. For safe working environment, safeguards, good housekeeping, warning signs, regulations, investigation of accidents, plant layout, and cupola charging equipment, repairing, shields, tap holes, etc. Also for safe material handling, storage, cleaning, finishing, moving of machinery, guarding of power apparatus, metal and wood working machines; and personal protective devices as shoes, leggings, clothing, goggles, masks, etc.; ladders, mixers, heating, electrical equipment, illumination, and first aid.

References.—Refractories for the malleable industry, *see* 534.12; plumbago crucibles, *see* 574; foundry patterns, *see* 429.9; sintering test for foundry sand, *see* 512.10; protective helmets and goggles, *see* 914.5; foundry facings, carbon base, *see* 575.1; silica mold wash, *see* 593; carbon electrodes for electric furnaces, *see* 575.2.

770-779 TEXTILE, SEWING, AND SHOE MACHINERY

770. GENERAL ITEMS

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Launder-Ometer. Standard laundry machine for laboratory washing tests for testing fastness of dyed textile materials. Consists of a heavily constructed copper tank supported on angle iron frame, with a brass and aluminum rotor, operated at a specified speed, rubber or metal abrasive balls, and tank heater.

American Society for Testing Materials, D 76-42; 1942. American Standards Assn., L 15.1-1943. Textile Testing Machines. Descriptive of testing machines generally applicable for the determination of certain physical characteristics of textile materials. Covers breaking strength and elongation testing machines, thickness gage, bursting testers, and twist testers.

American Society for Testing Materials, E 41-42 T; 1942. Tentative Definitions With Procedures Relating To Conditioning and Weathering. Intended to apply to all cases where combinations of atmospheric influences are an essential part of materials testing. Definitions, relative humidity determination, room temperature determination and test in standard laboratory atmosphere.

American Society for Testing Materials, E 42-42 T; 1942. Tentative Recommended Practice for Characteristics of Standard Carbon Arc Accelerated Weathering Unit. The characteristics recommended cover those points of fundamental importance that will provide an acceptable accelerated weathering unit for many purposes, and at the same time permit the development of detailed and specific cycles needed for the obtaining of particular data and falling within the general structure of this recommended practice.

National Safety Council. Safety Code for Textiles. American Standards Assn., L1-1929. Published by U. S. Dept. of Labor, Bureau of Labor Statistics. A standard for safeguarding textile machinery and equipment by concerns operating such machinery and by the manufacturers of textile machinery and equipment; provides for guards and safe operating features for machines and equipment.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R143-39; 1939. Paper Cones and Tubes, for Textile Winding. This recommendation establishes a simplified list of sizes of paper cones and parallel tubes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R152-34; 1934. Basic Dimensions for Cones for Warp and Knitting Yarns and Hole Sizes for Bobbins for Filling Cop Winders. This recommendation establishes basic dimensions for worsted and cotton and worsted warp yarns, and for mercerized and silk hosiery knitting yarns; and hole sizes for various types of bobbins for filling cop winders.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R153-34; 1934. Hole Sizes for Taper Tubes for Filling Cop Winders. This recomendation establishes standard hole sizes for taper tubes made of paper, wood, metal, or other material.

References.—Methods of testing cotton fabrics, *see* 300.4.

771. KNITTING AND LACE-MAKING MACHINERY

References.—Safety code for textile machinery, *see* 770.

772. COTTON-MANUFACTURING MACHINERY

References.—Safety code for textile machinery, *see* 770.

773. WOOL-MANUFACTURING MACHINERY

References.—Safety code for textile machinery, *see* 770.

774. JUTE MACHINERY

References.—Safety code for textile machinery, *see* 770.

775. SEWING MACHINES

U. S. Gov., Joint Army-Navy Specification JAN-E-30; 1944. Extinguisher; Fire, Demountable, Nestable, Four-Gallon, Water Pump Type.

U. S. Gov., Navy Dept. Specification 66M6e; 1943. Machines; Sewing.

U. S. Gov., Treasury Dept., Procurement Div., 318e; 1944. Sewing Machines. Covers seven types—(I) household, foot treadle; (II) household, motor-driven; (III) household, portable, motor-driven, full size head; (IV) household, portable, motor-driven three-quarter size head; (V) medium-heavy-duty, foot treadle, with round bobbin; (VI) medium-heavy-duty, motor-driven, with round bobbin; (VII) medium-heavy-duty, motor driven, high speed, with round bobbin. Gives requirements for material and workmanship, type of stitch, performance, reversible stitching, wood work, motors and control, adjustment, guards, lubrication, tools, belts, and details for each type; methods of inspection and tests; and packing and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 452B; 1942. Tables; Power, Sectional, Sewing. Covers three types—(I) tables arranged for individual motor drive; (II) tables arranged for line shaft; and (III) tables arranged for "safety" drive. Gives requirements for woodwork, shafting, transmitters, motors, treadles, and accessories; methods of sampling and inspection; and packing and marking.

U. S. Gov., Veterans Administration. Specification VA-M-251b; 1941. Sewing machines; Hand and Foot Power.

U. S. Gov., Veterans Administration. Specification VA-M-304c; 1941. Power Sewing Machines, for Use in Hospitals.

U. S. Gov., Veterans Administration. Specification VA-M-319; 1942 to VA-M-326; 1942, inclusive. Power Sewing Machines.

U. S. Gov., Veterans Administration. Specification VA-M-328; 1943. Sewing Machines; Foot Power, for Use in Hospitals.

References.—Safety code for textile machinery, *see* 770

776. SHOE MACHINERY

780-789 INDUSTRIAL PLANT MACHINERY

781. WEIGHING, PACKAGING, BOTTLING, AND MAILING MACHINERY

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 100-1; 1924. Baling of Clothing and Equipage.

References.—Conveyor chains for bottling plant, *see* 766.1.

782. CHEMICAL-PLANT EQUIPMENT, CEMENT PLANT, PULP AND PAPER, AND CLAY-WORKING MACHINERY

National Safety Council, sponsor. American Standards Assn., P1-1936. Safety Code for Paper and Pulp Mills. Safety rules covering unloading and storage of pulp wood, guarding of saws, hand barkers, barking drums, etc., guards and safe operation in rag and old paper preparation, acid making, chemical processes of making pulp, preparing pulp for paper machine, machine room, and finishing room.

783. GLASS-FACTORY EQUIPMENT, PAINT MACHINERY, BREWERS MACHINERY, RUBBER-MILL MACHINERY

National Safety Council. Joint sponsor with International Assn. of Industrial Accident Boards and Commissions. American Standards Assn., B28a-1927. Safety Code for Rubber Mills and Calenders. Requirements on installation of safety-trip controls and quick-stop facilities, determination of distance of travel of rolls, limits on stopping distances. Published by U. S. Gov., Dept. of Labor, Bureau of Labor Statistics, Bulletin 447.

784. WOODWORKING MACHINERY

784.0 GENERAL ITEMS

National Conservation Bureau, joint sponsor with International Assn. of Industrial Accident Boards and Commissions. American Standards Assn., 01.1-1944. Safety Code for Woodworking Machinery. Intended as a guide for the safe installation, operation, and maintenance of woodworking machinery, including cooperage operations and the making of veneer. Covers general requirements, plant layout, machines and equipment, woodworking machinery, veneer machinery, cooperage machinery, operating rules, appendix, and illustrations.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.5-1942. Code for the Prevention of Dust Explosions in Wood-working Plants. Covers hazards involved by production of finely divided wood particles in the course of woodworking operations; regulations for construction, ventilation, woodwaste collecting equipment, woodwaste disposal, housekeeping, electrical equipment and wiring, and fire protection.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H5; 1923. American Standards Assn. B13-1924. American Logging and Sawmill Safety Code. Requirements on structural features, provision of guards, and rules of operation and procedure, which increase safety for employees, covering felling and logging, sawmill operations, sawmill machinery, and yard operations.

U. S. Gov., Dept. of Labor, Div. of Labor Standards. Special Bulletin 7; 1942. Suggested Standards for Industrial Safeguards. Includes woodworking machinery. Covers band re-saw, band saw or band knife, circular re-saw, circular rip saw, disc sander, drum sander, jointer, mortising machines, moulder, post sander, shaper, swing cut-off saw, and tenoner.

784.1 WOODWORKING MACHINERY

U. S. Gov., Navy Dept. Specification 40S4d; 1944. Shaper-Planers; Motor-Driven, Openside, Shipboard Use.

U. S. Gov., Navy Dept. Specification 40T6b; 1935. Tools; Woodworking, Shipboard Use.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Machines; Woodworking, for Garages.

U. S. Gov., Veterans Administration. Specification VA-M-82d; 1936. Combination Woodworking Machine.

U. S. Gov., Veterans Administration. Specification VA-M-225a; 1936. Lathe; Wood Turning, Belt Driven.

U. S. Gov., Veterans Administration. Specification VA-M-228c; 1941. Mortiser.

U. S. Gov., Veterans Administration. Specification VA-M-298; 1938. Overhead Arm Type Woodworking Machine.

U. S. Gov., Veterans Administration. Specification VA-MC-314, 1941. Machines; Woodworking, Overhead Arm Type, Electric Driven Motor.

U. S. Gov., Veterans Administration. Specification VA-MM-98a; 1939. Woodturning Lathe.

U. S. Gov., Veterans Administration. Specification VA-MM-189b; 1940. Portable Bench Sander; Dustless Belt Type.

U. S. Gov., Veterans Administration. Specification VA-MM-240e; 1941. Saw; Band.

U. S. Gov., Veterans Administration. Specification VA-MM-244f; 1941. Saw; Universal, Portable, With Stand.

U. S. Gov., Veterans Administration. Specification VA-MM-261c; 1940. Jointer; Portable, 8 Inch.

U. S. Gov., Veterans Administration. Specification VA-MM-287a; 1940. Shaper; Woodworking.

785. REFRIGERATING, ICE MAKING, AND ICE-CREAM MACHINERY

785.0 GENERAL ITEMS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Refrigerating Machinery and Insulating of Cargo Space. Include requirements for construction, hydrostatic tests, cooling tests, coils and pipe joints, brine circulation, water circulation, and air circulation.

American Society of Mechanical Engineers. Power Test Code. Refrigerating Systems, 1927. For use in the determination of the performance of compression systems in which compressors of the reciprocating type are used, as well as absorption machines. With auxiliary sections on general considerations, pressure measurement, temperature measurement, electrical measurements, measurement of time, speed measurements, linear measurements, measurement of surface areas, density determinations, humidity determinations, and leakage measurement.

American Society of Refrigerating Engineers. Circular 14; 1941. Standard Method of Rating and Testing Mechanical Condensing Units. Includes definitions, standard test methods, types of capacity measuring apparatus, data to be recorded, and description of eight test methods.

American Society of Refrigerating Engineers. Circular 17; 1939. Standard Method of Rating and Testing Refrigerant Expansion Valves. Includes methods of rating and testing thermostatic and automatic expansion valves.

American Society of Refrigerating Engineers. Circular 18; 1940. Standard Methods of Rating and Testing Self-Contained Mechanically Refrigerated Drinking Water Coolers. Includes definitions, testing, procedure, and test data.

American Society of Refrigerating Engineers. Circular 19; 1940. Standard Water Content Limits for Refrigerating System Parts. To establish the maximum permissible water content of sealed refrigerant system tubing and cooling coils. Includes dehydration of refrigerant system, sealing of refrigerant system, maximum permissible water content of refrigerant system, and method for determining moisture content including equipment and chemicals, preparation of tubing and coils to be tested, and procedure for determining the moisture content.

American Society of Refrigerating Engineers. Circular 20. Standard Methods of Rating and Testing Evaporative Condensers. Includes scope and purposes, classification, method of rating, standard test methods, instruments, apparatus, test procedure, and definitions.

American Society of Refrigerating Engineers. Circular 21-41; 1941. Proposed Methods of Rating and Testing Complete Can-Type Milk Coolers. Includes purpose, definitions, values to be determined under specified conditions, rating tests, calculation of test reports, general data to be recorded, test report, and published capacity data.

American Society of Refrigerating Engineers. Circular 22. Proposed Standard Methods of Rating and Testing Water-Cooled Refrigerant Condensers. Includes purpose, classification, and definition of terms; ratings, test methods; instruments, apparatus, and tables of physical properties; and test procedure.

American Society of Refrigerating Engineers. Circular 23. Proposed Standard Methods of Rating and Testing Refrigerant Compressors. Includes definition of terms and establishes eight operating conditions for standard rating purposes to include all refrigerant condensors, whether belt-driven or direct connected.

American Society of Refrigerating Engineers. Circular 24. Proposed Standard Methods of Rating and Testing Water and Brine Coolers. Includes purpose, classification, and definition of terms; ratings; test methods; instruments, apparatus, and tables of physical properties; and test procedure.

American Society of Refrigerating Engineers. Circular 25. Proposed Standard Methods of Rating and Testing Forced-Circulation Air Coolers for Commercial and Industrial Refrigeration. Includes purpose and definition of terms; and testing-modification of A.S.R.E. standard method.

American Society of Refrigerating Engineers. Joint sponsor with U. S. Bureau of Home Economics. Approved as American Recommended Practice by American Standards Assn., B38c1-1931. Code for Testing Domestic Refrigerators Using Ice. A means for the determination of the performance of domestic iced refrigerators in terms of ice meltage and internal temperatures, under standard conditions of test.

American Society of Refrigerating Engineers, sponsor. American Standards Assn., B9-1939. Circular 15; 1939. Safety Code for Mechanical Refrigeration. Includes definitions, classification of refrigerating systems, restrictions on location, required minimum test pressures, specifications for safety devices and their use, and operating precautions.

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Div., Safety Section. Safety Rules Governing Maintenance of Equipment and Stores Employees, 1942. Gives requirements for prevention of burns (fires, explosions); handling material, tools, and equipment; operation of trucks, tractors, cranes, hoists, and derricks; working on or about machinery, engines, cars; pipe lines, refrigerating or air conditioning units, and elevators; protection against train and engine hazards; and eye protection.

Calcium Chloride Assn. Bulletin 30; 1943. Refrigeration Data With Special Reference to the Use and Properties of Calcium Chloride for Refrigeration Brine. Covers the development and practice of refrigeration, brine for refrigeration systems, initial charges of calcium chloride brine, properties of calcium chloride brines, maintenance of calcium chloride brines, theory of corrosion and use of inhibitors, mechanics of refrigeration, miscellaneous refrigeration data, flow of brine in pipe systems, conversion tables, safety first hints, and blank forms for brine record.

Heat Exchange Institute. Steam Jet Ejector and Vacuum Cooling Section, 1938. This standard includes Part I, Steam Jet Ejectors—covering nomenclature, operating principles, types of assemblies, capacity, and standard accessories and materials of construction; Part II, Test Code for Steam Jet Ejectors—covering purpose of code, scope of code, and illustrations;

and Part III, Steam Jet Vacuum Refrigerator Equipment—covering nomenclature, definitions, performance, construction, standard units, and special types.

Underwirters' Laboratories, Inc. Standard for Air-Conditioning and Commercial Refrigerating Equipment. Covers three systems classified as—class C, containing more than 20 lb. but not more than 100 lb. of refrigerant; class D, containing more than 6 lb. but not more than 20 lb. of refrigerant; and class E, containing 6 lb. or less of refrigerant. Design and construction, examination and test, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Temperature-Indicating and Regulating Equipment, 1942. Covers electrical control equipment for air-conditioning, heating, cooking, and refrigeration, intended to be employed on lighting and power circuits in ordinary locations in accordance with the National Electrical Code. Gives requirements for frame and enclosure, mounting, operating mechanism, corrosion protection, insulating material, supply connections, current-carrying parts, capacities, overcurrent relays, performance, rating, marking, and inspection of listed products.

Underwriters' Laboratories, Inc. Standard for Unit Refrigerating Systems. Covers two systems classified as—class D, containing more than 6 lb. but not more than 20 lb. of refrigerant; and class E, containing 6 lb. or less of refrigerant. Design and construction, examination and test, and inspection of listed product.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS-105-43. Mineral Wool; Loose, Cranulated, or Felted Form, in Low-Temperature Installations. To establish minimum specifications for insulating low-temperature areas with mineral wool, and covers minimum physical and chemical requirements. Covers material, auxiliary material, construction, refrigerated spaces, preparation of surfaces, vapor barrier, floors and ceilings, walls, pipe lines, application, finish, painting, and guarantee.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard (Emergency) CS (E) 107-43. Commercial Electric Refrigeration Condensing Units. To establish minimum standard specifications and methods of test for commercial electric refrigeration condensing units and covers requirements, rating, motor loading, and testing. Covers requirements, condensing units, motors, controls, receiver tanks, shut-off valves, performance standards, production tests, installation, and service instructions.

785.1 REFRIGERATING SYSTEMS

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 1.0; 1941. Ammonia Compressors and Condensing Units. Includes—(1.1) standard nomenclature for reciprocating compressors; (1.2) enclosed ammonia compressors, standard equipment, rotative speeds, and ammonia discharge gas temperatures; (1.3) performance of vertical single-acting ammonia compressors; and standard equipment for ammonia condensing units.

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 2.0; 1941. Ammonia Condensers and Receivers. Includes—(2.1) construction of vertical open shell-and-tube ammonia condensers, (2.2) performance of vertical open shell-and-tube ammonia condensers, (2.3) construction of horizontal closed shell-and-tube ammonia condensers, (2.4) performance of horizontal closed shell-and-tube ammonia condensers, and (2.5) ammonia liquid receivers.

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 3.0; 1941. Ammonia Brine Coolers. Includes—(3.1) construction of horizontal closed ammonia shell-and-tube (flooded) brine coolers, (3.2) performance of horizontal closed ammonia shell-and-tube (flooded) brine coolers, and (3.3) submerged open ammonia brine coolers.

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 4.0; 1941. Miscellaneous Ammonia Standards. Includes—(4.1) location and inspection of data plate on insulated refrigerant containing vessels.

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 4.0; 1941. Miscellaneous Ammonia Standards. Includes—(4.2) ammonia mains. Requirements for the proper size of mains with chart showing the maximum tons of refrigeration normally allowed for certain sizes of pipe, and another chart showing the equivalent feet of pipe for valves and fittings.

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 5.0; 1941. Self-Contained Air Conditioning Units. Includes—(5.1) cooling air conditioning units and (5.2) self-contained room coolers and self-contained room air conditioners.

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 6.0; 1941. Freon-12 Condensers and Receivers. Includes—(6.1) freon-12 evaporative condenser units, (6.2) horizontal closed shell-and-tube freon-12 condensers, and (6.3) freon 12 liquid receivers.

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 7.0; 1941. Miscellaneous Freon-12 Standards. Includes—(7.1) standard equipment for freon-12 condensing units, (7.2) mean temperature difference for freon-12 water coolers, and (7.3) freon-12 mains.

Air Conditioning and Refrigerating Machinery Assn., Inc. Interim Equipment Standards, 1942. Freon-12 Water and Brine Coolers, Forced Air Coolers for Commercial and Industrial Use.

Heat Exchange Institute. Steam Jet Ejector and Vacuum Cooling Section, Standard, 1938. Includes steam jet vacuum refrigeration equipment standards, gives nomenclature for surface condenser and barometric condenser types, construction, performance, standard units, and special types of vacuum cooling units.

National Board of Fire Underwriters. Air Conditioning, Warm Air Heating, Air Cooling, and Ventilating Systems, No. 90; 1942. Standards for the installation of these systems. Part I, for systems other than residences, gives standards applying to air duct systems employing mechanical means for the movement of air and used for heating and ventilating, including warm air heating systems, plain ventilating systems, combination heating and ventilating systems, air cooling systems, and exhaust systems; part II, for systems in residences, gives standards applying to systems such as are used for heating, ventilating, or cooling or any combination of these functions, either with or without a fan.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Refrigeration Safety Code, Safety Code for Mechanical Refrigeration. Covers definitions, building occupancy classification, refrigerating system classification by type, refrigerant classification, institution occupancies, public assembly occupancies, residential occupancies, commercial occupancies, industrial occupancies, installation requirements, refrigerant piping, valves, fittings, design, construction, safety devices, tests, and instructions.

Underwriters' Laboratories, Inc. Standard for Absorption Refrigerating Systems; 1941, Covers refrigerating systems wherein the refrigerant is driven from solution or compound by the application of heat and returned to solution or compound by the absorptive action of the solvent, absorbent, or adsorbent. Covers three systems classified as—class C, containing more than 20 lb. but not more than 100 lb. of refrigerant; class D, containing more than 6 lb. but not more than 20 lb. of refrigerant; and class E, containing 6 lb. or less of refrigerant. Design and construction, gas equipment, kerosene equipment, electrical construction, mechanical construction, examination and test, and inspection of listed product.

Underwriters' Laboratories, Inc. Standard for Unit Refrigerating Systems, 1940. Unit systems of class D and E types containing less than 20 lb. of refrigerant, including household cabinets, ice-cream cabinets, water coolers, and self-contained air-conditioning apparatus. Details as to design, construction, and testing.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-349. Refrigeration Equipment, for Pacific Islands.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS107-45; 1945. Commercial Electric-Refrigeration Condensing Units. Purpose is to establish minimum standard specifications and methods of test and rating for commercial electric-refrigeration condensing units, all applications, for the guidance of manufacturers, distributors, installers, contractors, and users. Covers requirements, rating, motor loading, and testing of air-cooled and water-cooled, belt-driven commercial electric-refrigeration condensing units, in 1/5 to 3 hp. sizes, and water-cooled units of 5 hp. Covers all applications, including air conditioning.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 16Ye; 1941. Refrigerating Equipment. Includes requirements for piping and accessories, and ice making equipment.

U. S. Gov., Navy Dept. Specification 66M10; 1939. Machinery, Ice-Cream, and Equipment, Soda-Fountain; and Installation Thereof, for Airplane Carriers, Battleships, and Cruisers.

U. S. Gov., Veterans Administration. Specification VA-M-134d; 1942. Electric Ice Cream Dispensing Cabinets.

References.—Definitions, testing code, safety code, *see* 785.0, 700; air compressors, *see* 791.2; cast iron, *see* 611.11; shafts and forged steel, *see* 611.52, 611.51; copper tubing for refrigerators, *see* 642.24; household refrigerators, *see* 959.4; synchronous motors for compressors, *see* 711.21.

785.2 ICE-CREAM MOLDS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R120-40; 1940. Ice-Cream-Brick Molds and Cartons. This recommendation establishes standard covering stock dimensions for 2-gal. molds, 1-pt. and 1-qt. machine-filled cartons, and ice-tray pint carton for brick ice cream. Sponsored by the International Assn. of Ice Cream Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R164-36; 1936. Tinned Steel Ice Cream Cans. This recommendation establishes a schedule of stock types, sizes, and capacities of tinned steel ice cream cans of the high type and low (squat) type. Sponsored by the International Assn. of Ice Cream Manufacturers.

786. BAKERY MACHINERY

American Bakers Assn. Recommended Maximum Pan Lengths. For loaves weighing 12, 16, 20, and 24 oz. baked.

American Society of Bakery Engineers. Dump Bins, Blending Bins, and Storage Bins. Bulletin 102; 1935. Gives maximum dumping heights and volume for dump and blending units, volume per 100 lb. of unsifted flour, and of sifted flour for storage bins.

American Society of Bakery Engineers. Flour Hoppers. Bulletin 102; 1935. Gives minimum angle, shape, material, and capacity.

American Society of Bakery Engineers. High Speed Dough Mixers. Bulletin 102; 1935. Includes nine types based on batch capacities of 180 to 1,600 lb., maximum height, minimum ingredient, flour, and water openings, minimum height from floor to lip of tub when fully dumped, jacket opening and water pressure.

American Society of Bakery Engineers. Sifters and Bolting Reels. Bulletin 102; 1935. Gives standard capacities, mesh of screen bolting reel, and mesh of auxiliary sifter.

American Society of Bakery Engineers. Sponge Troughs. Bulletin 115; 1936. Provides for use of 75 percent sponges, dimensional requirements of standard trough for yeast foods, and table of comparative capacities of 6 to 10 ft. lengths giving cubic content and weight of sponge.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 65. Dough Mixers; Large Capacity.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 83. Mixers; Dough, for Food, Light Bread, or Cake.

U. S. Gov., Marine Corps Specification, 1942. Sifter; Flour, for General Use and No. 1 Field Range.

U. S. Gov., Navy Dept.. Specification 64S6a; 1941. Scrapers; Bakery.

U. S. Gov., Navy Dept. Specification 6488a; 1943. Sieves; Flour.

U. S. Gov., Navy Dept. Specification 66M14a; 1943. Machines; Dough-Mixing, Electrically Operated.

U. S. Gov., Treasury Dept., Procurement Div., No.474; 1941. Sieves; Flour. Two types—(I) household size (with crank) and (II) institution size (without crank). Gives general description and requirements for sheet metal, hopper or body, wire cloth, agitator or base, handles, finish, and strength; methods of inspection and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-23; 1937. Table; Moulding, with Legs, Army Field Bake Oven, No.1.

U. S. Gov., U. S. ARMY, Quartermaster Corps. Specification 28-24; 1937. Rack; Bread, Folding No.16-A, Army Field Bake Oven, No.1.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-48; 1937. Trough; Dough, No.15-A, Army Field Bake Oven, No.1.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-31; 1941. Sieve; Flour. There shall be but one type and grade, and sizes shall be as specified. Gives requirements for hardwood, wire cloth; workmanship, construction, sizes, inspection, and methods of tests.

U. S. Gov., Veterans Administration. Specification VA-M-81; 1934. Roll Dividing and Rounding Machines.

U. S. Gov., Veterans Administration. Specification VA-M-128; 1937. Dough Rounder.

U. S. Gov., Veterans Administration. Specification VA-MC-122d; 1942. Loaf Moulder.

U. S. Gov., Veterans Administration. Specification VA-MC-126d; 1942. Flour Handling Outfit.

U. S. Gov., Veterans Administration. Specification VA-MC-127 b; 1942. Dough Divider.

References.—Water tanks for bakery, *see* 956.2.

787. LAUNDRY AND DRY CLEANING MACHINERY AND APPLIANCES

American Gas Assn., American Standards Assn., Z 21.9-1940. Approval Requirements for Hot Plates and Laundry Stoves. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; and appendix, definitions and hose end nozzle.

American Hospital Assn., 46-1. Metal Frame Laundry Basket. Covers one type, one grade, and one class.

American Hospital Assn., 46-7. Electric Flat Irons. Covers two types.

American Hospital Assn., 46-10. Simplified Practice Recommendation Laundry Machinery. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Simplified Practice Recommendations R139-32 Commercial Laundry Extractors, R140-32 Commercial Laundry Flatwork Ironers, R142-32 Commercial Laundry Washers, and R141-32 Commercial Laundry Tumblers.

American Institute of Laundering, International Assn. of Governmental Labor Officials, National Assn. of Mutual Casualty Companies, sponsors. American Standards Assn., Z 8-1924. Safety Code for Laundry Machinery and Operations. Requirements for the provision of interlocks, guards, enclosures, trip bars, etc. for washing machines, extractor, starching, drying, finishing machines, etc., operating rules.

National Board of Fire Underwriters. Dry Cleaning and Dry Dyeing Plants, No.32; 1944. Standards safeguarding processes and plants. Installations shall be arranged in four classes according to the rating of hazards of flammable liquids employed. Gives definitions, general requirements, and detailed requirements for each of the four classes.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Dry Cleaning. Standards for safeguarding cleaning and dyeing plants. Covers definitions, general requirements for two classes based on type of solvent used, location, building, ventilation, lighting, heating, power, tanks, clarifiers, pumps and piping, washers, extractors, etc., brushing and spotting, operating requirements, dry cleaning and dry dyeing, and air conditioning.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R139-32; 1932. Commercial Laundry Extractors. This recommendation establishes as standard extractors of the hand-driven type, either open-type or solid-curb construction. It also sets forth a simplified list of standard diameters of extractors. Sponsored by the Laundry and Cleaners Allied Trades Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R140-32; 1932. Commercial Laundry Flat-Work Ironers. This recommendation sets forth standard diameters and lengths of pad rolls and type of drive for six classes of laundry flat-work ironers. Sponsored by the Laundry and Cleaners Allied Trades Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R141-32; 1932. Commercial Laundry Tumblers. This recommendation establishes a standard list of sizes of reversing and nonreversing tumblers, reversing tumblers (steam only), and semispecial recirculating type. In it are set forth dimensions as to diameters and lengths, number of cylinder doors, number of vertical partitions, and number of compartments for each type. Sponsored by the Laundry and Clean ers Allied Trade Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R142-32; 1932. Commercial Laundry Washers. This recommendation establishes dimensions for various sizes of metal, silk, metal blanket, wood, and wood blanket washers. It also gives details relative to number of compartments, number of vertical and horizontal partitions, number of cylinder doors, and type of drive for each size. Sponsored by the Laundry and Cleaners Allied Trade Assn.

U. S. Gov., Federal Specification 00-L-131c; 1943. Amendment 3; 1944. Laundry Appliances and Wool-Presses (Tailor Shop). Covers marking machines, washing machines, extractors, drying tumblers, laundry presses, flatwork ironers, soap tanks, starch cookers, ironing boards, truck tubs, stationary tubs, seams dampeners, laundry tables, starch tables, etc. Gives general and detail requirements; methods of sampling, inspection, and tests; and requirements for packing and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 78-9; 1939. Basket; Laundry, Metal Frame.

U. S. Gov., U. S. Army, Medical Dept. Specification 78-10; 1939. Outfit; Stamp, Fabric Marking.

U. S. Gov., Veterans Administration. Specification VA-M-186b; 1941. Rug and Carpet Washing Machine.

U. S. Gov., Veterans Administration. Specification VA-MC-76c; 1942. Ironer Canopy.

U. S. Gov., Veterans Administration. Specification VA-MC-133b; 1942. Ironing Forms.

U. S. Gov., Veterans Administration. Specification VA-MC-210a; 1939. Dry Cleaning Presses.

U. S. Gov., Veterans Administration. Specification VA-MC-223d; 1939. Laundry Washers.

U. S. Gov., Veterans Administration. Specification VA-MC-308; 1941. Sheet Folding Machine.

References.—Testing machine for resistance of fabric to laundering, *see* 770; electric motors, electric controllers, starters, *see* 711.2, 714.11; cast iron, malleable cast iron, *see* 611.11, 611.21; steel plates and sheets, *see* 604.1, 604.2; galvanized sheets, *see* 604.32; lumber for tanks and tubs, *see* 413.1; insulating coverings, *see* 707.4; copper sheets, *see* 641.21, 641.23; valves and cocks, *see* 607.6; laundry and starch tables, *see* 613.6; launderometer for testing textiles, *see* 770.

788. TYPESETTING, PRINTING, AND BINDING MACHINERY

International Assn. of Electrotypers and Stereotypers, Inc. A Ratio Unit Value Scale Based on Average Cost of Production, 1941. Gives instructions, quality discount, column chart, tables showing detailed requirements, trade customs, and area chart with scale superseding all previous scales.

International Assn. of Electrotypers and Stereotypers. Engraving, Composition and Lockup Standards for Better Electrotypes, 1941. Covers wax mold electros, black or color, etching depth, backs, zinc halftones, line engravings, vignettes, dead metal, beveling, routing, blocking, and color plates. Requirements for lead molding, composition, foundry lockup, etc.

International Assn. of Electrotypers and Stereotypers. How To Get Better Electrotypes. A primer of electrotyping including making of case, molding, graphiting, electroplating, tinfoiling, casting, etc.

International Assn. of Electrotypers and Stereotypers of America. Standards in Printing Plates, 1930. Includes thickness of unmounted electrotypes, of curved electrotypes, bevel of edges of patent base plates, quality of shell as to toughness and hardness, and formula for electrotype backing metal.

National Assn. of Printers' Roller Manufacturers, Inc. Standard Method of Figuring Weights of Cylinder Press Rollers and Units of Job Press Rollers for Use With Composition Rollers, 1941. A method of determining the difference between job and cylinder rollers. Rollers classed as cylinder rollers are figured on the weight basis, for which a detailed scale is furnished for determining weights. This weight basis is arrived at by the cubic content of a roller, and on the basis that a cubic inch of composition weighs .0468 lb. Rollers classified as job rollers are figured on a unit basis, and this is determined by multiplying the finished face of the roller by the finished diameter. A scale is also furnished giving the number of units each sized roller contains.

Optical Society of America. American Standards Assn., Z 38.7.5-1943. Methods of Testing Printing and Projection Equipment. Covers test for uniformity of contact between negative and positive in printing equipment, measurement of film or slide temperature, and measurement of the uniformity of illumination of the screen.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Printer; Azimuth Circle.

U. S. Gov., Dept. of Labor, Div. of Labor Standards. Special Bulletin 7; 1942. Suggested Standards for Industrial Safeguards. Includes paper and printing Covers job platen press, lacing or fly leafing machines, and paper cutter.

U. S. Gov., Treasury Dept., Procurement Div., 236A; 1942. Machines; Blueprinting, Horizontal Type. Shall be built of metal with a cast iron or steel frame construction. Gives detail requirements as to type, design, illumination, contact, conveyor, feed, speed, control, ventilation, protection, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-38; 1942. Converter M-209-( ); Ciphering Device.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-1; 1940. Binder; Staple, for Print Shop. Pedestal type for foot operation and the grade shall be that specified herein. Gives requirements for materials, workmanship, construction, finish, color, base construction, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-5; 1940. Machine; Linecasting, Typesetting, for Print Shop. There shall be but one type and grade. Gives requirements for materials, workmanship, finish, color, base construction, safety devices, spare parts, details, metal pot, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-7; 1940. Press; Printing, Horizontal or Vertical Bed, for Print Shop. There shall be but one type and grade. Gives requirements for materials, workmanship, finish, color, base construction, safety devices, electrical equipment, spare parts, detail requirements, inspection, and method of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-8; 1940. Presses; Printing, Platen Type, for Print Shop. Type I, size 8 x 12 in.; type II, size 10 x 15 in.; type III, size 12 x 18 in.; type IV, size 14 1/2 x 22 in.; and grade shall be as specified. Gives requirements for materials, workmanship, finish, color, base construction, safety devices, electrical equipment, spare parts, detail requirements, inspection, and methods of tests.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-9; 1940. Press; Proof, for Print Shop. Type I, for bench or table operation (without cabinet); type II same as type I but provided with steel cabinet; and there shall be but one grade. Gives requirements for materials, workmanship, finish, color, safety devices, size, base construction, detail requirements, inspection, and methods of test.

U. S. Gov., Veterans Administration. Specification VA-MC-99b; 1939. Electric Marking Machines.

789. INDUSTRIAL PLANT MACHINERY NOT ELSEWHERE CLASSIFIED

American Foundrymen's Assn. Metal Cleaning Sanitation, 1939. Gives definitions and requirements for cleaning processes including dust and chemical hazards, accident, fire and explosion hazards; alkaline cleaning processes, solutions, handling, heat control, tank construction, handling product, location, and ventilation; solvent cleaning processes, solvent specifications, handling, tank construction, location and ventilation, spraying methods, air drying, and personal protection; solvent degreasing processes, metal pickling processes, tumbling mill, and abrasive blast processes; design, installation, operation, health and safety protection, etc.

Assn. of American Railroads, Operations and Maintenance Dept. Operating-Transportation Div., Safety Section. Safety Rules Governing Maintenance of Equipment and Stores Employes, 1942. Gives requirements for prevention of burns (fires, explosions); handling material, tools, and equipment; operation of trucks, tractors, cranes, hoists, and derricks; working on or about machinery, engines, cars, pipe lines, refrigerating or air conditioning units, and elevators; protection against train and engine hazards; and eye protection.

National Fire Protection Assn.and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.2-1944. Code for the Prevention of Dust Explosions in Starch Factories. Gives general and specific regulations for construction and arrangement of buildings, for kilns, dry starch grinding and grading, pearl and powdered starch bulk packing; lump starch cooking, pressing, grading and packing; control and removal of dust, prevention of ignition, mechanical precautions, and housekeeping.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.3-1942. Code for the Prevention of Dust Explosions in Flour and Feed Mills. Requirements for good housekeeping, construction of buildings, location, equipment, grain driers, removal and control of dust, removal of static dust, electrical equipment, and fire protection.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.4-1942. Code for the Prevention of Dust Explosions in Terminal Grain Elevators. Requirements for construction of buildings, bins and tanks, spacing of buildings, ventilation, mechanical equipment, grain driers, removal of dust from grain handling equipment, removal of static dust, electrical equipment, miscellaneous, and fire protection.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsor. American Standards Assn., Z 12.5-1942. Code for the Prevention of Dust Explosions in Woodworking Plants. Covers hazards involved by production of finely divided wood particles in the course of woodworking operations; regulations for construction, ventilation, woodwaste collecting equipment, woodwaste disposal, housekeeping, electrical equipment and wiring, and fire protection.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.6-1942. Code for Pulverizing Systems for Sugar and Cocoa. Regulations for location, construction, communications, power, lighting, wiring, mechanical precautions, housekeeping, and fire protection.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.7-1942. Code for the Prevention of Dust Explosions in Coal Pneumatic Cleaning Plants. Covers screens, pneumatic jigs or tables, and other machines. Gives requirements for buildings, machines, apparatus, installation, electricity for light, heat and power, and fire and explosion protection.

National Fire Protection Assn. and U. S. Dept, of Agriculture, joint sponsors. American Standards Assn., Z 12.8-1942. Code for the Prevention of Dust Explosions in Wood Flour Manufacturing Establishments. Regulations for location, building construction, communications, electric power, lighting and wiring, preventive measures, housekeeping, and for fire protection.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.9-1942. Code for the Prevention of Dust Ignitions in Spice Grinding Plants. Requirements for location, construction of building, electric power, lighting, wiring, communications, prevention of ignition, housekeeping, and fire protection.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.10-1943. Code for the Use of Inert Gas for Fire and Explosion Prevention. For use of carbon dioxide or other inert gas for preventive purposes, by admixture with air, but not for carbon dioxide fire extinguishing systems. Regulations covering approval of installations, determining amount of inert gas required, table of maximum percentage of oxygen permissible for various materials, sources of inert gas supply, gas conditioning equipment, gas distributing system; analyzing, indicating, and recording apparatus; and test for approval.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.11-1942. Code for the Prevention of Dust Explosion in the Manufacture of Aluminum Bronze Powder. Covers location and buildings, making and conveying of powder, electricity for light and power, control of static electricity, prevention of accumulation of aluminum powder or dust, prevention of ignition of powder, storage of powder, fire fighting methods, and safety provisions.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.12-1943. Code for the Prevention of Sulphur Dust Explosions and Fires. Applies to the crushing, grinding, pulverizing and to certain specific operations in handling of sulphur; and does not apply to mining of sulphur or transportation in common carriers. Covers buildings, electrical equipment, inert gases, conveyors and collectors, prevention of ignition, housekeeping, fire fighting, handling coarse sizes of sulphur in bulk, and sulphur in the liquid or vapor phases.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.13-1943. Code for Prevention of Dust Ignitions in Country Grain Elevators. Covers structural features, equipment, grain driers, removal and control of dust, removal of static dust, electrical equipment, miscellaneous precautions, and fire protection.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.14-1943. Suggested Good Practices for the Application of Suction and Venting for the Control of Dust in Grain Elevators and Storage Units. Covers methods of dust control, suction, venting, application of suction or venting, and inspection traps and velocity control devices.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors. American Standards Assn., Z 12.15-1944. Code for Explosion and Fire Protection in Plants Producing or Handling Magnesium Powder or Dust. Applies to plants producing or handling magnesium powder and in plants producing dust, shavings, or chips in connection with the sawing, grinding, machining, or buffing of castings or stampings made from magnesium or its alloys. Covers location of plants, construction of buildings, making and handling magnesium powder, electrical wiring and equipment, control of static electricity, lighting protection, preventing ignitions of magnesium powder, storage of magnesium powder, fire protection for magnesium powder plants, safety precautions, and collection and disposal of waste dust from grindings, buffing, and similar dust producing operations in the handling of magnesium or magnesium alloy products.

National Fire Protection Assn. and U. S. Dept. of Agriculture, joint sponsors, 1944. Fundamental Principles for the Prevention of Dust Explosions in Industrial Plants. Gives general precautions for building construction, equipment design and installation, housekeeping, sources of ignition, venting, inert gas systems, electrical requirements, static electricity, special precautions for grinders, elevators, conveyors, dust collectors, bins and hoppers, dryers, blowers and exhausters, cooling and refrigeration apparatus, fire prevention and fire extinguishing. (These regulations have been adopted by the National Board of Fire Underwriters).

Underwriters' Laboratories, Inc. Bulletin of Research, 24; 1942. Effectiveness of a Choke for Arresting Starch Explosions in Wood Box Screw Conveyors. Covers description of choke and conveyor; plan of investigation, theory of dust explosions, theory of arrest of explosions by the choke, critical elements of the choke, and test procedure; test record, description of samples, methods of test, and explosion test results; and conclusions.

Underwriters' Laboratories, Inc. Sponsored by National Board of Fire Underwriters. A New Type of Bomb for Investigation of Pressures Developed by Dust Explosions, 1944. Covers abstract, introduction, theoretical considerations, construction details, explosion tests, summary, and references.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 8. Rock Crushers. (A) Crusher only, mounted on steel truck; (B) crusher and power unit mounted on steel truck; (C) crusher, power unit, and bucket elevator mounted on steel truck; and (D) crusher, power unit, bucket elevator, conveyors, storage bin, and screens.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 16. Rock Crushing Plants; Complete Circuit.

U. S. Gov., Navy Dept. Specification 17M12b; 1944. Machines; Armature- and Stator-Coil-Winding, Motor-Driven, Shipboard Use.

U. S. Gov., Navy Dept. Specification 17M13; 1938. Machines; Coil-Winding, Motor-Driven, Shipboard Use.

U. S. Gov., Navy Dept. Specification 40M2a; 1934. Machines; Filing-and-Setting, Band-Saw.

U. S. Gov., Navy Dept. Specification 40M7c; 1944. Machines; Cylinder-Boring, Portable, Motor-Driven, Shipboard Use.

U. S. Gov., Navy Dept. Specification 40R1a; 1923. Machines; Valve-Reseating.

U. S. Gov., Navy Dept. Specification 41M5; 1933. Machines; Sheet-Metal-Working.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Chain Repair Tool.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Clutch Rebuilding Machine.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Creeper; Garage.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Cutter, for Cutting Bead From Tires.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Grinders; Circular Brake Lining.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Spark Plug Cleaner and Tester.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Tester, Armature, Etc.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Tester; Spring.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Tire Changer.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Tire Spreader.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Washer; Car.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Wheel Aligner.

U. S. Gov., Veterans Administration. Specification VA-M-195; 1937. Concrete Block Machine.

U. S. Gov., Veterans Administration. Specification VA-MC-24f; 1941. Washer; Car, High Pressure, Heavy Duty.

References.—Motors and controllers for explosive atmospheres, *see* 711.25, 714.11; blower and exhaust systems, *see* 791.0; coal cleaning plants, *see* 750; pulverizers, coal, *see* 703.9.

790-799 MISCELLANEOUS MACHINERY

791. BLOWERS AND COMPRESSORS

791.0 GENERAL ITEMS

American Foundrymen's Assn. American Standards Assn., Z 43.-1941. Grinding, Polishing, and Buffing Equipment Sanitation. Prescribes the use of exhaust hoods and systems in removing dust, dirt, fumes, and gases generated through the grinding, polishing, and buffing of ferrous and nonferrous metals by means of grinding, polishing, scratch brushing, abrasive cutting-off wheels, grinding and polishing straps and belts.

American Foundrymen's Assn. Design, Construction, Operation, and Maintenance of Exhaust Systems, 1938. For removal of dust, refuse, fumes, and mists for the protection of health, safety, and good housekeeping; definitions and requirements for matter to be handled, enclosed processes, codified hoods, partial enclosures, range and velocity, ventilation, factors affecting air flow, dust collectors, stacks, venturi ejectors, centrifugal and disc fans, fan sizes and power requirements, designing, construction, vacuum cleaning equipment, operation, etc.

American Society of Mechanical Engineers. Joint sponsor with American Society of Safety Engineers, Engineering Section. National Safety Council. American Standards Assn., B19-1938. Safety Code for Compressed Air Machinery and Equipment. Applies to compressed air machinery and equipment, such as air compressors of the positive displacement type (both stationary and portable), air receivers, piping systems, pneumatic hammers, pneumatic drills, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. Not intended to apply to compressed air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

American Society of Mechanical Engineers. Power Test Code. Compressors and Exhausters, 1935. This code provides standard directions for conducting and reporting tests on centrifugal compressors and exhausters. The information is presented as follows—(1) object and scope, (2) enumeration and description of terms, (3) guiding principles, (4) instruments and testing apparatus required and measurement methods, (5) computation of results, (6) form for reporting data and results of tests. In addition, the method of measuring flow with nozzles is explained in detail, and formulas are given for flow measuring nozzles. Diagrams are included to show the nozzle shape applying to all arrangement.

American Society of Mechanical Engineers. Power Test Code. Displacement Compressors, Vacuum Pumps, and Blowers, 1939. Applies to displacement compressors, blowers, vacuum pumps, and all rotary types of machines operated on a positive displacement principle. Important new rules and data relate to measuring the capacity of discharging the output of the compressor to the atmosphere through a low pressure nozzle, nozzle coefficients, maximum allowable variation in operation conditions, capacity calculations and corrections, adjusting test results to reconcile them with operating conditions, etc.

National Board of Fire Underwriters. Blower and Exhaust Systems for Dust, Stock, and Vapor Removal, No. 91; 1937. Regulations cover systems for the removal of flammable vapors, dust, stock, and refuse conveying systems. Includes fans, ducts, ventilation of restaurant type cooking equipment, automatic dampers for duct passages through walls, cyclone collectors, refuse fuel vaults, automatic sprinklers, minimum gauge of metal, etc.

National Fire Protection Assn., proprietary sponsor. Adopted by National Board of Fire Underwriters and published in N.B.F.U. Pamphlets 90 and 91. American Standards Assn., as Z 33.1-1938. Regulations for Air Conditioning and Blower Systems. Includes regulations of the installation of air conditioning, warm air heating or cooling, and ventilating systems in residences and other than residences; of blower and exhaust systems for dust, stock, and vapor removal; and an appendix on maintenance of air conditioning, warm air heating or cooling, and ventilating systems in other than residences.

791.1 FANS AND BLOWERS

American Foundrymen's Assn. Design, Construction, Operation, and Maintenance of Exhaust Systems, 1938. Includes vacuum cleaning equipment for industrial plants, permanent and portable; location of discharge, period of use, air capacity per unit of cloth area and requirements for mole skin cloth, weight and thread count.

National Assn. of Fan Manufacturers. Sound Measurement Test Code for Centrifugal and Axial Fans. Bulletin 104; 1942. For uniform methods of conducting and reporting sound measurement of centrifugal and axial fans. Covers general requirements, room effects, centrifugal fan sound tests, axial fan sound tests, and facsimile of label "certified ratings."

National Assn. of Fan Manufacturers. Standard Methods Adopted for Centrifugal Fans and Blowers. Third Edition, 1942. Supplement A; 1944. Standards for multiblade and nonoverloading fans in 25 sizes. Includes comparison chart for single inlet-single width multiblade and nonoverloading fan; comparison chart for double inlet-double width multiblade and nonoverloading fan; operating limits for class I, II, III, and IV fans; air density ratios at various altitudes and air temperatures; diagrams showing arrangements of drive and designation of direction of rotation and discharge; typical specifications for heating, ventilating, and air conditioning; comparison charts for industrial exhausters (straight bladed wheels) and cast-iron volume fans (straight bladed wheels), motor position, belt or chain drive; abrasion, field test, and performance of fans; standard, air and flue gas densities; and facsimile of label "certified ratings."

National Assn. of Fan Manufacturers. Standard Test Code for Centrifugal and Axial Fans. Bulletin 103; 1941. Covers definitions, centrifugal fan tests, axial fan tests, testing instruments, determinations, observations and calculations, results, test data, nomenclature-symbols, formulae, instructions, description, and operation of typical hook gauge, tables showing weight of saturated and partly saturated air, egg crate straightener, field test of fans, and facsimile of label "certified ratings."

National Assn. of Fan Mfrs. Table 10—Names and Definitions of Types of Fans, 1944. Illustrates and defines propeller fan, tubaxial fan, vaneaxial fan, and centrifugal fan.

U. S. Gov., Army Air Forces. Specification 40741-1; 1944. Blower; Gasoline-Engine-Driven, Type A-2, Portable, Ventilation.

U. S. Gov., Army Air Forces. Specification 40771 (1); 1944. Blower; Gasoline-Engine-Driven, Type A-1.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-59. Fan; Ventilator, Gable.

U. S. Gov., Federal Specification GG-P-606; 1941. Powder-Blowers; Hand. Covers one grade, type, and class. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 17B10c; 1944. Blowers; Electric, for Cleaning and Drying Electrical Equipment.

U. S. Gov., Navy Dept. Specification 17F8; 1929. Fans; Ventilating.

U. S. Gov., Navy Dept. Specification 17F9d; 1944. Fans; Electric, Ventilating, Portable.

U. S. Gov., Navy Dept. Specification 60B1a; 1944. Blowers; Soot, Shipboard Use.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Blowers, 1943. To have free air capacity of not less than 980 cu.ft. per minute at 1,425 r.p.m.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Blowers, 1944. To have free air capacity of not less than 1,550 cu.ft. per minute.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Ventilating Fans, 1944. Portable, 1,000 cu.ft. per minute against 2 in. static pressure.

U. S. Gov., Treasury Dept., Procurement Div., 525a; 1942. Fans; Electric, Air Circulators, Rigid Blades (Not for Marine Service). Covers nonoscillating electric air circulator fans operating on alternating or direct current and intended for use under ordinary office conditions. Gives requirements for sizes, mounting, base, adjustments, blades, guard, motor, cord and plug, finish, and performance; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-126; 1939. Blower; Motor Driven, Direct-Connected.

U. S. Gov., Veterans Administration. Specification VA-MC-307; 1941. Blower; Electric, Portable, Medium Type.

References.—Test codes, *see* 791.0, 700; ventilation systems, *see* 791.0; portable desk and wall fans, *see* 711.23; d.c. motors for ventilating fans, *see* 711.22.

791.2 COMPRESSORS AND SPRAYERS

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 1.0; 1941. Ammonia Compressors and Condensing Units. Includes—(1.1) standard nomenclature for reciprocating compressors; (1.2) enclosed ammonia compressors, standard equipment, rotative speeds, and ammonia discharge gas temperatures; (1.3) performance of vertical single-acting ammonia compressors; and standard equipment for ammonia condensing units.

American Society of Mechanical Engineers. Power Test Code. Compressors and Exhausters, 1935. Besides methods of testing, this code contains information on instruments used, measurements, formulas for flow of air and gas through nozzle, etc.; with auxiliary sections on general considerations, pressure measurement, temperature measurement, head measuring apparatus, electrical measurements, measurement of time, speed measurements, and humidity determinations.

American Society of Mechanical Engineers. Power Test Code. Displacement Compressors, Vacuum Pumps, and Blowers, 1939. Applies to displacement compressors, blowers, vacuum pumps, and all rotary types of machines operated on a positive displacement principle. Important new rules and data relate to measuring the capacity by discharging the output of the compressor to the atmosphere through a low pressure nozzle, nozzle coefficients, maximum allowable variation in operating conditions, capacity calculations and corrections, adjusting test results to reconcile them with operating conditions, etc.; with auxiliary sections on general considerations, pressure measurement, temperature measurement, measurement of time, speed measurements, and linear measurements.

American Society of Refrigerating Engineers. Circular 23. Proposed Standard Methods of Rating and Testing Refrigerant Compressors. Includes definition of terms and establishes eight operating conditions for standard rating purposes to include all refrigerant condensers, whether belt-driven or direct connected.

Compressed Air Institute. Trade Standards, 1938. Gives definitions, nomenclature, rating standards, test standards, data, tables, and formulae. Includes installation, maintenance, uses for reciprocating compressors, vacuum pumps, rotary compressors, blowers, centrifugal compressors, and blowers. Also describes compressor accessories such as receivers, after-coolers, filters, piping, and valves; portable compressors, rock drills, and accessories, and pneumatic tools and accessories.

U. S. Gov., Army Air Forces. Specification No. 40778; 1944. Compressor; Single-Stage, Air, Type A-1, Gasoline Engine Driven, Portable.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 202-43; 1943. Air Compressors for Automotive Service Stations and Garages (Motor-Driven, 1/2 to 10 Horsepower). Proposed by the Pneumatic Automotive Equipment Assn. Covers stock automatic start and stop compressors of air-cooled construction, complete, horizontal-tank mounted, electric-motor-driven, operating above 100 lb. per square inch and up to and including 200 lb. per square inch. Table shows horsepower of motors, type of compressors, and tank capacities.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 85. Air Compressors; Portable.

U. S. Gov., Navy Dept. Specification 57C10; 1941. Compressors; Air, Automatic, With Tank.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Air Compressor, 1943. Electric-motor driven, capacity 85 cu.ft. free air per minute.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Compressor; Air.

U. S. Gov., Treasury Dept., Procurement Div., Specification No. 233. Portable Air-Compressor; Two-Stage. Shall consist of a vertical or V-type, two-stage air-compressor connected to a gasoline engine, properly mounted and connected in a compact manner to allow for quick repairs or adjustments. Gives detail requirements as to compressor, gasoline engine, regulation, air receiver and gasoline tanks, equipment, size, and service requirements.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2945A; 1940. Compressor Unit.

U. S. Gov., Veterans Administration. Specification VA-MC-62g; 1942. Air Compressor; Garage.

U. S. Gov., Veterans Administration. Specification VA-MC-283d; 1942. Air Compressors, Tanks, and Motors.

References.—Test codes, *see* 791.0, 700; compressors for refrigerating machinery, *see* 785.0, 785.1; synchronous motors for compressors, *see* 711.21.

792. HEATING, VENTILATING, AND AIR-CONDITIONING EQUIPMENT

792.0 GENERAL ITEMS

Air Conditioning and Refrigerating Machinery Assn., Inc. Code of Application Engineering Standards for Air Conditioning for Comfort, 1940. Limited to application engineering standards and practices for determining the conditions and the loads for which to design systems for conditioning air for the comfort of persons. Includes design load factors, design outside conditions, design inside conditions, sunlight radiation through glass, design outside air quantity, infiltration, ventilation requirements, design occupancy, heat from appliances, transmission coefficients, total air circulation, air distribution, and capacity specifications.

American Foundrymen's Assn. Design, Construction, Operation, and Maintenance of Exhaust Systems, 1938. Includes theory of air flow in exhaust systems, applications, variable air conditions, resistance, centrifugal and propeller type fans, power requirements, design, construction specifications, charts and tables, testing, and supervision.

American Foundrymen's Assn. Testing and Measuring Air Flow in Exhaust Systems, 36-27; 1937. Covers technique for determining volume and velocity of air flow in foundry exhaust ventillating systems, general types of instruments necessary including pitot tube, manometer gauges, anemometers, swinging vane type velocity meter, illustrations, and charts.

American Society of Bakery Engineers. Standardization of Humidifier Practice in Baking Plants. Bulletin 74; 1932. Gives recommended standards for temperature and relative humidity of fermentation rooms, proof rooms, for air changes and distribution, materials for humidifiers and duct work, and explanatory notes.

American Society of Heating and Ventilating Engineers. Code of Minimum Requirements for Heating and Ventilating Garages, 1935. Includes basement and sub-basement garages, specifies volume of air supply and exhaust, sprinkler system, use of space, ratio of exit area, and prohibits handling of gasoline. Covers heating systems, ventilation, repair work, inspection and repair pits and trestles, and the carbon monoxide hazard.

American Society of Heating and Ventilating Engineers. Heating, Ventilating, Air Conditioning Guide, 1944. Contains a technical data section of reference material on the design and specification of heating, ventilating, and air conditioning systems based on—the transactions, the investigations of the research laboratory and cooperating institutions, and professional practice. Includes principle of thermodynamics of air and water mixtures, physiological principles, heating and load calculations, combustion, steam and hot water heating, air conditioning, automatic controls, instruments, and motors. Also special applications such as drying systems, industrial and transportation air conditioning, etc.

American Society of Heating and Ventilating Engineers. Standard Code for Testing and Rating Air Cleaning Devices Used in General Ventilation Work.

American Society of Heating and Ventilating Engineers. Standard Test Code for Heat Transmission Through Walls, 1928. This code has not been framed for the purpose of offering detailed instructions for testing the heat transmission of building materials, or for constructing testing apparatus, but rather for defining certain standards, the applications of which it is hoped, will bring the results of different investigations into better conformity than is found at the present time. Includes definitions and formulas, conductivity of homogeneous materials, and over-all heat transmission.

American Society of Heating and Ventilating Engineers. Ventilation Standards, 1932. A statement of those requirements which, based on present day knowledge, will provide adequate ventilation for spaces intended for human occupancy. Includes air temperature, humidity, quality, motion, dixtribution, and quantity; definitions; and tables of effective temperatures.

American Society of Refrigerating Engineers. Circular 13; 1936. Standard Method of Rating and Testing Air Conditioning Equipment. Includes scope, classification, ratings, instruments and apparatus, testing cooling equipment, testing heating equipment, testing humidifying equipment, and definitions.

American Society of Refrigerating Engineers. Circular 16; 1940. Standard methods of Rating and Testing Self-Contained Air Conditioning Units for Comfort Cooling. Includes scope and purposes, classification, method of rating, instruments, apparatus, cooling capacity tests, heating capacity tests, humidifying capacity tests, and definitions.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, 1939. Air conditioning requirements including definitions for summer air conditioning, winter air conditioning, and year-round air conditioning; includes humidification, psychrometric chart, heat content tables, mean outdoor temperatures for various cities, heat gain for various appliances, average water main temperatures, refrigeration pipe sizes for various refrigerants, volumes of air required for various ventilation purposes, etc.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, 1939. Covers procedures for figuring radiation (heat losses) for brick, veneered, concrete, tile, stone, stuccoed, cinder block, clapboard frame, wood shingled, and interior walls, floors, openings, roofs, etc., plastered and insulated. Gives tables for exposure and temperature factors in various American cities, and for required inside temperatures on various classes of buildings. Also gives radiation loads for low pressure heating boilers, requirements for chimneys, automatic heating devices, pipe sizes, standard dimensions of valves, fittings, and materials. Also includes air conditioning and humidification.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, Part I. Heat Loss Calculations, 1943. All rules for determining the required amount of radiation necessary to heat properly a given space are based on the heat needed to offset the losses due to the transfer of heat through the walls, windows, floors, ceilings, and roofs, and the additional heat required to bring the air that leaks into that space up to the design temperature. Gives conductivities and coefficients of transmission for various types of masonry, insulation, building boards, roofing construction, plastering materials, and frame building construction; covers infiltration and inside temperatures usually required; and gives data on radiation estimating.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, Part III. Pipe Sizes and Design, 1945. This information, it is anticipated, will provide engineers and contractors with a standard method for selecting pipe sizes for steam heating systems that will result in the design of plants that are scientifically correct. Gives data and tables covering flow of steam in pipes, capacities and velocities, conversion data, and various steam systems, vapor systems, and vacuum pump systems; piping details; tables covering gravity hot water pipe sizes; details of gravity hot water systems; tables covering mechanically circulated hot water pipe sizes and details; and tank sizes and valve tappings.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, part IV. Comfort Air Conditioning, 1944. This section is not intended to be applied to industrial air conditioning. Covers psychrometric definitions, psychrometric properties of air, heat content of air and water vapor, winter inside dry-bulb temperatures usually specified, desirable inside conditions in summer corresponding to outside temperatures, design conditions, heat of persons, heat gain from various sources, ventilation standards, infiltration through windows, solar heat gain through roofs and walls, temperature differentials for shaded surfaces, infiltration through doors, sunlight radiation through glass, maximum permissible relative humidities, temperature of city water during summer season (over 100,000), heat due to fan horsepower, heat due to pump horsepower, and appendix.

Heating, Piping, and Air Conditioning Contractors National Assn. Engineering Standards, Part V; 1945. Graphic Symbols for Use on Drawings and Scheme for the Identification of Piping Systems. Contains two sections. The first gives graphical symbols for use on drawings; and the second, methods of identifying piping systems.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 3, Part 1; 1942. Air Flow Measurement by the Dilution Method. This method is capable of measuring the rate of air flow in a complex system which has multiple air inlets and outlets. Discusses the method and gives accuracy and application.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 3, Part 2; 1942. Measuring Air Flow in Industrial Ventilation. Covers air flow and static suction, technique of measurement, hood entry coefficient, examples, exhaust from chambers, velocity pressure measurements, pitot tube, pitot tube accessories, air flow through ventilation openings, checking, velocity at point in space, and gives tables showing related data.

Industrial Unit Heater Assn. Standard Code for Testing Hot Water Unit Heaters, 1942. Gives definitions, rating, standard basis of rating, outline of tests, equipment for testing, test procedure, computation of results, addenda giving standard code for testing and rating steam unit heaters.

National Board of Fire Underwriters. Air Conditioning, Warm Air Heating, Air Cooling, and Ventilating Systems, No.90; 1942. Standards for the installation of these systems. Part I, for systems other than residences, gives standards applying to air duct systems employing mechanical means for the movement of air and used for heating and ventilating, including warm air heating systems, plain ventilating systems, combination heating and ventilating systems, air cooling systems, and exhaust systems; Part II, for systems in residences, gives standards applying to systems such as are used for heating, ventilating or cooling, or any combination of these functions, either with or without a fan.

National District Heating Assn. Handbook, 1932. Provides an authoritative and complete manual of practice for the use of those engaged in district heating work.

National Warm Air Heating and Air Conditioning Assn. A Yardstick for the Evaluation of a Forced Warm Air Heating System, 1941. Covers three classes—(A) excellent practice, (B) good practice, and (C) poor practice. This booklet attempts to explain for the benefit of the home owner what constitutes a good forced warm air heating system, what specifications he and the architect should have for a class A or a class B installation, and what features a heating contractor can offer in accordance with the best modern practice.

National Warm Air Heating and Air Conditioning Assn. Standard Code Application Manual for Gravity Warm Air Heating Systems, 1941. The Manual shows recommended sizes, B.t.u. ratings, and suggested installational procedure. The purpose of the recommendations and tables included is to simplify the selection of the equipment in the design of gravity warm-air heating systems. The manual includes a method to estimate heat losses and illustrations.

National Warm Air Heating and Air Conditioning Assn. The Practical Code for the Design and Installation of Mechanical Warm Air Heating Systems, 1942. For average installations up to 100,000 B.t.u. at the register and 2,000 C.f.m. with register air temperature 110° to 150°. These rules are submitted with the idea of expressing their provisions in such form that they may be understood and applied by anyone. Not intended for application to large or unusual institutions.

National Warm Air Heating and Air Conditioning Assn. The Standard Gravity Code for the Design and Installation of Gravity Warm Air Heating Systems, 1940. A set of rules to govern the proper design and installation of gravity warm air heating systems subject to the limitations. Consists essentially of a furnace with casing and smoke pipe, together with a properly designed system of heating pipes and outlets, known as registers; also air ducts to convey the return air to the furnace.

National Warm Air Heating and Air Conditioning Assn. The Technical Code for the Design and Installation of Mechanical Warm Air Heating Systems, 1942. This code is formulated to provide reliable methods of design and installation of mechanical warm air heating systems for the protection of the buying public. It covers fundamental data and rules which of necessity must be observed. In all cases, however, experience is necessary to obtain full value of its application. This code does not attempt to provide the application of all variables found in practice.

Underwriters' Laboratories, Inc. Bulletin of Research, 27; 1943. Clearances and Insulation of Heating Appliances. This bulletin describes tests conducted to provide definite technical information as a basis for promoting uniformity in the various ordinances, regulations, and standards bearing on the subject. Covers mechanism of heat transfer, test equipment, tests of protective assemblies, temperature measurements, test procedure, test results, and comments.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS54; 1940. Effect of Soot on the Rating of an Oil-Fired Heating Boiler. It is shown that the rating of a boiler, obtained by a test method based on constant flue—gas temperature, can be seriously affected by soot on the heating surfaces, although the soot may be too slight in amount to affect greatly either the capacity or the efficiency at a constant firing rate. At constant firing rate the soot has a large effect on the flue-gas temperature.

U. S. Gov., Dept. of Labor, Div. of Labor Standards. Special Bulletin 3; 1941. Protecting Plant Manpower. Practical Points on Industrial Sanitation and Hygiene. Covers introduction, fatique, criteria of industrial health hazards, preventive measures, heating, ventilation, and cooling of work places, personal respiratory protection, personal service conveniences, industrial health program for the small plant, illumination, and noise.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 21Yc; 1940. Installation of Power-Plant, Heating, and Ventilating Apparatus and Piping.

792.1 HEATING EQUIPMENT

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes: Hot Water Heating System, Two-Pipe Gravity; Steam Heating System, One-Pipe Gravity; Steam Heating System, Two-Pipe Gravity; Hot Air Heating; and Hot Blast Heating System. Gives requirements for the various equipments and items involved and the installation of same.

American Society of Heating and Ventilating Engineers. Code for Testing and Rating Return Line Low Vacuum Heating Pumps, 1934. Provides a standard method of testing and rating the air and water capacity of vacuum heating pumps under specified conditions. Definitions, basis of rating, method of test, test procedure, diagram of test set-up, and specimen test calculation.

American Society of Heating and Ventilating Engineers, and Industrial Unit Heater Assn. Standard Code for Testing and Rating Steam Unit Heaters, 1930. Prepared jointly by the two organizations. Covers definitions, basis of rating, test procedure, equipment necessary, computations of results, and diagrams of test set-ups.

Underwriters' Laboratories, Inc. Standard for Temperature-Indicating and Regulating Equipment, 1942. Covers electrical control equipment for air-conditioning, heating, cooking, and refrigeration, intended to be employed on lighting and power circuits in ordinary locations in accordance with the National Electrical Code. Gives requirements for frame and enclosure, mounting, operating mechanism, corrosion protection, insulating material, supply connections, current-carrying parts, capacities, overcurrent relays, performance, rating, marking, and inspection of listed products.

U. S. Gov., Navy Dept Bureau of Yards and Docks. Specification 36Y; 1942. Forced-Circulation Hot-Water Heating Systems.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 37Y; 1942. Steam-Heating and Ventilating Systems.

U. S. Gov., Navy Dept. Specification 45S1; 1939. Strainers; Steam, for Small Branch Steam Lines.

U. S. Gov., Navy Dept. Specification 66P1a; 1937. Power-Plant, Heating, and Ventilating Apparatus and Piping; Shore Use.

References.—Heating systems, heat transmission tests, *see* 792.0; electric heaters, *see* 717.1; house heating boilers and radiators, *see* 614.0, 614.4; heating equipment for power and heating boilers, *see* 703.9; sheet iron and steel, *see* 604.2, 604.3; fans and blowers, *see* 791.1; gas and gas appliances, *see* 997.2; gasoline vapor machines and systems, *see* 997.4; acetylene equipment for heating, *see* 997.5; power test code, *see* 700.

792.2 VENTILATING EQUIPMENT

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 5.0; 1941. Self-Contained Air Conditioning Units. Includes—(5.1) cooling air conditioning units, and (5.2) self-contained room coolers and self-contained room air conditioners.

American Society of Heating and Ventilating Engineers. Code of Minimum Requirements for Comfort Air Conditioning, 1938. Provides a uniform procedure and methods for use in establishing the fundamental basis for the design of comfort air conditioning installations in the U. S. and Canada. The requirements herein set forth are intended to serve as minimum design requirements, and are not to be construed as limiting good practice nor preventing progress in the art of air conditioning. These requirements are intended to be applied only to systems provided with mechanical circulation of the air. Includes definitions and abbreviations, design temperatures and relative humidities, design load estimates, source for heat transfer, infiltration and ventilation rates, air distribution, apparatus rating, requirements for the selection of refrigerating equipment, noise control, and guarantees and exceptions.

American Society of Heating and Ventilating Engineers. Standard Code for Testing and Rating Steam Unit Ventilators, 1932. Provides a method of testing and rating the heat and air output of steam unit ventilators. Includes definitions, basis of rating, outline of tests, equipment for testing, test procedure, and computation of results. Adopted by the Industrial Unit Heater Assn.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 2, Part 4; 1938. Design of Exhaust Hoods. Covers suction and velocity requirements for hoods, table showing minimum air velocities required to capture certain industrial dusts, table showing minimum air velocities required to capture certain foundry dusts, protection against corrosion, and table showing materials to be used for the protection of exhaust systems against corrosion.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 2, Part 5; 1938. Design of Duct Work for Exhaust Systems. Covers duct sizes, method of determining pressure drop in ducts, conveying capacity of ducts, construction, and codes.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 10Yc; 1938. Metal Windows. Includes requirements for manual and electric-motor-operated ventilating sash operators.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 37Y; 1942. Steam-Heating and Ventilating Systems.

U. S. Gov., Navy Dept. Specification 66D2; 1942. Dehumidifiers; Silica-Gel, Portable Type.

U. S. Gov., Navy Dept. Specification 66P1a; 1937. Power-Plant, Heating, and Ventilating Apparatus and Piping; Shore Use.

References.—Ventilation systems, *see* 792.0; safety code for coal mine ventilation, *see* 751; blowers and fans, *see* 791.1, 791.0; sheet iron and steel, *see* 604.2, 604.3.

792.3 AIR-CONDITIONING EQUIPMENT

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 6.0; 1941. Freon-12 Condensers and Receivers. Includes—(6.1) freon-12 evaporative condenser units, (6.2) horizontal closed shell-and-tube freon-12 condensers, and (6.3) freon-12 liquid receivers.

Air Conditioning and Refrigerating Machinery Assn., Inc. Equipment Standards, 7.0; 1941. Miscellaneous Freon-12 Standards. Includes—(7.1) standard equipment for freon-12 condensing units, (7.2) mean temperature difference for freon-12 water coolers, and (7.3) freon-12 mains.

Assn. of American Railroads, Mechanical Div., Electrical Section. Manual of Standard and Recommended Practice, 1940. Car Air-Conditioning Equipment. For railway passenger service. Gives methods of inspection and maintenance of steam ejector, water-ice, compressor, direct mechanical, ice-engine, and liquefied propane gas system, types of air-conditioning equipment at maintaining terminals; includes battery, traps, pumps, filters, fans, controls, lubrication, etc.

Underwriters' Laboratories, Inc. Standard for Air-Conditioning and Commercial Refrigerating Equipment, 1940. Covers classes C, D, and E systems containing less than 100 lb. of refrigerant. Design and construction requirements, wiring, motor, controls, refrigerant, fittings, etc.

U. S. Gov., Army Air Forces. Specification 40742-3; 1944. Cooler; Portable, Airborne Air, Type A-1, Gasoline Engine Driven.

U. S. Gov., Army Air Forces. Specification 40871; 1944. Cooler; Stationary Air, Type B-1.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS107-45; 1945. Commercial Electric-Refrigeration Condensing Units. Purpose is to establish minimum standard specifications and methods of test and rating for commercial electric-refrigeration condensing units, all applications, for the guidance of manufacturers, distributors, installers, contractors, and users. Covers requirements, rating, motor loading, and testing of air-cooled and water-cooled, belt-driven commercial electric-refrigeration condensing units, in 1/5 to 3 hp. sizes, and water-cooled units of 5 hp. Covers all applications, including air conditioning.

U. S. Gov., Federal Specification OO-A-361; 1938. Air-Conditioning Units (Room-Coolers); Electric-Motor Driven, Portable. Covers air-cooled and water-cooled types. Gives requirements for design and construction, cabinet and ducts cooling capacity, ventilation, filters, control, refrigerant, noise, etc.; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

793. MEASURING AND RECORDING APPARATUS

793.0 GENERAL ITEMS

American Society of Mechanical Engineers. Flow Measurement, 1940. Presents procedures for the use of flow nozzle and orifice plates in the measurement of the volume of fluids of various kinds. Covers introduction, letter symbols, equations and definitions, recommended technique, primary elements, giving the tolerances for flow measurements by means of nozzles and orifice plates, computations and examples, and derivations of equations.

American Society of Mechanical Engineers. Fluid Meters—Their Theory, Application, Selection, Description, and Installation, 1937. Covers theory and application including design, coefficients, general behavior, gives reliable information on the various types of fluid meters, and describes in detail the various methods of measurement; description of meters presents a brief description of the individual makes of meters which are in commercial manufacture; and selection and installation gives dependable information on the selection of a meter for a particular use and the proper installation of the various types of meters.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 1—General Considerations, 1935. The instruments and apparatus here considered are those used for measuring physical and chemical quantities in connection with tests of power equipment.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 5, Chapter 4—Flow Measurement by Means of Standardized Nozzles and Orifice Plates, 1940. Contents described on page 12 under title of Flow Measurement.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 13—Speed Measurements, 1939. Describes and classifies speed; deals with precautions to be observed in taking readings; discusses calibration and its need in order to determine the instrument errors. Counter and timepiece methods are defined. The operating principles of the various types of tachometers are described, and the factors affecting their accuracy are given. The methods by which a tachometer drive may be obtained are outlined, as well as the stroboscopic method of measuring rotative speed.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 14—Linear Measurements, 1936. Contains concise information on calipers, dividers, tapes, rules, scales, micrometers, etc.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 15—Measurement of Surface Areas, 1944. Describes and illustrates polar and radial planimeters, and discusses their use in measuring surface areas.

American Society of Mechanical Engineers. Report on Orifice Coefficients, 1936. Joint A.G.A.—A.S.M.E. recommendations for the construction and installation of pipe orifices. Covers history, various researches conducted, analysis of data available, recommendations on the proper methods of constructing and installing concentric orifices, precautions and accuracy to be expected, information on effect of pulsating flow on measurements by an orifice, and tables and curves of orifice coefficients.

Natural Gasoline Assn. of America. Tentative Standard Method for Calculation of High Pressure Gas Measurement.

Underwriters' Laboratories, Inc. Standard for Temperature-Indicating and Regulating Equipment, 1942. Covers electrical control equipment for air-conditioning, heating, cooking, and refrigeration, intended to be employed on lighting and power circuits in ordinary locations in accordance with the National Electrical Code. Gives requirements for frame and enclosure, mounting, operating mechanism, corrosion protection, insulating material, supply connections, current-carrying parts, capacities, overcurrent relays, performance, rating, marking, and inspection of listed products.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H26; 1941. Weights and Measures Administration. Presents a general discussion of weights and measures supervisory work, as this should be carried on by state and local regulatory officers. Beginning with a statement of the functions of the weights and measures officials and a tabulation of the present organization of weights and measures administration in the U. S. Part I of the text proceeds to a consideration of a model form of weights and measures organization, fee and licensing systems, essential elements of the law, the training of officials, and other general subjects. Part II deals with those activities of the official which have to do with scales, weights, measures, etc., treating separately such topics as standards and equipment, and the testing, sealing rejection, adjustment, and repair of commercial equipment. The supervisory side of weights and measures administration, as distinguished from the mechanical side, is discussed in part III; the education of the users of commercial equipment and of the public, try-out inspections, the investigation of complaints, and prosecutions are among the subjects treated. Part IV is devoted to systems of weights and measures records. Three appendixes are included, the first presenting Federal weights and measures laws and regulations, the second giving the full texts of the three forms of the Model State Law on Weights and Measures, and the last listing the specific items of standards and equipment recommended for state and local departments of weights and measures. The handbook has been prepared to provide basic information for weights and measures officials, to encourage the extension of weights and measures supervision to communities not now enjoying that protection by providing the facts for the study of the subject by consumer groups and others, and to supply data for the enactment of laws and the establishment of adequate regulatory agencies in the weights and measures field.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. The specifications and tolerances given in this handbook are intended to apply to weights and measures and weighing and measuring devices used in commercial transactions which have been adopted by the National Conference on Weights and Measures.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, Handbook H37; 1945. Testing of Weighing Equipment. A manual for state and local weights and measures officials, describing various types of commercial weighing equipment, the principles of their operation, and methods for their inspection and test. Covers basic principles, basic elements, automatic weight indication, types of ordinary scales, types of special scales, elements of scale performance, inspection of commercial scales, testing of commercial scales, weights used with commercial scales, and appendices.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M121; 1936. Units of Weight and Measure Definitions and Tables of Equivalents.

793.1 COUNTERS, TAXIMETERS, SPEEDOMETERS

Society of Automotive Engineers. 1944 Handbook, Section 2—Units, Parts, and Fittings. S.A.E. Recommended Practice for Speedometers, adopted 1939. For use as the basis for speedometer drive gear computation and compensation for errors; for speedometer performance and identification; and for flexible shaft-end construction. It differentiates between the drives intended for marine, medium, and heavy duty motor truck, motorcoach, and tractor installations and those for passenger cars and light trucks.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specification, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Odometers. Refers to a machine designed to be attached permanently to a vehicle and adapted automatically to register the distance traversed by the vehicle. Includes detail requirements and tolerances, to include also hub odometers, cable-driven odometers, and the mileage-recording, or odometer, portions of the so-called "speedometer" assemblies for automobiles.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Taximeters. Refers to a machine adapted automatically to calculate, at a predetermined rate or rates, and to register the charge for hire of a vehicle. Detail requirements are given covering construction, operation of taximeters, and tolerances.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 17-135; 1921. Counter; Hand Tally.

793.2 GAGES, EXCEPT DIMENSION GAGES

American Foundrymen's Assn. Testing and Measuring Air Flow in Exhaust Systems, 36-27; 1937. Includes instruments for measuring air flow in pipes such as pitot tubes, inclined and vertical manometer gages; for air flow into hoods and enclosures, as—revolving vane type anemometers, and swinging vane type direct reading velocity meters. Also method of use, illustrations, and graphs.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Steel, Iron, Brick, and Reinforced Concrete Chimneys. Gives requirements for draft gages.

American Society of Mechanical Engineers. Indicating Pressure and Vacuum Gages. American Standards Assn., B40.1-1939. Applies to round, dial type indicating gages utilizing an elastic chamber for confining the pressure medium. Tables give gage sizes and dimensions, dial ranges, grades of accuracy, and values of graduations. Rules cover indicating pointer, installation, and use of gages; mounting holes; stop pins; location, type, and size of pressure connections; accuracy requirements, and testing to determine the accuracy of gage.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 2—Pressure Measurement, Chapter 4; 1938. Instruments here described in considerable detail include Bourdon, Bellows, Diaphragm, and Deadweight Gages.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 2—Pressure Measurement, Chapter 5, Liquid Column Gages, 1942. Describes and illustrates the various types of liquid column gages; provides installation rules; points out precautions to be observed; and includes calibration instructions.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 4—Head Measuring Apparatus, 1933. Apparatus described includes float gage, flat plate and rod gage, water column, hook gage, stilling box, dial pressure gage, and manometers.

Underwriters' Laboratories, Inc. Standard for High Pressure Gas Gauges, 1930. For high pressure containers of gases used in welding and cutting, internal explosion test requirements, accuracy of indication on original calibration, and after overpressure test, impulse test, vibration test, marking, and size of dial.

Underwriters' Laboratories, Inc. Standard for Nonrecording Spring-Pressure Gages, Section III, Subject 393; 1921. Includes general requirements for pressure-indicating gages. Gives design and construction, practicability, durability, strength, reliability of operation, accident hazard, and uniformity.

U. S. Gov., Army Air Forces. Specification No.27487; 1944. Gage; Emergency, Oxygen, Type L-2.

U. S. Gov., Army Air Forces. Specification 27546-1; 1944. Gage; Pressure, Type O-1, Aircraft, General Purpose.

U. S. Gov., Army Air Forces. Specification 40781-A-1; 1945. Regulator; Oxygen Pressure, Type C-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-9-2; 1944. Gages; Manifold Pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-12; 1943. Gages; High Pressure Oxygen.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-13a; 1944. Gages; Low Pressure Oxygen.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-17a-1; 1944. Gage Units; Engine, With Capillary Thermometer.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-18a-1; 1944. Gage Units; Engine, With Electric Thermometer.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-19-2; 1944. Gages; General Specification for Fuel and Oil Quantity.

U. S. Gov., Federal Specification GG-G-66; 1935. Gages; Pressure (for) Direct Stem-Mounting. Covers four types of stem or socket mounted indicating gages—(I) lubricating-oil pressure (range 0 to 60 lb.; (II) steam heating (range 0 to 30 lb., retard); (III) hot water heating (range 0 to 70 ft.); and (IV) compound vacuum and steam heating (range 30 in. vacuum to 30-lb. pressure, retard). Gives detail requirements; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-G-76; 1935. Gages; Pressure and Vacuum, (for) Air, Ammonia, Oil, Steam, and Water. Covers five types designed for gage-board mountings—(A) pressure gages, up to 800 lb.; (B) pressure, 800 lb. and over; (C) vacuum and compound; (D) ammonia; and (E) duplex. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 18G4b; 1944. Gage-Testing Outfits; Portable.

U. S. Gov., Navy Dept. Specification 45D1; 1940. Dampeners; Pulsation, for Use With Pressure Gages.

U. S. Gov., Navy Dept. Specification 45G1n; 1945. Gages; Pressure and Vacuum, for Air, Ammonia, Steam, Oil, and Water.

U. S. Gov., Navy Dept. Specification 45G3a; 1929. Gages; Pressure, Acetylene, Hydrogen, and Oxygen.

U. S. Gov., Navy Dept. Specification 45G4b; 1941. Gages; Pressure.

U. S. Gov., Navy Dept. Specification 45G6c; 1944. Gages; Draft, Fireroom.

U. S. Gov., Navy Dept. Specification 45G7b; 1944. Gages; Pressure, for Direct Stem Mounting.

U. S. Gov., Navy Dept. Specification 45C9; 1940. Gages; Absolute Pressure, Indicating Type, Shipboard Use.

U. S. Gov., Navy Dept. Specification 45G10a; 1944. Gages; Boiler-Water.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 91-56A; 1934. Gage; Tire.

References.—Water level gage glass, lubricator glasses, *see* 526.6; calibration of gages, *see* 793.0; dimensional gages, hand gages, *see* 615.82.

793.3 INDICATORS, ENGINE CYLINDER

U. S. Gov., Navy Dept. Specification 1311; 1922. Indicators; Engine, Internal-Combustion.

U. S. Gov., Navy Dept. Specification 18I2c; 1936. Indicators; Engine, Steam.

793.4 WATER METERS

American Society of Heating and Ventilating Engineers. Code for Use of Pitot Tube, 1914.

American Water Works Assn. Tentative Standard Specifications for Cold Water Meters, Displacement Type, 7M.1-T; 1941. Covers scope, kind and type, capacity, size, length, cases, external case bolts, connections, registers, register boxes, intermediate gear trains, measuring chambers, strainers, seal wire holes, registration, pressure test, workmanship and materials, rejected meters, sample meter, and notes.

Hydraulic Institute. Code for the Measurement of Water Using Standard I.S.A. Orifices With Free Discharge, 1941. Part I, application of the meter, covers scope, the free-discharge I.S.A. orifice meter, approach pipe, orifice plate and holder, manometer, test procedure, computations, accuracy, and head on pump; and part II, construction specifications, covers dimensions of orifice plate and holders, specific dimensions for I.S.A. orifice meters, meters for larger diameters and intermediate sizes, special instructions for orifice plate, manometers, calibration, materials, and list of meter manufacturers.

Technical Assn. of the Pulp and Paper Industry. Flow Measurements of White Waters and Wastes, Standard E2 p-41; 1941. Measurement of flow of liquid by use of weir, Venturi flume, submerged weir, orifice, and water meter. Includes details for construction of weir, weir readings and corrections, construction of Venturi flume and use in mill sewers, submerged weirs, with flow diagram; orifices and their use; and tables of weir flows, Venturi flume flows, and orifice flows.

U. S. Gov., Navy Dept. Specification 45M2b; 1941. Meters; Water, Cold and Hot, Positive Displacement Type, Shipboard Use.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Water Meters, 1943. Displacement type, 3/4 in. and 1 1/2 in. sizes.

References.—Calibration of meters, *see* 793.0; cast iron, cast bronze, *see* 611.11, 646.41.

793.5 WEIGHING SCALES AND BALANCES

American Hospital Assn., 40-7. Dietetic Scales. Covers one type, grade, and class.

American Hospital Assn., 70-25. Baby Scale. Covers one type, one grade, and one class of portable baby scale.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Large-Capacity Scales, Tolerances, S.R. Requirements, and Regulations.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Rules for the Location, Maintenance, Operation, and Testing of Railway Track Scales.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for the Manufacture and Installation of Four-Section, Knife-Edge Railway Track Scales. Gives requirements for capacity, working stresses and formulas, length of scale, scale levers, pivots and bearings, nose irons, lever fulcrum stands, loops and connections, checks, weighbeams and accessories, antifriction points and plates, clearances, interchangeability weighbridges, protection from corrosion, approach rails, dead rails and dead rail beams, deck, exclusion of dirt, lighting, location and elevation, foundation and pit, setting of scale, weighbeam house, sensibility reciprocal, tolerance, scale shed, and car pullers.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for the Manufacture and Installation of Hand-Operated Grain-Hopper Scales. Gives capacity, plans, working stresses and formulas, scale levers, pivots and bearings, nose irons, lever fulcrum stands, loops and connections, checks, weighbeams and accessories, antifriction points and plates, clearances, interchangeability, hopper and garner, foundation, installation, and performance requirements.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads.

Manual for Railway Engineering, 1942. Specifications for the Manufacture and Installation of Motor Truck, Built-In, Self-Contained, and Portable Scales for Railway Service. Covers knife-edge kind and applies basically to scales equipped with weighbeams. For automatic or recording type scales, or scales with automatic-indicating or recording attachments, the specifications apply to all parts except the mechanism essential to the automatic feature. Gives requirements for information to be supplied by purchaser, classes, capacities and sizes, working stresses, formulas, particulars of loading, scale levers, pivots and bearing steels, nose irons, loops and connections, lever fulcrum stands, checks, weighbeams and accessories, antifriction points and plates, clearances, interchangeability, sensibility reciprocal, performance requirements, location and elevation, foundations, weighbeam house or box, installation, platforms, light, drainage, ventilation, entrance to scale pit, and protection from corrosion.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for the Manufacture and Installation of Two-Section, Knife-Edge Railway Track Scale. Gives requirements for capacity, working stresses and formulas, length of scale, scale levers, pivots and bearings, nose irons, lever fulcrum stands, loops and connections, checks, weighbeams and accessories, antifriction points and plates, clearances, interchangeability, weighbridges, protection from corrosion, approach rails, exclusion of dirt, lighting, location and elevation, foundation and pit, setting of scale, weighbeam house, sensibility reciprocal, and tolerance.

American Road Builders' Assn. Standardization of Weighing Devices for Concrete Aggregate. Bulletin 15; 1931. This specification covers weighing devices for use with bin batcher and central mixing plant; requirements for construction of bin, hopper, scales, scale levers, pivots, leveling lugs, weigh beams, poises, graduated dials, arrangement, etc.

American Road Builders' Assn. Standardization of Weighing Devices for Concrete Aggregates (for Mixers of One-Half Cubic Yard Capacity or Less). Bulletin 15; 1931. Requirements for weighing container, scales, leveling, minimum graduations, clearance, calibration, and operation.

Assn. of American Railroads. Sponsored jointly by the Traffic Dept., Operations and Maintenance Dept. Scales, 1942. Covers four-section, knife-edge railway track scales; two-section, knife-edge railway track scales; and motor truck, built-in, self-contained, and portable scales for railway service. Rules and specifications apply generally to large-capacity weighing equipment. They were developed in the Construction and Maintenance Section, A.A.R. (American Railway Engineering Assn.), with the collaboration of the National Bureau of Standards, the National Scalemen's Assn., the Scale and Balance Mfrs. Assn., and the Traffic Dept., A.A.R.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C199; 1925. Hand-Operated Grain Hopper Scales. Requirements on permissible working stresses in various materials, in steel pins, and in concrete; design requirements on levers, nose irons, pivots, knife edges, bearings, loops, lever and beam fulcrum stands, weighbeam, hopper, and foundation; installation; test requirements.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Computing Scales. Requirements on value intervals on computing chart, location of indicators for weight and value, size and spacing of graduations, leveling provisions, tolerances on measurement.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Counter Scales. Requirements on general structural features, material of bearings, limits on size and spacing of graduations, leveling provisions, allowable sensibility reciprocal, allowable tolerances on measurements.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Cream Test and Butterfat Test Scales. Requirements on scale graduation, leveling provision, sensibility reciprocal, shift of weight test, tolerance on measurement.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Large Capacity Automatic-Indicating Scales. Not including railroad or counter scales, tolerances on accuracy of indications, kind of material for knife-edges, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Prescription Scales and Balances. For two classes dependent on accuracy, requirements on graduation markings of scales and indicators, leveling provision, sensibility reciprocal, allowable tolerances on measurement, material in knife-edges and bearings, etc.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Scales. General specifications. Definition of rated capacity, requirements on use of hardened steel for knife-edges and bearings, structural features, minimum width of graduations, definitions of balance and sensibility reciprocal.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Scales. Gives general definitions and detail specifications covering design, construction, and performance, as well as tolerances, of spring scales, computing scales, cream-test and butterfat-test scales, and prescription scales and balances.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Spring Scales. Requirements on size and spacing of graduations, structural and design features, tolerances on accuracy of indications and for shift of load test at half capacity.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Weights. Permissible materials, requirements on finish, protective coating, marking of value on weight, tolerances allowed on weights for avoirdupois system, for apothecaries' system, and for metric system, for weights up to 50 lb.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Wheel-Load Weighers. Used for determining the axle loads of trucks on highways; requirements on accuracy.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T199; 1921. Method of Precision Test of Large-Capacity Scales. Outlines a scientific and systematic method used by the Bureau for testing railroad master and grain hopper scales; includes means for accurately measuring the position of the beam.

U. S. Gov., Federal Specification AAA-S-79; 1942. Scales; Motor-Truck, Built-In, and Self-Contained. Specifies requirements to conform to U. S. Gov., Dept. of Commerce, National Bureau of Standards Letter Circular LC663, Specifications for the Manufacture and Installation of Motor-Truck, Built-In, Self-Contained, and Portable Scales, 1941; method of inspection and test; and marking.

U. S. Gov., Federal Specification AAA-S-91; 1935. Amendment 1; 1944. Scales; Prescription. Covers a single type for weighing by pharmacists of the ingredients of medicinal and other formulas prescribed by physicians and others; having an equal-arm lever system, stabilized pans, and a fully-enclosed lever system. Gives requirements for workmanship, materials, finish, capacity and class marking, balancing means, conditions of level, arresting means, indicating means, antifriction elements, pivots, bearings, weighbeam and poises, pans, permanency and maintenance of accuracy, and details; method of inspection and test; and packaging, packing, and marking.

U. S. Gov., Federal Specification AAA-S-101a; 1942. Scales; Railroad-Track. Specifications and tolerances set forth in Bureau of Standards Circular 83, shall be complied with in all respects. Gives methods of inspection and test.

U. S. Gov., Federal Specification AAA-S-121b; 1943. Amendment 1; 1944. Scales; Weighing, General Specifications. Applicable to all types and classes of commercial weighing scales except cream-test and butter-fat-test scales, computing scales, person-weighing scales, wheel-load scales and weighers, prescription scales, motor truck, built-in, self-contained, and railway track. Defines basic requirements only and is to be supplemented in the invitation for bids by a description of the detail requirements defining the specific type and class of scale desired. Gives definitions, general requirements, and detail requirements; methods of inspection and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 16Ye; 1941. Refrigerating Equipment. Includes requirements for track scales and ice-making equipment.

U. S. Gov., Navy Dept. Specification 18S13d; 1942. Scales; Weighing.

U. S. Gov., Navy Dept. Specification 58S1; 1929. Scales; Platform.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2158C; 1940. Balance; Analytical, Chain Weight.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2159A; 1941. Weights for Analytical Balance.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2228A; 1941. Balance, Analytical; Rest for, Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2229A; 1941. Balance; Prescription.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2230A; 1941. Balance Prescription; Weights.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2233A; 1939. Scale; Physicians.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2441; 1937. Scale; Baby.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2493; 1939. Scale; Dietetic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2519; 1939. Balance; Portable, With Weights.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2675; 1939. Balance; Prescription, Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-36; 1939. Scale; Meat, Beam.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-95; 1939. Scale; Grocers'.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-2B; 1937. Scale PH-14-A; Weighing, Photographic.

References.—Weights for use with scales and balances, *see* 919.1; railway cars, *see* 726.1.

793.6 LIQUID MEASURING DEVICES

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Hand-Operated Discharge Devices and Hand-Operated Pumps, 1930. For dispensing motor fuels at automobile filling stations, installed in accordance with the regulations of the National Board of Fire Underwriters. Gives minimum requirements for construction of housing, pumping unit, removable head, stuffing boxes, rotor, mechanism, piping, hose, and accessories. Also includes wiring, locking, and labeling.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Outside Visible-Measure Discharge Devices, 1929. For use in dispensing motor fuels at automobile filling stations, installed in accordance with regulations of the National Board of Fire Underwriters. Covers construction of housing, pumps, air and vacuum systems, control mechanism, metering, piping, hose, electrical equipment, locking, and labeling.

Underwriters' Laboratories, Inc. Standard for Power-Operated Discharge Devices, 1930. For dispensing motor fuels at filling stations, installed in accordance with the regulations of the National Board of Fire Underwriters. Housing or enclosure, power pumps, delivery capacity and pressure, bypass and relief valves, metering, piping and hose fittings, control mechanism, electrical equipment, switches, locking, and labeling.

Underwriters' Laboratories, Inc. Standard for Power-Operated Pumps and Discharge-Device-Accessory Pumps, 1938. Pumps for dispensing motor fuels at filling stations, etc., installed in accordance with the regulations of the National Board of Fire Underwriters. Covers construction of base, body, head, stuffing boxes, rotor, cylinder, piston, relief valve, piping, tests, workmanship, and labeling.

U. S. Gov., Army Air Forces. Specification 27478-B; 1945. Meter; Fuel Flow, Type B-1A, Remote Indicating, Autosyn, Aircraft, 26 Volts, 400 Cycles.

U. S. Gov., Army Air Forces. Specification 27479A-1; 1944. Meter; Fuel Flow, Type B-2, Remote Indicating, Autosyn, Aircraft, 26 Volts, 400 Cycles.

U. S. Gov., Army Air Forces. Specification 27480B-2; 1945. Meter; Fuel Flow, Type B-3A, Remote Indicating, Autosyn, Aircraft, 26 Volts, 400 Cycles.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-41-1; 1944. Flowmeters; Fuel.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-1(2); 1944. Pump Assemblies; Fluid Metering, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-2a-1; 1944. Pump Assembly; 2 G.P.H. Fluid Metering, Type A.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-41; 1943. Pump Assembly; 5 G.P.H. Fluid Metering, Type B.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. These refer to mechanisms or machines adapted to measure and deliver liquid by volume, both wholesale and retail. Detail requirements are given for design, construction, and kind of materials used, as well as allowable tolerances.

U. S. Gov., Federal Specification GG-M-191; 1931. Measuring Devices; Liquid, Retail Type. Covers devices which on account of character of their primary indicating elements are obviously designed for unit deliveries of less than 50 gal. Does not apply to water meters of any size or to grease-measuring devices. Gives detail requirements; method of inspection and tests; and requirements for packing and marking.

U. S. Gov., Navy Dept. Specification 41R8; 1936. Rules; Oil-Sounding, Jointed.

U. S. Gov., Navy Dept. Specification 45M1d; 1938. Meters; Fuel, Shipboard Use.

U. S. Gov., Navy Dept. Specification 45M3; 1938. Meters; Gasoline, Shipboard Use.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Diesel-Oil Metering Equipment, 1944. Consists of two meters, each having an orifice plate and flanges for 12 in. pipe as the primary device, an indicating, integrating, and recording manometer, and a contact-making device as the secondary device.

U. S. Gov., Veterans Administration. Specification VA-M-75; 1933. Gasoline Storage Tank and Pump.

U. S. Gov., Veterans Administration. Specification VA-MC-49b; 1941. Gasoline Storage Tank and Pump.

References—Other power operated pumps, *see* 755.1; water meters, *see* 793.4.

793.7 GREASE-MEASURING DEVICES

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Grease-Measuring Devices. These refer to mechanisms or machines adapted to measure and deliver grease or transmission oil by weight. Specification requirements are given relative to the construction, design, and Materials used, including allowable tolerances.

793.9 MISCELLANEOUS MEASURING AND RECORDING APPARATUS

U. S. Gov., Army Air Forces. Specification 40400 (1); 1942. Meter; Ground Flow Check, Oxygen System.

U. S. Gov., Navy Dept. Specification 18M7; 1941. Meters; Moisture, for Determination of Moisture Content of Lumber.

References.—Fabric measuring devices, *see* 390.4; electric meters, *see* 714.3; standard weights and measures, *see* 919.1.

794. LUBRICATING DEVICES

Assn. of American Railroads. Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Lubricators, fittings for locomotives, dimensional drawings for location of joints and holding arm, pipe joints and fittings, and holding arm. Shows form of thread, length, shoulder, size of nut, etc.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-38; 1944. Fittings; Pressure-Grip Lubricator.

U. S. Gov., Navy Dept. Specification 10S2; 1944. Strainers; Lubricating-Oil, Small.

U. S. Gov., Navy Dept. Specification 41G5e; 1941. Guns, Lubricating, Pressure, Hand-Operated; and Fittings, Shipboard Use.

U. S. Gov., Navy Dept. Specification 45C6c; 1943. Cups; Oil.

U. S. Gov., Navy Dept. Specification 45C7b; 1943. Cups; Grease.

U. S. Gov., Treasury Dept., Procurement Div., 250A; 1942. Guns; Lubricating, Cartridge Type. Shall be made of rolled drawn iron or steel. Gives requirements for type, capacity, cartridge-attaching means, barrel, feed, mechanism, pump unit, pump packing, discharge nozzle, gaskets, interchangeability, attachments, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-MC-156a; 1941. Lubricating Oil Tank With Pump; 60-Gallon Capacity.

795. MECHANICAL GOVERNORS

American Society of Mechanical Engineers. Power Test Code. Speed-Responsive Governors, 1927. Covers performance of speed-responsive governors as applied to steam turbines, hydraulic turbines, reciprocating steam engines, and reciprocating oil and gas engines when employed for driving electrical generators, mills, etc., or for uses where the speed-regulation requirements are similar to those for electrical generators; with auxiliary sections on general considerations, measurement of time, and speed measurements.

References.—General requirements for test codes, *see* 700; steam turbines, *see* 701.2.

796. WATER PURIFICATION UNIT

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-339. Sea Water Distilling Equipment.

U. S. Gov., Joint Army-Navy Specification JAN-D-164; 1944. Distillation Unit; Skid Mounted, Thermocompression Type, 3,000 Gallons Per Day.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 87-5; 1942. Water Purification Unit; Portable.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 87-6A; 1944. Water Purification Unit; Gasoline Engine Driven, Truck Mounted 75 G.P.M.

797. SAFETY APPLIANCES, DEVICES, AND EQUIPMENT

References.—Safety belts and straps, *see* 069.3; safety code for ladders, *see* 429.4; safety writing papers, *see* 478.33; safety code for building exit, *see* 518.51; safety code for abrasive wheels, *see* 541.3; safety chain, *see* 603.56, 631.9; safety codes for gas, electrical and lighting, *see* 710, 607.0, 715.50; safety valves, *see* 607.6; safety code for pulverized-fuel systems, *see* 703.9; safety codes for transportation, ventilation, and electrical equipment for coal mines, *see* 750, 710; safety code for colors for traffic signals, *see* 718.5; safety code for automobile brakes, *see* 722.38; aeronautic safety codes, *see* 724.3; safety codes for elevators and escalators, *see* 734.3; safety codes for forging and hot metal stamping and for power presses, *see* 760; safety code for power-transmission, *see* 766.0; safety code for protection of industrial workers in foundries, *see* 768; safety codes for textiles, paper and pulp mills, logging and sawmill machinery, and wood-working plants, *see* 770, 782, 784.0; safety code for rubber mills, *see* 783; code for mechanical refrigeration, *see* 785.0; code for laundry machinery, *see* 787; codes for prevention of dust explosions and for pulverizing systems for sugar and cocoa, *see* 789; code for protection of heads and eyes of industrial workers, *see* 914.5; safety matches, *see* 991; safety code for gas-mask canisters, *see* 993.

797.0 GENERAL ITEMS

National Conservation Bureau. A Series of Pocket Size Pamphlets for Employees on Safety Instructions. No. 302; 1939, Restaurant Safety Rules. No. 303; 1940, Automobile Service Station Safety Instructions. No. 304; 1940, Mercantile Establishments Safety Instructions. No. 305; 1939, Apartment House Safety Instructions. No. 313; 1940, Theater Safety Instructions. No. 314; 1940, Laundry Safety Instructions. No. 315; 1940, Bakery Safety Instructions. No. 327; 1941, Food Store Safety Instructions. No. 336; 1943, Textile Mill Safety Instructions. No. 337; 1943, Office Building Safety Instructions.

National Conservation Bureau. Getting Results Through Traffic Engineering, No. 203C, Booklet I—gives examples 1 through 24 of the "Before and After" traffic engineering examples. No. 203D, Booklet II—gives examples 25 through 48 containing many examples of interest to war plant transportation supervisors, covering such procedure as group riding, staggering of hours, improving public transit service, timing of traffic signals, elimination of unnecessary stops, and pooling deliveries.

National Conservation Bureau. Handbook of Industrial Safety Standards, including Supplement on Wartime Protection, 1942. This handbook is a compilation of generally recognized industrial safety requirements and aims to cover not the entire field of industrial safety, but only the more important items. Covers supervision, inspection and employee education; first aid and hospital; resuscitation; personal protection; housekeeping and storage of materials; sanitation; illumination; building exits; protection against tripping and falling; elevators; traveling cranes; handling and transportation of material; steam boilers; unfired pressure vessels; engines and turbines; identification of piping; electrical equipment; mechanical power transmission equipment; moving parts of machines; guards for woodworking machines; guards for metal working machines; guards for paper and printing machines; guards for leather working machines; guards for textile and laundry machines; guards for machines in the food industry; guards for rubber working and similar machines; hand tools; exhaust; explosive vapors and gases; spray coating; tank operations; acids and caustic liquids; supplement includes duties of the defense coordinator; fire protection; incendiary bombs; warden services; police protection and the prevention of sabotage; medical services; operation and maintenance protection; camouflage or protective concealment; blackout methods and materials.

National Conservation Bureau, No. 137. Standardization a Force in Promoting Safety. Describes National Conservation Bureau's activities in promoting standardization in safety campaigns.

National Conservation Bureau, No. 321; 1940. Accident Reporting and Recording. Describes frequent weaknesses in present methods of accident reporting and outlining a practical formula method.

Underwriters' Laboratories, Inc., 1944. Lists of Inspected Applicances Relating to Accident Hazard, Automotive Equipment, Burglary Protection. This catalog contains three lists that have been inspected by the Underwriters'. The lists are appliances inspected for accident hazard; inspected automotive appliances; and inspected burglary protection appliances. The listings are arranged alphabetically by name of manufacturer under each subject.

Underwriters' Laboratories, Inc., 1944. List of Inspected Gas, Oil, and Miscellaneous Appliances. This catalog lists gas, oil, and miscellaneous appliances that have been inspected by the Underwriters'. Section I includes devices, materials, and systems which have been examined with reference to fire hazards and such accident hazards as are involved in the class under which they are listed. Section II includes products classified as to fire hazard only. There is an index and the items are arranged alphabetically in each section, as to the subject and alphabetically by name of manufacturer under each subject.

U. S. Gov., Dept. of the Treasury, Bureau of Public Health Service. American Standards Assn., Z4.1-1935. Safety Code for Industrial Sanitation in Manufacturing Establishments. Applies to all permanent places of employment in which articles are manufactured, repaired, cleaned, sorted, or renovated, in whole or in part, for profit, sale, or compensation.

797.1 PROTECTIVE CLOTHING

U. S. Gov., Federal Specification GGG-H-171; 1938. Helmets; Babbitting. Covers one type. Gives requirements for design and construction, finish, body of helmet, apron, headgear, window, window container, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-H-201; 1938. Helmets and Masks; (for) Abrasive-Cleaning. Covers one type of helmets for outside blasting, and one type of masks for inside blasting. Gives requirements for construction, principal parts, face-piece, spare parts, needle valve, body harness, lens protective assembly, filter cartridge, chemical absorbent, filter material, and efficacy of equipment; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-H-211; 1938. Amendment 1; 1942. Helmets and Shields; Hand-Held, Welders'. Covers one type. Gives requirements for design and construction, finish, body of helmet or shield, filter-glass mounting, filter glasses, cover glasses, transmission and tolerances in transmission of various shades of glasses, head gear for helmet, and hand for hand shield; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 37H4c; 1944. Helmets and Shields; Hand-Held, Welders'.

U. S. Gov., Navy Dept. Specification 37H7a; 1931. Helmets; Aviators', Communication, Gosport.

U. S. Gov., Navy Dept. Specification 37H8a; 1934. Helmets; Aeronautical, Fabric, Unlined.

U. S. Gov., Navy Dept. Specification 37H10; 1939. Helmets; Jungle-Cloth.

U. S. Gov., Navy Dept. Specification 37H11b; 1944. Hats; Protective.

U. S. Gov., Navy Dept. Specification 37H12; 1945. Helmets; Welders' (Protective Hat Combination).

U. S. Gov., Treasury Dept., Procurement Div., 494b; 1942. Guards; Protective, Foot and Shin. Shall be one grade in three types—(I) foot guards (metal), (II) foot and shin guards (metal), and (III) shin guards (vulcanized fiber). Intended for protecting feet and shins of workers from occupational hazards. Gives detail requirements for each type; methods of sampling, inspection and tests; and packaging, packing, and marking.

797.2 LIFE PRESERVERS

U. S. Gov., Army Air Forces. Specification No.3240; 1944. Preserver; Pneumatic Life Vest, Type B-5.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-18-1; 1944. Vests; Pneumatic Life.

U. S. Gov., Joint Army-Navy Specification JAN-P-45; 1944. Preservers; Life, Belt, Self-Inflating, Dual-Tube.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Life Preservers, 1944. Jacket type, reversible, adult.

800-899 CHEMICALS AND ALLIED PRODUCTS

800-809 COAL-TAR PRODUCTS

800.0 GENERAL ITEMS

American Society for Testing Materials, E 20-33 T; 1933. Tentative Method of Test for Particle Size Distribution of Subsieve Size Particulate Substances. Covers the range of sizes between the 74-micron (No. 200) sieve and 0.2-micron. The method is applicable to homogeneous materials. Definitions, rough separation of sample into size groups, preparation of mount, procedure, measurement of diameter, scale limits for measurement, and expression of results.

American Society for Testing Materials, E 24-42; 1942. Definitions of Terms Relating to Rheological Properties of Matter. Defines consistency, plasticity, elasticity, liquid, simple liquid, plastic and elastic solids, etc.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Fire-Hazard Properties of Flammable Liquids, Gases, and Volatile Solids. Gives tables showing flash point, ignition temperature, explosive limits, specific gravity, vapor density, boiling point, Underwriters' Laboratories classification, and extinguishing agents.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Table of Common Hazardous Chemicals. Covers flammable limits and explosive range, ignition temperature, propagation of flame, flash point, oxygen breathing equipment or helmets; and gives table of common hazardous chemicals showing usual shipping container, fire hazard, life hazard, storage, fire fighting phases, and remarks.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples, Hydrocarbons. Gives 45 standard samples of hydrocarbons including n-pentane, 2-methylbutane (isopentane), n-hexane, 2-methylpentane, 3-methylpentane, 2, 2-dimethylbutane, 2, 3-dimethylbutane, methylcyclopentane, cyclohexane, benzene, methylbenzene (toluene), ethylbenzene, 1, 2-dimethylbenzene (o-xylene), 1, 3-dimethylbenzene (m-xylene), and 1, 4-dimethylbenzene (p-xylene). These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis, for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M126; 1937. Temperature Interconversion Tables (C to F) and Melting Points of the Chemical Elements.

801. CRUDE COAL-TAR PRODUCTS

801.0 GENERAL ITEMS

801.1 BENZENE (BENZOL)

American Chemical Society. Specifications for Analytical Reagents, 1941. Benzene. Gives requirements for boiling range, solidification temperature, nonvolatile matter, substances darkened by sulfuric acid, thiophene, sulfur compounds, and tests.

American Society for Testing Materials, D 361-36; 1936. Industrial 90 Percent Benzene (Benzol). Covers limiting values for specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and sulfur as H_2SO_4, with requirements for tests in accordance with A.S.T.M. method D 268.

American Standards Assn., Z 37.4-1941. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Benzene. Prescribes the permissible concentration of benzene in the atmosphere of work places for the protection of the health of all workers. Gives properties of benzene, permissible concentration, sampling, and analytical methods.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 2, Part 1; 1938. The Determination of Benzol Vapor in the Atmosphere. Covers taking of sample, analysis of samples, and sample calculation.

U. S. Gov., Federal Specification VV-B-231; 1942. Benzol (Benzene); Technical-Grade. Covers one type and grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51B3d; 1940. Benzol.

U. S. Gov., U. S. Army, Army Air Forces. Specification 2-58B; 1930. Benzol; Aviation Grade.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-1016B; 1936. Benzene.

References.—Testing of lacquer solvents and diluents, *see* 822.0.

801.2 TOLUENE

American Chemical Society. Specifications for Analytical Reagents, 1941. Toluene. Gives requirements for boiling range, nonvolatile matter, substances darkened by sulfuric acid, sulfur compounds, water, and tests.

American Society for Testing Materials, D 362-36; 1936. Industrial Pure Toluene (Toluol). Limiting values for specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and sulfur as H_2SO_4, with tests in accordance with A.S.T.M. method D 268.

American Standards Assn., Z 37.12-1943. Allowable Concentration of Toluene. To prescribe the permissible concentration of toluene in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Covers general properties, physical-chemical properties, toxic properties, permissible concentration, sampling procedure, and analytical methods.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Toluol (Toluene; Methylbenzene). Covers definition, constants, solubility, derivation, uses, grades, containers, hazards, shipping regulations, and substitutes.

Society of Automotive Engineers. Aeronautical Material Specification No. 3180; 1940. Toluene Thinner (Commercial). This is a thinner used primarily for various enamels and primers but may be used in manufacture of organic protective coatings. It specifies the quality and grade of thinner, distillation test, corrosion test, and method of rejection.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-T-541; 1941. Toluene.

U. S. Gov., Marine Corps Specification, adopted 1934. Toluene (Toluol).

U. S. Gov., Navy Dept. Specification 52T7; 1938. Toluene (Toluol).

U. S. Gov., Treasury Dept., Procurement Div., No. 502; 1941. Toluene (Toluol); Technical-Grade. Covers one type and one grade intended for use as a diluent or nonsolvent ingredient in the manufacture of organic protective coatings. Gives requirements for appearance, color, odor, specific gravity, nonvolatile matter, sulfur, water, acidity, spot test, distillation range, copper corrosion, and wash test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-38D. Toluene.

References.—Testing of lacquer solvents and diluents, *see* 822.0.

801.3 CREOSOTE AND WOOD PRESERVATIVES

American Assn. of State Highway Officials, M133-42. Standard Specifications for Timber Preservatives. Includes creosote oil, creosote-coal-tar solution, creosote-petroleum solution, zinc chloride, sodium fluoride-arsenate dinitrophenol solution, chromated zinc chloride, and zinc meta arsenite. Gives properties and methods of sampling and testing.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Creosote. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Creosote. Gives description, miscibility, specific gravity, distilling range, identification, reaction, so-called coal-tar creosote, hydrocarbons and bases, phenol and so-called coal-tar creosote, other impurities, storage, and average dose.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1939. Specifications for Creosote Analysis. Covers percentage of water, insoluble in benzol, specific gravity, distillation, specific gravity of creosote fractions, float test, coke residue, and standard methods for the determination of tar acids in creosote.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Membrane Waterproofing. Gives requirements for creosote primer.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Preservatives. Gives requirements for creosote, creosote-coal-tar solutions, and zinc chloride.

American Society for Testing Materials, D 38-33; 1933. American Assn. of State Highway Officials, T 60-42. Methods of Sampling and Testing Creosote. Requirements for continuous drip, routine zone, and referee methods of sampling; applications, apparatus, and procedures in accordance with A. S. T. M. methods of testing for water, matter insoluble in benzol, specific gravity, distillation, float test of residue, and coke residue.

American Society for Testing Materials, D 43-41; 1941. American Assn. of State Highway Officials, M 121-42. Creosote for Priming Coat With Coal-Tar Pitch in Dampproofing and Waterproofing. For application to concrete and masonry surfaces, for use with coal-tar pitch in dampproofing and waterproofing. Maximum water, consistency, specific gravity, matter insoluble in benzol, distillation range, coke residue, procedure for sampling, and methods of testing.

American Society for Testing Materials, D 168-30; 1930. American Assn. of State Highway Officials, T 61-42. Method of Test for Coke Residue of Creosote. Describes crucible and electric tube furnace, using residue resulting from distillation test obtained from A. S. T. M. method D 246, procedure and calculation for percentage. A. R. E. A. Method for Coke Residue of Creosote.

American Society for Testing Materials, D 246-42; 1942. American Assn. of State Highway Officials, T 62-42. Method of Test for Distillation of Creosote. Covers test suitable for all types and grades of creosote and mixtures of creosote with tars and oils used in timber preservation. Describes apparatus, preparations of sample, dehydration of sample, assembly of apparatus, and outline of procedure for test. Conforms to American Railway Engineering Assn. method of test for distillation of creosote.

American Society for Testing Materials, D 324-41; 1941. Definitions of Terms Relating to Timber Preservatives. Defines coal tar, coke-oven tar, creosote, creosote-coal-tar solution, creosote-distillate, creosote oil, gas-house coal tar, and water-gas tar.

American Society for Testing Materials, D 347-33; 1933. Volume and Specific Gravity Correction Tables for Creosote and Coal Tar. For reducing volumes to the basis of 100°F. (38°C.) and for reducing specific gravity to the same temperature; includes creosote, solutions (up to 50 percent coal tar) and for coal tar. These tables were prepared by the National Bureau of Standards for use of the wood preserving industry. Conforms to American Railway Engineering Assn. volume and specific gravity correction tables.

American Society for Testing Materials, D 367-33; 1933. American Assn. of State Highway Officials, T 81-42. Methods of Test for Insoluble Matter in Creosote. Includes porous thimble method, and for routine procedure the asbestos mat method for the extraction of insoluble matter (free carbon) from creosote and creosote-coal-tar solutions with hot benzol. Covers apparatus and method of procedure. Conforms to American Railway Engineering Assn. methods for insoluble matter in creosote.

American Society for Testing Materials, D 368-33; 1933. American Assn. of State Highway Officials, T 82-42. Method of Test for Specific Gravity of Creosote. For determining specific gravity by use of two conventional hydrometers standardized at 15.5/15.5°C. and reading 1.000 to 1.080 and 1.070 to 1.150 by .001. Conforms to American Railway Engineering Assn. method of test for specific gravity of creosote.

American Society for Testing Materials, D 369-33; 1933. American Assn. of State Highway Officials, T 74-42. Method of Test for Specific Gravity, 38/15.5°C., of Creosote Fractions. For fractions either solid or liquid at 38°C., and other distillation fractions where only small amounts are available. Requires use of pycnometers, water bath, special thermometer, and outlines procedure for testing. Conforms to American Railway Engineering Assn. method of test for specific gravity of creosote fractions.

American Society for Testing Materials, D 370-33; 1933. American Assn. of State Highway Officials, T 83-42. Method of Test for Water in Creosote. For creosote and creosote-coal-tar solution, for dehydrating creosote containing over 3 percent water for distillation test, and alternative method where rapid determination of water only is required. Covers still and condenser, apparatus assembly, and outlines of methods of procedure. Conforms to American Railway Engineering Assn. method of test for water in creosote.

American Society for Testing Materials, D 390-36; 1936. Creosote. For use in the preservative treatment of timber by creosote distilled from coal-gas or coke-oven tar. Allowable percentage of water, matter insoluble in benzol, specific gravity, distillation range, and coke residue, sampling and testing in accordance with A.S.T.M. methods. Conforms with American Railway Engineering Assn. specifications for creosote.

American Society for Testing Materials, D 391-36; 1936. Creosote-Coal-Tar Solution. Covers product of at least 80 percent distillate of coal-gas or coke-oven tar for preservative treatment of timber. Gives allowable percentage of water, matter insoluble in benzol, specific gravity, distillation range, and coke residue, sampling and testing in accordance with A.S.T.M. methods. Conforms to American Railway Engineering Assn. specification for creosote-coal-tar solution.

American Society for Testing Materials, D 453-41; 1941. Method of Test for Tar Acids in Creosote and Creosote-Coal-Tar Solutions. Covers the procedure for determining the amount of tar acids in fractions distilled from creosote and creosote-coal-tar solutions. Apparatus procedure and calculation.

American Transit Assn. Standard Preservative Oils Suitable for Non-Pressure Open Tank, Brush and Spray Treatments, W52-31; 1931. Gives detailed requirements, and composition and methods of tests of anthracene oil and heavy creosote oil.

American Wool-Preservers' Assn., 4f; 1936. Standard Specification for Creosote. Shall be a distillate of coal-gas tar or coke-oven tar. Gives requirements for maximum percentage of water, matter insoluble in benzol, specific gravity, distillation limits, and coke residue.

American Wood-Preservers' Assn., 5e; 1942. Standard Specification for Creosote-Coal-Tar Solutions. Shall be a pure coal-tar product obtained from the high temperature carbonization of coal and is in four grades. Gives requirements for percentage of coal-tar distillate, maximum water, matter insoluble in benzol, coke residue, specific gravity, and distillation range.

American Wood-Preservers' Assn., 6b; 1926. Standard Float Test of the Residue in Creosote Oil. Gives requirements for apparatus, diagram of set-up, preparations of sample, and method of procedure.

American Wood-Preservers' Assn., 7d; 1933. Standard Method for the Determination of Coke Residue in Creosote Oil. Gives diagram of electric tube furnace and requirements for apparatus, procedure, and calculations.

American Wood-Preservers' Assn., 8b; 1933. Standard Method for the Determination of the Amount of Material Insoluble in Benzol. Gives description of apparatus necessary and outline of procedure.

American Wood-Preservers' Assn., 9c; 1934. Standard Method for the Determination of the Specific Gravity, 38°/15.5°C., of Creosote Fractions. For determining the specific gravity of the relatively small amounts of distillation fractions of creosote and is also suitable for creosote-oil and creosote-coal-tar solution where only small amounts are available. Gives requirements for apparatus, calibration of pycnometer, procedure, and calculation.

American Wood-Preservers' Assn., 10d; 1936. Standard Method for the Determination of Water in Creosote. For determining the percentage of water in creosote, also for dehydrating creosote containing water in preparation for the distillation test. This method is suitable for creosote, tar, petroleum and mixtures thereof. Gives requirements for apparatus, sampling, and procedure.

American Wood-Preservers' Assn., 11f; 1941. Standard Distillation of Creosote. Suitable for all types and grades of creosote, tar, and mixtures of creosote with tars used for timber preservation. Gives requirements for apparatus, preparation of sample, and procedure.

American Wood-Preservers' Assn., 13c; 1933. Volume and Specific Gravity Correction Tables for Creosote, Creosote-Coal-Tar Solution (Up to 50 Percent Tar), and Coal Tar (Coke-Oven Tar). Table of factors for determining volume of 100°F. occupied by unit volume at temperatures ranging from 60 to 220°F. Also table of factors for determining specific gravity at 100°F. when temperatures range from 60 to 220°F.

American Wood-Preservers' Assn., 15b; 1938. Standard Specification for Preservatives for Flooring and Paving Blocks. Includes coal-tar creosote. Gives requirements for water content, matter insoluble in benzol, specific gravity, distillation limits, and coke residue.

American Wood-Preservers' Assn., 18c; 1933. Standard Method for the Determination of the Specific Gravity of Creosote Oil. Description of standardized hydrometers, standard temperature of oil, and corrections.

American Wood-Preservers' Assn., 24f; 1939. Standard Specification for Preservative Oils for Non-Pressure Treatments. For creosote for open tank treatment, for creosote for brush and spray treatment, and anthracene oil. Gives requirements for water content, matter insoluble in benzol, specific gravity, distillate limits, and coke residue.

American Wood-Preservers' Assn., 25b; 1931. Standard Method of Sampling Creosote Oil in Tank Cars. Description of sampling device and alternative zone sampling apparatus; procedures for standard and simplified method for obtaining zone samples. Includes tables of combining factors for computing percentage of water in tank.

American Wood-Preservers' Assn., 26b; 1939. Standard Method for the Determination of Tar Acids. For fractions distilled from creosote and creosote-coal-tar solutions; description of tar-acid separatory funnel, types 1 and 2; procedure and formula for expression of result.

American Wood-Preservers' Assn., 31c; 1938. Standard Specification for Water-Gas-Tar Distillate for Use With Zinc Chloride. Gives requirements for maximum water, matter insoluble in benzol, specific gravity, distillate limits, and coke residue.

American Wood-Preservers' Assn., 32c; 1938. Standard Specification for Water-Gas-Tar Solution for Use With Zinc Chloride. Composed of distillate of water-gas-tar and refined or filtered water-gas-tar. Gives requirements for water content, matter insoluble in benzol, specific gravity, distillate limits, and coke residue.

U. S. Gov., Army Air Forces. Specification 14097 (1); 1939. Tar Acid Oil (Creosote Oil).

U. S. Gov., Federal Specification TT-W-531; 1941. Wood-Preservative; Anthracene-Oil (for) Brush, Spray, or Open-Tank Treatment. Covers one grade. Gives details requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-W-546; 1941. Amendment 1; 1944. Wood-Preservative; Celcure (Acid-Cupric-Chromate). Covers one grade. Gives requirements for preparation, chemical composition, impurities, retention of preservative, and determination of contents; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-W-551; 1941. Amendment 1; 1944. Wood-Preservative; Chromated-Zinc-Chloride. Covers one grade. Gives requirements for zinc chloride, sodium dichromate dihydrate, concentrated solution, and treating solution; tests shall be made in accordance with current standard methods of American Wood Preservers' Assn; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-W-556a; 1941. Amendment 1; 1944. Wood-Preservative; Coal-Tar-Creosote. Covers two types and shall be a distillate of coal-gas tar or coke-oven tar. Gives requirements for water, material insoluble in benzol, coke residue, specific gravity, and distillate limits for creosote for pressure treatment of poles or for mixing with petroleum and for treating ties, lumber, piles, posts, and miscellaneous structural timber; methods of sampling, inspection, and tests made in accordance with current standard methods of the American Wood Preservers' Assn.; and packaging, packing and marking for shipment.

U. S. Gov., Federal Specification TT-W-560; 1941. Wood-Preservative; Coal-Tar-Creosote (Crystal-Free), (for) Brush, Spray, or Open-Tank Treatment. Covers one grade made in accordance with current standard methods of the American Wood-Preservers' Assn. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification TT-W-566a; 1941. Wood-Preservative; Creosote-Coal-Tar Solution (for) Ties and Structural-Timbers. Covers one grade and two types. Gives detail requirements and methods of tests.

U. S. Gov., Federal Specification TT-W-568; 1941. Amendment 1; 1944. Wood-Preservative; Creosote-Petroleum-Solution. Covers one grade. Gives requirements for preparation, coal-tar creosote, petroleum, specific gravity, water and sediment, flash point and viscosity; tests shall be made in accordance with the standard methods of American Society for Testing Materials currently in effect; and methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification TT-W-573; 1941. Amendment 1; 1944. Wood-Preservative; Wolman-Salt (Tanalith). Covers one grade in dry form. Gives requirements for chemical composition and determination of content of sodium fluoride, disodium hydrogen arsenate, sodium chromate, and dinitrophenol; and methods of sampling, inspection, and tests.

References.—Zinc chloride as wood preservative, *see* 839.38; pressure process, brush and open tank processes of preservative treatments of lumber, *see* 400.42, 400.43; creosote carbonate, medicinal agents, *see* 803.23.

801.4 NAPHTHALENE, NAPHTHOL

American Institute of Homoeopathy. Homoeophathic Pharmacopoeia of U. S., 1941. Naphthalin. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Naphthalene. Covers definition, constants, solubility, derivation, uses, grades and forms, packing, fire hazards, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Betanaphthol. Description, solubility, melting point, indentification, ash, free acid, alphanaphthol, naphthalene or other organic impurities, and storage.

U. S. Gov., Federal Specification R-N-91; 1933. Naphthalene; Balls and Flakes. Covers one grade in two classes —(A) balls and (B) flakes. Gives requirements for color, solidifying point, residue on ignition, and solubility; methods of inspection and tests; and requirements for packaging, packing, and marking.

801.5 CRUDE COAL TAR

References.—Crude coal tar, *see* 505.3.

801.6 REFINED COAL-TAR OIL

References.—Coal-tar oil, *see* 505.37.

801.8 XYLENE (XYLOL)

American Chemical Society. Specifications for Analytical Reagents, 1941. Xylene. Gives requirements for boiling range, nonvolatile matter, substances darkened by sulfuric acid, sulfur compounds, water, and tests.

American Standards Assn., Z 37.10-1943. Allowable Concentration of Xylene (American War Standard). To prescribe the maximum permissible concentration of xylene in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Gives properties of xylene. permissible concentration, sampling procedure, and analytical methods.

U. S. Gov., Army-Navy Aeronautical Specification, AN-R-X-876-2; 1943. Xylene.

References.—Testing of lacquer solvents and diluents, *see* 822.0.

802. INTERMEDIATE COAL-TAR PRODUCTS

802.1 ACIDS

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid Benzoic. Gives requirements for melting point, nonvolatile matter, solution in ammonium hydroxide, chlorine compounds, heavy metals and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Benzoic Acid, Carbolic Acid, Picric Acid, and Salicylic Acid. Chemical symbol, synonyms, description, and preparations for triturations, tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and the National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Phenol (Glycerite of Carbolic Acid). Gives chemical composition, storage, average dose, and preparation.

The American Pharmaceutical Assn. and the National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phenolated Water (Carbolic Acid Water or Solutio Phenoli, P.I.). Gives chemical composition and storage.

The American Pharmaceutical Assn. and the National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pyrogallol. Gives chemical composition, description, solubility, melting point, identifications, ash, reaction, and storage.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Caustic Poisons. Phenol. Official method for determination of phenol in commercial cresols, saponified cresol solns, coal-tar dips, and disinfectants, and to kerosene solns of phenols, except in presence of salicylates or betanaphthol and in the presence of salicylates.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Dept., 1940. Includes general description and recommended uses for phenal and other intermediate coal-tar acids used in spotting department.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Phenol. Covers common name, constants, color and properties, derivation, solubility, uses, grades, and packing.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Acetylsalicylic Acid (Aspirin). Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, chloride, sulphate, free salicylic acid, heavy metals, substances insoluble in sodium carbonate, assay, and storage. U.S.P. Product of acetylsalicylic acid—Tabellae Acidi Acetylsalicylici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Acetylsalicylic Acid Tablets (Aspirin Tablets). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aminoacetic Acid. Description, solubility, identification, loss on drying, ash, carbonizable substances, reaction, chloride, sulphate, heavy metals, hydrolyzable substances, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Benzoic Acid. Description, solubility, melting point, identification, ash, carbonizable substances, chlorinated compounds, heavy metals, oxidizable impurities, assay, and storage. U.S.P. Product of benzoic Acid—Tinctura Opii Camphorata.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Liquefied Phenol (Liquefied Carbolic Acid). Description, solubility, specific gravity, boiling point, other requirements, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Methyl Salicylate (Oil of Wintergreen, Oil of Sweet Birch). Description, solubility, specific gravity, boiling range, optical rotation, refractive index, identification, reaction, heavy metals, limit of free acid, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenol (Carbolic Acid). Description, solubility, congealing temperature, indentification, nonvolatile residue, reaction, assay, and storage. U.S.P. Products of phenol—Phenol Liquefactum, Unguentum Phenolis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenol Ointment (Ointment of Carbolic Acid). Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Salicylic Acid. Description, solubility, melting point, identification, ash, carbonizable substances, chloride, sulfate, heavy metals, coloring matter, phenol, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Trinitrophenol (Picric Acid). Description, solubility, melting point, identification, reaction, sulfate, insoluble matter, and storage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Benzoic Acid, Sample 39f. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples (Microchemical Standards). Benzoic Acid, Sample 140. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., U. S. Army, Ordnance Dept., Specification 4-1028; 1929. Phenol.

802.2 ANILINE OIL AND SALTS

American Chemical Society. Specifications for Analytical Reagents, 1941. Aniline. Gives requirements for color, nonvolatile matter, hydrocarbons and nitrobenzene, boiling range, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Anilin and Anilin Sulfate. Chemical symbol, synonyms, description, and preparations for tincture and solutions for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Powder of Acetanilid. Gives chemical composition, description, identifications, storage, average dose, and preparation.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Oil; Aniline. Covers definition, derivation, solubility, purity, uses, and packing.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Acetanilid. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, and storage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples (Microchemical Standards). Acetanilide, Sample 141. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-145; 1941. Aniline; Technical.

802.3 DIPHENYLAMINE FOR SMOKELESS POWDER

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-27A; 1930. Diphenylamine.

U. S. Gov., Navy Dept. Specification 51D1b; 1941. Diphenylamine, Smokeless-Powder.

803. FINISHED COAL-TAR PRODUCTS

803.1 COAL-TAR COLOR, DYERS, AND STAINS

803.10 General Items

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Tabulation of American Dyes. Covers an extensive list of dyestuffs and chemical specialties related to textiles, tabulated alphabetically, and gives color index numbers, classification, manufactures, and foreign prototypes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Dyes. Covers definition, derivation and characteristics, classifications, containers, and marketing customs.

Technical Assn. of the Pulp and Paper Industry. Color Strength and Shade of Dyestuffs, Suggested Method T 628 sm-43; 1943. Following methods are designed for the evaluation of dyes used for coloring paper in terms of a preselected dye to be known as the standard dye. Covers sampling; method A—for calender coloring and dip dyeing includes apparatus, dye test solutions, procedure, and report; and method B—for beater dyeing, includes apparatus, reagents, preparation of test pulps, preparation of samples, procedure, formation of handsheets, dyeing the sheets, evaluation, report, precision, and additional information.

U. S. Gov., Federal Security Agency, Food and Drug Administration. S.R.A., F.D.C.3; 1940. Coal-Tar Color Regulations. Covers definitions, general specifications for straight colors, straight colors—food drugs and cosmetics, mixtures which may be certified, sampling, storage and packaging, certification, labeling, records of distribution, procedure for admitting colors to listing, and appendix.

References.—Standard color card for fabrics, *see* 306.0; methods of testing fastness of dyestuffs on fabrics, *see* 300.4.

803.11 Indigo, Natural and Synthetic

American Hospital Assn., 46-4. Laundry Bluing. Covers two classes in non-sour type and one class in sour type. Based on U. S. Gov. Federal Specification O-B-491.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Indigo. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

U. S. Gov., Federal Specification O-B-491; 1934. Bluing; Laundry. Covers two types: (I) Non-sour in two classes—(A) balls, blocks, or cubes; and (B) powder or tablet form and (II) sour type in powder or tablet form. Gives requirements for material, color of liquid, and fineness of suspended particles; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

803.12 Color Lakes

U. S. Gov., Navy Dept. Specification 52P8b; 1934. Part-Lake; Carriage.

803.13 Coal-Tar Food Colors

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Coloring Matters in Foods. Pigments and lakes, soluble coloring matters and their lakes, separation by immiscible solvents procedure, permitted coal-tar food colors, natural coloring matters, and commercial coal-tar food colors.

References.—Methods of test and analysis, *see* 803.10.

803.19 Miscellaneous Coal-Tar Colors, Dyes, and Stains

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Commission on Standardization of Biological Stains certifies dyes which are most suitable for preparing these solutions. Staining Solutions. Gives formulas for acid fuchsin solution, alcoholic eosin solution, aqueous eosin solution, aqueous methylene blue solution, basic fuchsin solution, Bismarck brown solution, Delafield's hematoxylin solution, Ehrlich's aniline gentian violet solution, Heidenhain's hematoxylin solution, hematoxylin and eosin solution, Hucker's gentian violet solution, iodine water, Loeffler's alkaline methylene blue solution, Mallory's stain, Mayer's hemalum solution, Nicolle carbol-gentian violet solution, neutral red solution, Pappenheim's methyl green-pyronin solution, safranin solution, Stirling's gentian violet solution, and Ziehl-Neelsen carbol-fuchsin solution.

U. S. Gov., Federal Specification O-E-571; 1932. Eosin Y (Color Index 768). Covers one grade. Gives requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 51D5; 1943. Dye; Direct, Khaki, for Landing Forces.

U. S. Gov., Navy Dept. Specification 52M5; 1944. Methyl-Violet-Toner, Dry Powdered Form.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 27-2A; 1938. Dye; Scarlet, for Igniter Pads.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 27-3; 1934. Dye; Green, for Cartridge Cloth.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-14; 1942. Dye; Aniline,

U. S. Gov., Veterans Administration. Specification VA-X-43b; 1941. Dye; Household, Package.

Reference.—Color numbers, *see* 803.10.

803.2 COAL-TAR MEDICINALS

803.20 General Items

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Coal Tar. Gives description, solubility, ash, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Acetanilid. Gives chemical composition, identifications, assay, and averages dose.

803.21 Dichloramine-T

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Dichloramine-T. Gives chemical Composition, description, solubility, melting point, identifications, chloroform-insoluble substances, assay, and storage.

803.22 Xylene

References.—Xylene, *see* 801.8.

803.23 Creosote Carbonate

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Creosote Carbonate. Gives description, miscibility, specific gravity, boiling point of creosote, identification, ash, free creosote, storage, and average dose.

Reference.—Creosote as a medicinal agent, *see* 801.3.

803.24 Orthocresol, Cresol

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cresol. Covers definition, derivation, types and grades, uses, and packing.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cresol. Description, solubility, specific gravity, distillation range, identification, reaction, hydrocarbons, and storage. U.S.P. product of cresol—Liquor Cresolis Saponatus.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Saponated Solution of Cresol (Compound Solution of Cresol). Characteristics of the liberated fatty acids, assay, storage, and alcohol content.

References.—Commercial cresol, coal-tar dips, *see* 803.4.

803.25 Thymol

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Thymol. Description, solubility, melting point, identification, nonvolatile matter, reaction, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Thymol Iodide. Description, solubility, identification, loss on drying, ash, soluble halides, alkalies, free iodine, assay, and storage.

803.29 Miscellaneous Coal-Tar Medicinals

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Nitro Benzol and Salol. Chemical symbol, synonyms, description and preparations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Chloroformic Solution of Coal Tar. Gives chemical composition, description, storage, external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Liquid Petrolatum With Phenolphthalein. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Coal Tar. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Coal Tar (Liquor Carbonis

Detergens). Gives chemical composition, description, identification, storage, alcohol content, average dilution for external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Acetophenetidin and Phenyl Salicylate (Phenacetin and Salol Tablets). Gives chemical composition, identifications, assay for acetophenetidin and for phenyl salicylate, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Phenolphthalein. Gives chemical composition, identification, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Phenyl Salicylate (Salol Tablets). Gives chemical composition, identifications, uncombined phenol or salicylic acid, assay, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Acetophenetidin. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, acetanilid, paraphenetidin, and storage. U.S.P. product of acetophenetidin—Tabellae Acetophenetidini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Acetophenetidin Tablets (Phenacetin Tablets). Identification, acetanilid, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Amaranth. Description, solubility, color, standard, and storage. U.S.P. product of amaranth—Liquor Amaranthi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenolphthalein. Description, solubility, melting point, identification, loss on drying, ash, arsenic, heavy metals, colored substances, fluorane, sensitiveness, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenolsulfonphthalein (Phenol Red). Description, solubility, identification, loss on drying, ash, arsenic, insoluble substances, sensitiveness, and storage. U.S.P. product of phenolsulfonphthalein—Injectio Phenolsulfonphthaleini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenyl Salicylate (Salol). Description, solubility, melting point, identification, loss on drying, ash, free acid, free phenol or salicylic acid, chloride, sulfate, and storage.

Reference.—Creosote, medicinal agent, *see* 801,3: betanaphthol, naphthalene, medicinal agents, *see* 801.4; carbolic acid, benzoic acid, salicylic acid, acetylsalicylic acid, pyrogallic acid, picric acid, as medicinal agents, *see* 802.1; aniline, acetanilid, as medicinal agents, *see* 802.2; indigo, as medicinal agent, *see* 803.11.

803.3 EXPLOSIVES

References.—Explosives, fireworks and ammunition, *see* 860-869.

803.31 Picric Acid

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-2A; 1938. Acid; Picric, Trinitrophenol.

References.—Picric Acid as a medicinal and as a chemical reagent, *see* 802.1.

803.32 Trinitrotoluol

U. S. Gov., Navy Dept. Specification 51T2b; 1941. Trinitrotoluol.

U. S. Gov., U. S. Army, ordnance Dept. Specification 50-13-5C; 1942. Trinitrotoluene.

803.33 Ammonium Picrate

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-3C; 1938. Ammonium Picrate; Explosive D.

803.34 Tetryl

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-4C; 1942. Tetryl.

803.35 Dinitrotoluene

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-10B; 1941. Dinitrotoluene, DNT.

803.4 COAL-TAR DIPS AND DISINFECTANTS

American Hospital Assn., 16-7. Coal Tar Disinfectant (Emulsifying Type). Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Commercial Standard CS70-38 for Coal-Tar disinfectant (Emulsifying Type), referred to below.

American Hospital Assn., 16-10. Cresylic Disinfectants. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Commercial Standard CS71-38 for Cresylic Disinfectants, referred to below.

References.—Miscellaneous disinfectants, *see* 881.9.

809. MISCELLANEOUS COAL-TAR PRODUCTS

809.1 SYNTHETIC TANNING MATERIALS

American Leather Chemists Assn. Methods of Sampling and Analysis, 1938. Includes vegetable materials containing tannin, chrome tanning materials, beam house liquors, and miscellaneous tannery materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T316; 1926. Analysis of Synthetic Tanning Materials. Methods found most satisfactory and reliable at the Bureau for the determination of acidity, total sulphur, total inorganic matter, free sulphuric acid and sulphates, nonvolatile matter, total organic matter, and tanning material.

References.—Vegetable and other tanning materials and methods of test and analysis, *see* 231.

809.2 INK POWDER

References.—Iron gallotannate ink powder, *see* 933.1.

809.3 PHOTOGRAPHIC DEVELOPER, METAL

U. S. Gov., Federal Specification O-M-571; 1931. Mono-Methyl-Paraminophenol Sulfate (Metol). Covers one grade. Gives requirements for solubility; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-4; 1923. Acrol; Diamidophenol.

810-819 MEDICINAL AND PHARMACEUTICAL PREPARATIONS

810. GENERAL ITEMS

American Drug Manufacturers Assn. Proceedings, 1944. Physical Tests and Standards. Establishes reference melting point standards in order to largely eliminate the difficulties many laboratories have encountered with melting point determinations. Gives tables showing extensive data for vanillin, acetanilid, acetophenetidin, sulfanilamide, sulfapyridine, and caffeine.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Includes brief definitions of drugs and medicinal substances according to the tenets of homoeopathy; describes preparation processes of bringing crude drugs to the fluid and dry forms; gives requirements for forms of vehicles for prescription; includes practices in the writing of prescriptions; includes standards for the purity and quality of vegetable drugs; and lists several hundred drugs, mostly plant drugs, gives names and synonyms, description of plant, its habitat, the part used for drug purposes, the methods of preparation and standard strengths of tinctures, dilutions, medications, triturations, etc., as used in homoeopathic medicine.

American Medical Assn., Council on Pharmacy and Chemistry. New and Nonofficial Remedies, 1941. Contains a descriptive list of the proprietary drugs and medicines with the name of the manufacturers, such articles having met the rules of the American Medical Assn. as regards giving compositions and identification tests, absence of advertising, absence of unwarranted therapeutic claims, etc. The listing of an article does not imply a recommendation by the American Medical Assn. Does not contain articles given in U. S. Pharmacopoeia.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Radioactivity of Foods and Drugs. Official method for determining the presence of radioactivity in clear solutions of drugs and waters and method for determining the amount of radium present.

National Tuberculosis Assn. and the American Trudeau Society. Diagnostic Standards and Classification of Tuberculosis, 1940. Covers statement of principles relating to diagnosis of tuberculosis and technical procedures for making tests.

Technical Assn. of the Pulp and Paper Industry. Preparation of Liquid Analytical Reagents, Standard T 606 m-36; 1936. Requires use of commercially pure chemicals, distilled water, neutral to litmus paper unless otherwise stated, filtered unless perfectly clear or otherwise required; includes acids and other liquids ordinarily needed in a paper manufacturing laboratory.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H23; 1938. Radium Protection.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H27; 1941. Safe Handling of Radioactive Luminous Compound.

U. S. Gov., Federal Specification U-M-186; 1944. Medicinal Products and Clinical Laboratory Reagents; General Specification for Containers (Packaging and Packing). Gives requirements for types and classes, grades and sizes, material, workmanship, labeling, compatibility of container, and details for glass, metal, fiber, paper, plastic, and wood containers; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51C21a; 1935. Chemicals; Testing, Boiler-Water.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1053A; 1941. Drugs, Chemicals and Reagents, New and Nonofficial Remedies Quality.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1113; 1941. Drugs and Chemicals, National Formulary.

References.—Medical and surgical supplies for ships, standard list, *see* 915.50.

811. ALKALOIDS AND SALTS

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Apomorphin Hydrochlorid, Atropine, Atropine Sulfate, Berberine, Brucine, Caffeine, Cinchonin Sulfate, Cocaine Hydrochlorid, Codeine, Eserine, Hydrastine, Hyoscyamin Sulfate, Morphine, Morphine Acetate, Morphine Hydrochlorid, Morphine Sulfate, Narceine, Narcotine, Pilocarpin Hydrochlorid, Pilocarpin Nitrate, Quinin Arsenate, Quinin Arsenite, Quinin Hydrochlorid, Quinin Sulfate, Quinine, Sparteine Sulphate, Strychnine Arsenate, Strychnine Nitrate, Strychnine Phosphate, and Strychnine Sulfate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Bebeerin Sulfate, Opium, and Veratrine. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Ephedrine Sulfate. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Procaine Hydrochloride. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Quinine and Urea Hydrochloride. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Quinine Dihydrochloride. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Arecoline Hydrobromide. Gives chemical composition, description, solubility, melting point, identifications, loss and drying, ash, acidity, sulfate, other alkaloids, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Brucine Sulfate. Gives chemical composition, description, solubility, identifications, loss on drying, ash, acidity, strychnine, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cinchonidine Sulfate. Gives chemical composition, description, solubility, optical rotation, identifications, loss on drying, ash, carbonizable substances, reaction, cinchonine and quinidine sulfates, quinine or quinidine, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cinchonine Sulfate. Gives chemical composition, description, solubility, optical rotation, identification, loss on drying, ash, carbonizable substances, reaction, distinction from cinchonidine and quinine, quinine sulfate and cinchonidine sulfate, quinine or quinidine, distinction from quinine and quinidine, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cotarnine Chloride. Gives chemical composition, description, solubility, identifications, loss on drying, ash, reaction, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Hydrastine Hydrochloride. Gives chemical composition, description, solubility, identifications, loss on drying, ash, reaction, hydrastinine, berberine, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Jelly of Ephedrine Sulfate. Gives chemical composition, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Morphine Hydrochloride. Gives chemical composition, description, solubility, identifications, loss on drying, ash, free acid, ammonium salts, apomorphine, meconate, foreign alkaloids, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Papaverine Hydrochloride. Gives chemical composition, description, solubility, identifications, loss on drying, ash, reaction, cryptopine, thebaine, or other organic impurities, morphine, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pilocarpine Hydrochloride. Gives chemical composition, description, solubility, melting point, identifications, loss on drying, reaction, ash, carbonizable impurities, other alkaloids, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Quinine. Gives chemical composition, description, solubility, optical rotation, identifications, loss on drying, ash, reaction, ammonium salts, other cinchona alkaloids, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Quinine Hydrobromide. Gives chemical composition, description, solubility, identifications, loss on drying, ash, carbonizable impurities, reaction, sulfate, barium, inorganic salts, other cinchona alkaloids, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Quinine Phosphate. Gives chemical composition, description, solubility, identifications, carbonizable impurities, reaction, chloride, sulfate, other cinchona alkaloids, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Quinine Salicylate. Gives chemical composition, description, solubility, identifications, loss on drying, ash, reaction, chloride, sulfate, other cinchona alkaloids, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ephedrine Sulfate. Gives chemical composition, preparation, description, optical rotation, identifications, reaction, assay, storage, and average dilution for use on mucous membranes.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Methylrosaniline Chloride (Solution of Crystal Violet). Gives chemical composition, description, residue, storage, alcohol content, external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Nux Vomica Alkaloids. Gives chemical composition, description, identifications, reactions, assay for total alkaloidal salts and for strychnine sulfate and brucine sulfate, storage, average dose (metric or apothecaries) for horses and cattle and for sheep and swine, based on weight of the animal, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Procaine Hydrochloride. Gives chemical composition, description, identifications, assay, storage, preparation, and average parenteral dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sparteine Sulfate. Gives chemical composition, description, solubility, identifications, reaction, loss on drying, ash, carbonizable impurities, ammonium salts, aniline, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Strychnine. Gives chemical composition, description, solubility, identifications, ash, carbonizable impurities, reaction, brucine, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Strychnine Nitrate. Gives chemical composition, description, solubility, optical rotation, identifications, ash, free acid, chloride, sulfate, brucine, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Strychnine Phosphate. Gives chemical composition, description, solubility, identifications, carbonizable impurities, reaction, chloride, sulfate, brucine, assay, storage, preparation, and average dose.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Acetanilid and Caffeine. Preparation of reagents and of solution of sample; tentative methods for determination of caffeine and of acetanilid.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Acetanilid, Caffeine, and Codeine. Tentative Methods. Preparation of sample; determination of amount of each of above constituents.

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Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Diacetylmorphine (Heroin) in Tablets. Tests for identity and purity.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Emetine Hydrochloride in Tablets. Tentative method for determination of amount of emetine hydrochloride.

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U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Apomorphine Hydrochloride. Description, solubility, identification, ash, reaction, decomposition products, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Atropine. Description, solubility, melting point, identification, ash, carbonizable substances, other alkaloids, apoatropine or belladonnine, and storage. U.S.P. product of atropine—Atropinae Sulfas, Tabellae Atropinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Atropine Sulfate.

Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, other alkaloids, apoatropine or belladonnine, and storage. U.S.P. product of atropine sulfate—Tabellae Atropinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Atropine Sulfate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Belladonna Leaf (Deadly Nightshade Leaf). Description, assay, and storage. U.S.P. products of belladonna leaf—Atropina, Atropinae Sulfas, Extractum Belladonnae, Tabellae Atropinae Sulfatis, Tinctura Belladonnae, Unguentum Belladonnae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Belladonna Ointment. Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Belladonna Plaster. Description, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Belladonna Root (Deadly Nightshade Root). Description, assay, and storage. U.S.P. product of belladonna root—Emplastrum Belladonnae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Caffeine. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, heavy metals, other alkaloids, and storage. U.S.P. products of caffeine—Caffeina Citrata, Caffeinaet Sodii Benzoas, Injectio Caffeinae et Sodii Benzoatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Caffeine and Sodium Benzoate. Description, solubility, identification, loss on drying, carbonizable substances, reaction, chlorinated compounds, heavy metals, assay for caffeine, assay for sodium benzoate, and storage. U.S.P. product of caffeine and sodium benzoate—Injectio Caffeinae et Sodii Benzoatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chrysarobin. Description, solubility, identification, ash, reaction, and storage. U.S.P. product of chrysarobin—Unguentum Chrysarobini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chrysarobin Ointment. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Citrated Caffeine. Description, solubility, melting point, identification, loss on drying, ash, reaction, sulfate, tartrate, heavy metals, assay for caffeine, assay for citric acid, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cocaine. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, cinnamyl-cocaine and other reducing substances, isoatropyl-cocaine, and storage. U.S.P. product of cocaine—Cocainae Hydrochloridum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cocaine Hydrochloride. Description, solubility, optical rotation, identification, loss on drying, ash, carbonizable substances, acidity, cinnamyl-cocaine and other reducing substances, isoatropyl-cocaine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Codeine. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, morphine, and storage. U.S.P. products of codeine—Codeinae Phosphas, Codeina Sulfas, Tabellae Codeinae Phosphatis, Tabellae Codeinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Codeine Phosphate. Description, solubility, identification, reaction, chloride, sulfate, morphine, assay, and storage. U.S.P. product of codeine phosphate—Tabellae Codeinae Phosphatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Codeine Phosphate Tablets. Identification, morphine, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Codeine Sulfate. Description, solubility, identification, loss on drying, ash, carbonizable substances, free acid, morphine, and storage. U.S.P. product of codeine sulfate—Tabellae Codeinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Codeine Sulfate Tablets. Identification, morphine, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Colchicine. Description, solubility, melting point, identification, loss on drying, ash, chloroform, colchiceine, and storage. U.S.P. product of colchicine—Tabellae Colchicinae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Colchicine Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emetine Hydrochloride. Description, solubility, identification, loss on drying, ash, carbonizable substances, free acid, cephaeline, and storage. U.S.P. product of emetine hydrochloride—Injectio Emetinae Hydrochloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emetine Hydrochloride Injection (Emetine Hydrochloride Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ephedrine. Description, solubility, melting point, optical rotation, identification, ash, reaction, chloride, sulfate, assay, labeling, and storage. U.S.P. products of ephedrine—Ephedrinae Hydrochloridum, Ephedrinae Sulfas, Tabellae Ephedrinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ephedrine Hydrochloride. Description, solubility, melting point, optical rotation, identification, loss on drying, ash, reaction, sulfate, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ephedrine Sulfate. Description, solubility, optical rotation, identification, loss on drying, ash, reaction, chloride, assay, and storage. U.S.P. product of ephedrine sulfate—Tabellae Ephedrinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ephedrine Sulfate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Epinephrine. Description, solubility, optical rotation, identification, loss on drying, ash, reaction, vegetable alkaloids, and storage. U.S.P. products of epinephrine—Injectio Epinephrinae Hydrochloridi, Liquor Epinephrinae Hydrochloridi, Nebula Epinephrinae Hydrochloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Epinephrine Hydrochloride Injection (Epinephrine Hydrochloride Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Epinephrine Hydrochloride Spray (Solution of Epinephrine Hydrochloride). Description, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ergonovine Maleate. Description, solubility, melting point, optical rotation, identification, loss on drying, ergotoxine and ergotamine, assay, and storage. U.S.P. Product of ergonovine maleate—Tabellae Ergonovinae Maleatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ergonovine Maleate Tablets. Identification, foreign alkaloids and ergotamine, ergotoxine and ergotamine, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ergot. Description, identification, purity, assay, and storage. U.S.P. products of ergot—Ergonovinae Maleas, Ergotaminae Tartras, Fluidextractum Ergotae, Tabellae Ergonovinae Maleatis, Tabellae Ergotaminae Tartratis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ergotamine Tartrate. Description, solubility, melting point, optical rotation, identification, foreign substances, and storage. U.S.P. product of ergotamine tartrate—Tabellae Ergotaminae Tartratis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ergotamine Tartrate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethylmorphine Hydrochloride. Description, solubility, melting point, identification, loss on drying, ash, reaction, ammonium compounds, morphine, distinction from codeine hydrochloride, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Eucaine Hydrochloride (Betaeucaine Hydrochloride). Description, solubility, identification, loss on drying, cocaine hydrochloride, ash, carbonizable substances, reaction, cocaine and alphaeucaine, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Eucatropine Hydrochloride. Description, solubility, melting point, identification, ash, reaction, atropine, scopolamine or hyoscyamine, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Belladonna—Pilular Extract of Belladonna. Preparation and assay. Powdered Extract of Belladonna. Preparation and assay. U.S.P. products of extract of belladonna—Unguentum Belladonnae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glyceryl Triacetate (Triacetin). Description, solubility, specific gravity, distillation range, refractive index, identification, moisture, free acid, unsaturated compounds, saponification value, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Homatropine Hydrobromide. Description, solubility, melting point, identification, loss on drying, ash, reaction, atropine, hyoscyamine or scopolamine, most other alkaloids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Hyoscyamus (Henbane). Description and assay. U.S.P. products of hyoscyamus—Extractum Hyoscyami (Pilular and Powdered), Tinctura Hyoscyami.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ipecac. Description and assay. U.S.P. products of ipecac—Fluidextractum Ipecacuanhae Syrupus Ipecacuanhae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theobromine and Sodium Acetate. Description, solubility, identification, reaction, alkalinity, color and completeness of solution, caffeine, assay, and storage. U.S.P. product of theobromine and sodium acetate—Capsulae Theobrominae et Sodii Acetatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline. Description, solubility, melting point, identification, loss on drying, ash, reaction, carbonizable substances (difference from caffeine, theobromine, or paraxanthine), and storage. U.S.P. product of theophylline—Tabellae Theophyllinae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline Ethylenediamine (Aminophylline). Description, solubility, identification, ash, reaction, assay for theophylline, assay for ethylenediamine, and storage. U.S.P. products of theophylline ethylenediamine—Injectio Theophyllinae Aethylenediaminicae, Tabellae Theophyllinae Aethylenediaminicae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline Ethylenediamine Injection (Theophylline Ethylenediamine Ampuls, Aminophylline Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline Ethylenediamine Tablets (Aminophylline Tablets). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline and Sodium Acetate (Theophylline with Sodium Acetate). Description, solubility, identification, reaction, limit of caffeine, assay, and storage. U.S.P. product of theophylline and sodium acetate—Tabellae Theophyllinae et Sodii Acetatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline and Sodium Acetate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Opium (Laudanum, Tincture of Deodorized Opium). Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Stramonium. Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Totaquine. Description, solubility, identification, loss on drying, ash, assay for quinine and cinchonidine, assay for quinidine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Urea (Carbamide). Description, solubility, melting point, identification, ash, reaction, chloride, sulfate, alcohol-insoluble matter, heavy metals, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Menthol. Description, solubility, melting point, identification, wax, paraffin or inorganic substances, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mersalyl and Theophylline Injection (Mersalyl and Theophylline Ampuls). Identification, reaction, mercuric ion, assay for mercury, assay for theophylline, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Methenamine Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Methylrosaniline Chloride (Gentian Violet, Methyl Violet, Crystal Violet). Description, solubility, identification, loss on drying, ash, arsenic, lead, dextrin, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Methylthionine Chloride (Methylene Blue). Description, solubility, identification, loss on drying, ash, arsenic, copper or zinc, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Morphine Sulfate. Description, solubility, identification, loss on drying, ash, free acid, meconate, ammonium salts, foreign alkaloids, and storage. U.S.P. product of morphine sulfate—Tabellae Morphinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Morphine Sulfate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neoarsphenamine. Description, solubility, identification, loss on drying, completeness of solubility, thermo-stability, assay for arsenic, storage, and labeling.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neocinchophen. Description, solubility, melting point, identification, loss on drying, ash, cinchophen, and storage. U.S.P. product of neocinchophen—Tabellae Neocinchopheni.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neocinchophen Tablets. Identification, cinchophen, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nux Vomica. Description and assay. U.S.P. products of nux vomica—Strychninae Sulfas, Tabellae Strychninae Sulfatis, Tinctura Nucis Vomicae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ouabain. Description, solubility, melting point, optical rotation, identification, loss on drying, ash, reaction, alkaloids, and storage. U.S.P. product of ouabain—Injectio Ouabaini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ouabain Injection (Ouabain Ampuls). Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pamaquine Naphthoate (Aminoquin Naphthoate). Description, solubility, identification, loss on drying, assay for methylene, assay for pamaquine base, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pelletierine Tannate. Description, solubility, identification, ash, carbonizable substances, reaction, foreign alkaloids, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenacaine Hydrochloride. Description, solubility, melting point, identification, loss on drying, ash, acetophenetidin, reaction, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenolsulfonphthalein Injection (Phenolsulfonphthalein Ampuls). Identification, sensitiveness, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Physostigmine Salicylate (Eserine Salicylate). Description, solubility, identification, loss on drying, ash, reaction, carbonizable substances, sulfate, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Picrotoxin (Cocculin). Description, solubility, melting point, identification, ash, reaction, alkaloids, and storage. U.S.P. product of picrotoxin—Injectio Picrotoxini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Picrotoxin Injection. Identification, limit of sodium chloride, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pilocarpine Nitrate. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, chloride, various foreign alkaloids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Procaine

Hydrochloride (Procaine). Description, solubility, melting point, identification, difference from cocaine, loss on drying, ash, reaction, carbonizable substances, heavy metals, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinacrine Hydrochloride (Mepacrine Hydrochloride). Description, solubility, identification, loss on drying, ash, hydrogen-ion concentration, assay, and storage. U.S.P. product of quinacrine hydrochloride—Tabellae Quinacrinae Hydrochloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinacrine Hydrochloride Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmocopoeia of U. S. A., Twelfth Revision, 1942. Quinidine Sulfate. Description, solubility, identification, loss on drying, ash, carbonizable substances, reaction, ammonium or other inorganic salts, other cinchona alkaloids, and storage. U.S.P. product of quinidine sulfate—Tabellae Quinidinae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinidine Sulfate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine and Urea Hydrochloride. Description, solubility, identification, ash, carbonizable substances, reaction, ammonium compounds, other cinchona alkaloids, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Bisulfate (Quinine Acid Sulfate). Description, solubility, identification, loss on drying, ash, carbonizable substances, reaction, ammonium salts, other cinchona alkaloids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Dihydrochloride. Description, solubility, identification, loss on drying, ash, carbonizable substances, sulfate, barium, other cinchona alkaloids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Ethylcarbonate (Euquinine). Description, solubility, melting point, identification, loss on drying, ash, reaction, chloride, sulfate, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Hydrochloride and Ethyl Carbamate Injection (Quinine-Urethane Injection). Identification, assay for quinine hydrochloride, assay for ethyl carbamate, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Hydrochloride. Description, solubility, identification, loss on drying, ash, carbonizable substances, reaction, sulfate, inorganic salts, barium, other cinchona alkaloids, and storage. U.S.P. product of quinine hydrochloride—Injectio Quininae Hydrochloridi et Aethylis Carbamatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Sulfate. Description, solubility, identification, loss on drying, ash, carbonizable substances, reaction, inorganic salts, other cinchona alkaloids, and storage. U.S.P. product of quinine sulfate—Tabellae Quininae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Sulfate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Scopolamine Hydrobromide (Hyoscine Hydrobromide). Description, solubility, melting point, optical rotation, identification, loss on drying, ash, reaction, apoatropine, other foreign alkaloids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Epinephrine Hydrochloride. Description, identification, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Stramonium (Jimson Weed, Jamestown Weed). Preparation, description, and assay. U.S.P. products of stramonium—Extractum Stramonii (Pilular and Powdered), Tinctura Stramonii.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strophanthin. Description, solubility, identification, ash, reaction, assay, and storage. U.S.P. product of strophanthin—Injectio Strophanthini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strophanthin Injection (Strophanthin Ampuls). Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strychnine Sulfate. Description, solubility, identification, loss on drying, ash, carbonizable substances, free acid, brucine, and storage. U.S.P. product of strychnine sulfate—Tabellae Strychninae Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strychnine Sulfate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theobromine and Sodium Acetate Capsules. Identification, assay, storage, and sizes.

References.—Food and Drug Act and Regulations, *see* 810; powdered extracts of alkaloids, *see* 819.1.

812. BIOLOGICAL MEDICINALS

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Commission on Standardization of Biological Stains certifies dyes which are most suitable for preparing these solutions. Staining Solutions. Gives formulas for acid fuchsin solution, alcoholic eosin solution, aqueous eosin solution, aqueous methylene blue solution, basic fuchsin solution, Bismarck brown solution, Delafield's hematoxylin solution, Ehrlich's aniline gentian violet solution, Heidenhain's hematoxylin solution, hematoxylin and eosin solution, Hucker's gentian violet solution, iodine water, Loeffler's alkaline methylene blue solution, Mallory's stain, Mayer's hemalum solution, Nicolle carbol-gentian violet solution, neutral red solution, Pappenheim's methyl green-pyronin solution, safranin solution, Stirling's gentian violet solution, and Ziehl-Neelsen carbol-fuchsin solution.

American Veterinary Medical Assn. Biological Products, 1944. Discusses biological products and lists biological products classified as acceptable including antitoxins, serums, aggressins, diagnostics, toxoids, vaccines and viruses, and bacterins.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Antimeningococcic Serum (Antimeningococcus Serum, Meningococcus Serum, Meningitis Serum). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Antipneumococcic Serum, Type Specific (Antipneumococcus Serum, Pneumonia Serum). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bacterial Vaccine Made From the Typhoid Bacillus and the Paratyphoid "A" and "B" Bacilli (Typhoid Combined Vaccine, Typhoid-Paratyphoid Combined Vaccine, Mixed Enteric Vaccine). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bacterial Vaccine Made From the Typhoid Bacillus (Typhoid Prophylactic, Enteric Vaccine, Typhoid Vaccine). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diphtheria Antitoxin. Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diphtheria Toxin for the Schick Test (Schick Test Toxin). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diphtheria Toxoid, Alum Precipitated (Refined Diphtheria Toxoid). A turbid, white, slightly gray, or slightly pink, suspension prepared by adding a sterile aqueous solution of alum to diphtheria toxoid; and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diphtheria Toxoid (Diphtheria Anatoxin, Anatoxin—Ramon). A sterile aqueous solution of the products of growth of the diphtheria bacillus, description, and regulations.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Human Measles Immune Serum (Measles Convalescent Serum). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Human Scarlet Fever Immune Serum (Scarlet Fever Convalescent Serum). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Normal Human Serum (Human Serum). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Old Tuberculin (Concentrated Tuberculin, Crude Tuberculin). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Rabies Vaccine (Pasteur Treatment, Pasteur Prophylactic). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Scarlet Fever Streptococcus Antitoxin. Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Scarlet Fever Streptococcus Toxin (Scarlet Fever Toxin for Immunization and for the Dick Test). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Small Pox Vaccine. Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tetanus Antitoxin. Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tetanus Toxoid. A sterile solution of the products of growth of the tetanus bacillus, description, and regulations.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tetanus Toxoid, Alum Precipitated (Refined Tetanus Toxoid). A turbid white or slightly gray suspension prepared by adding a sterile aqueous solution of alum to tetanus toxoid; and storage.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1072; 1939. Stains; Biological.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1073B; 1940. Biological Products; Medical.

References.—Biological stains, *see* 803.19; Food and Drug Act and Regulations, *see* 810; standard list of vaccines and antitoxins for ship medical supplies, *see* 915.50.

813. MEDICINAL OILS

813.1 CASTOR OIL

American Institute of Homoeopathy. Homeopathic Pharmacopoeia of U. S., 1941. Castor Oil. Synonyms, description, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aromatic Castor Oil. Gives chemical composition, storage, alcohol content, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Castor Oil. Description, solubility, specific gravity, distinction from most other fixed oils, saponification value, iodine value, acid value, and storage.

References.—Food and Drug Act and Regulations, *see* 810.

813.2 COD LIVER OIL

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U.S., 1941. Cod Liver Oil. Class, order, family, synonyms, and description.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Cod Liver Oil With Egg. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Cod Liver Oil With Hypophosphites. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Cod Liver Oil With Malt. Gives chemical composition, preparation, storage, and average dose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cod Oil and Cod Liver Oil. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

References.—Food and Drug Act and Regulations, *see* 810, 042.2.

813.3 COTTONSEED OIL

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cottonseed Oil (Cotton Seed Oil). Description, solubility, specific gravity, congealing temperature, identification, saponification value, iodine value, solidification temperature of the fatty acids, and storage.

References.—Food and Drug Act and Regulations. *see* 810; cottonseed oil for other than medical purposes, *see* 142.4.

813.4 OIL OF ALMONDS

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Expressed Almond Oil (Oil of Sweet Almond). Description, solubility, specific gravity, congealing temperature, foreign kernel oils, sesame, cottonseed oil, mineral oil and foreign fatty oils, foreign oils, saponification value, iodine value, and storage.

U.S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Oil of Bitter Almond (Bitter Almond Oil). Description, solubility, specific gravity, optical rotation, refractive index, reaction, heavy metals, halogens, nitrobenzene, assay of benzaldehyde, assay of hydrogen cyanide, and storage.

References.—Food and Drug Act and Regulations, *see* 810.

813.5 LINSEED OIL

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Linseed Oil (Oil of Flaxseed, Raw Linseed Oil). Description, solubility, specific gravity, nondrying oils, mineral or rosin oil, rosin or rosin oils, unsaponifiable matter, saponification value, iodine value, acid value, and storage.

References.—Food and Drug Act and Regulations, *see* 810; linseed oil for paints, *see* 848.11, 848.12.

813.6 OLIVE OIL

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Olive Oil (Sweet Oil). Description, solubility, specific gravity, cottonseed oil, peanut oil, sesame oil, teaseed oil, saponification value, iodine value, acid value, solidification temperature of fatty acids, and storage.

References.—Food and Drug Act and Regulations, *see* 810; olive oil for food purposes, *see* 142.5.

813.7 SESAME OIL

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sesame Oil (Teel or Benne Oil). Gives description, miscibility, specific gravity, identification, free acid, cottonseed oil, saponification value, iodine value, storage, and preparation.

References.—Food and Drug Act and Regulations, *see* 810; sesame oil for food purposes, *see* 142.8.

813.8 THEOBROMA OIL

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theobroma Oil (Cacao Butter, Cocoa Butter, Oil of Theobroma). Description, solubility, melting point, specific gravity, refractive index, wax, stearin, tallow, saponification value, iodine value, solidification temperature of the fatty acids, and storage.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1083; 1939. Oil; Theobroma Sticks.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1110; 1940. Oil; Theobroma, Modified.

References.—Food and Drug Act and Regulations, *see* 810; cacao butter, food products, *see* 142.93.

813.9 MISCELLANEOUS MEDICINAL OILS

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Animal Oil, Coal Oil, Croton Oil, Eupion, Oil of Cajaput, Oil of Santal, and Oil of Turpentine. Synonym, description, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Croton Oil. Gives description, miscibility, specific gravity, identification, foreign oils, reaction, saponification value, iodine value, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ethereal Oil. Gives chemical composition, description, reaction, specific gravity, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Bergamot. Gives chemical composition, description, miscibility, specific gravity, optical rotation, reaction, fixed oil, chlorinated compounds, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Bitter Orange. Gives description, miscibility, specific gravity, optical rotation, identification, reaction, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Caraway. Gives chemical composition, description, miscibility, specific gravity, optical rotation, refractive index, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Cardamom. Gives description, miscibility, specific gravity, optical rotation, reaction, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Myrcia (Oil of Bay). Gives chemical composition, description, miscibility, specific gravity, optical rotation, identifications, reaction, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Orange Flowers (Oil of Neroli). Gives description, miscibility, specific gravity, optical rotation, identification, reaction, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Pimenta (Oil of Allspice). Gives chemical composition, description, miscibility, specific gravity, optical rotation, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Santal (Sandalwood Oil). Gives chemical composition, description, miscibility, specific gravity, optical rotation, refractive index, reaction, assay for esters and for alcohols, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oil of Thyme. Gives chemical composition, description, miscibility, specific gravity, optical rotation, water-soluble phenols, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phenolated Oil (Carbolized Oil or Oleum Carbolatum). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phosphorated Oil. Gives chemical composition, description, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Rectified Oil of Birch Tar. Gives description, miscibility, specific gravity, identification, juniper tar, storage, and preparation.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Chaulmoogra Oil. Tentative method of test for solubility in alcohol; determination of viscosity and determination of acid and iodine numbers of alcohol-soluble portion, using methods of U. S. Pharmacopoeia.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Oil of Chenopodium. Tentative method for determining amount of ascaridole.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Turpentine Oil (Spirits of Turpentine). Tentative method for determination of color, specific gravity, refractive index, distillation, mineral oil in turpentine.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Allyl Isothiocyanate (Mustard Oil). Description, solubility, specific gravity, refractive index, identification, reaction, alcohol, chloroform, petroleum, fatty oils, phenols, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Camphor Liniment (Camphorated Oil). Preparation, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia or U. S. A., Twelfth Revision, 1942. Chaulmoogra Oil (Hydnocarpus Oil). Description, solubility, specific gravity, optical rotation, castor oil or free fatty acids, saponification value, iodine value, acid value, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Spirit of Orange. Preparation, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Tincture of Lavender (Compound Spirit of Lavender). Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emulsion of liquid Petrolatum (Mineral Oil Emulsion). Description.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emulsion of Oil of Turpentine. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Eucalyptol. Description, solubility, specific gravity, congealing point, boiling range, optical rotation, refractive index, identification, reaction, phenols, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Eugenol. Description, solubility, specific gravity, refractive index, boiling point, hydrocarbons, phenol, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iodized Oil. Description, solubility, identification, ash, free acid, assay for iodine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Juniper Tar (Oil of Cade, Oleum Juniperi Empyreumaticum). Description, solubility, specific gravity, identification, reaction, rosin or rosin oils, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Anise (Anise Oil). Description, solubility, specific gravity, congealing temperature, optical rotation, refractive index, heavy metals, phenols, and storage. U.S.P. products of oil of anise—Aqua Anisi, Spiritus Anisi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Ceder Leaf (Oil and Arbor Vitae, Oil of Thuja). Description, solubility, specific gravity, optical rotation, refractive index, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Chenopodium (Oil of American Wormseed). Description, solubility, specific gravity, optical rotation, refractive index, heavy metals, assay, and storage. U.S.P. product of oil of chenopodium—Capsulae Olei Chenopodii.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Chenopodium Capsules (Oil of American Wormseed Capsules). Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Cinnamon (Oil of Cassia). Description, solubility, specific gravity, optical rotation, refractive index, reaction, heavy metals, halogens, rosin or rosin oils, assay for total aldehydes, and storage. U.S.P. products of oil of cinnamon—Aqua Cinnamomi, Spiritus Cinnamomi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Clove (Oil of Cloves). Discription, solubility, specific gravity, optical rotation, refractive index, reaction, heavy metals, phenol, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Coriander (Coriander Oil). Description, solubility, specific gravity, optical rotation, refractive index, heavy metals, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Dwarf Pine Needles (Pine Needle Oil). Description, solubility, specific gravity, optical rotation, distillation limits, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Eucalyptus (Eucalyptus Oil). Description, solubility, specific gravity, congealing temperature, refractive index, reaction, heavy metals, phellandrene, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Fennel (Fennel Oil). Description, solubility, specific gravity, congealing temperature, optical rotation, refractive index, heavy metals, reaction, and storage. U.S.P. product of oil of fennel—Aqua Foeniculi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Juniper (Juniper Oil). Description, solubility, specific gravity, optical rotation, refractive index, reaction, heavy metals, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Lavender (Oil of Lavender Flowers). Description, solubility, specific gravity, optical rotation, refractive index, alcohol, esters, assay, and storage. U.S.P. products of oil of lavender—Spiritus Lavandulae, Tinctura Lavandulae Composita.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Lemon (Lemon Oil). Description, solubility, specific gravity, optical rotation, refractive index, reaction, foreign oils, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Myristica (Myristica Oil, Oil of Nutmeg). Description, solubility, specific gravity, optical rotation, refractive index, residue, reaction, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Orange (Orange Oil, Oil of Sweet Orange). Description, solubility, specific gravity, optical rotation, refractive index, reaction, heavy metals, washed citrus oils, foreign oils, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Peppermint (Peppermint Oil). Description, specific gravity, optical rotation, refractive index, reaction, dementholized or impure peppermint oil, dimenthyl sulfide found in unrectified peppermint oils, distinction from oil of mentha arvensis, assay for esters, assay for total menthol, and storage. U.S.P. products of oil of peppermint—Aqua Menthae Piperitae, Spiritus Menthae Piperitae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Rose (Otto of Rose). Description, solubility, specific gravity, optical rotation, refractive index, and storage. U.S.P. products of oil of rose—Aqua Rosae, Aqua Rosae Fortior.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Rosemary (Rosemary Oil). Description, Solubility, specific gravity, optical rotation, refractive index, assay for esters, assay for total borneol, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Sassafras (Sassafras Oil). Description, solubility, specific gravity, optical rotation, refractive index, reaction, heavy metals, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Spearmint (Spearmint Oil). Description, solubility, specific gravity, optical rotation, refractive index, reaction, assay, and storage. U.S.P. products of oil of spearmint—Aqua Menthae Viridis, Spiritus Menthae Viridis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oil of Turpentine (Turpentine Oil, "Spirits of Turpentine"). Description, solubility, specific gravity, optical rotation, refractive index, reaction, distillation range, fixed oil, mineral oil, mineral or rosin oils, other foreign substances, and storage. U.S.P. product of oil of turpertine—Oleum Terebinthinae Rectificatum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Persic Oil (Apricot Kernel Oil, Peach Kernel Oil). Description, solubility, specific gravity, mineral oil, other oils, saponification value, iodine value, solidification temperature, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Rectified Oil of Tar. Description, solubility, specific gravity, reaction, and storage. U.S.P. product of rectified oil of tar—Syrupus Picis Pini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Rectified Oil of Turpentine (Rectified Turpentine Oil). Description, specific gravity, nonvolatile residue, and storage. U.S.P. product of rectified oil of turpentine—Emulsum Olei Terebinthinae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Anise. Preparation, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Cinnamon. Preparation, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Lavender. Preparation, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Peppermint

(Essence of Peppermint). Preparation, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Spearmint. Preparation, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. White Ointment (Unguentum, Ointment, Simple Ointment). Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Yellow Ointment. Preparation.

References.—Turpentine for commercial purposes, *see* 211.1; Food and Drugs Act and Regulations, *see* 810; creosote oil for medicinal purposes, *see* 801.3.

814. IODINE AND ARSENIC

814.1 IODINE

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Iodine. Gives chemical composition and assay.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Iodine and Zinc Iodide (Diluted Talbot's Solution). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phenolated Solution of Iodine (Carbolized Solution of Iodine). Gives chemical composition, description, specific gravity, identification, free iodine, ash, storage, external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Stronger Tincture of Iodine (Churchill's Tincture for Iodine). Gives chemical composition, preparation, assay for potassium iodide and for iodine, alcohol content, and external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Iodides. Gives chemical composition, preparation, alcohol content, and external use.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chiniofon Tablets. Identification, inorganic iodine, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iodine. Description, solubility, identification, nonvolatile residue, chloride or bromide, assay, and storage, U. S. P. products of iodine—Liquor Iodi, Liquor Iodi Fortis, Tinctura Iodi, Tinctura Iodi Mitis, Unguentum Iodi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iodine Ointment. Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iodized Oil. Description, solubility, identification, ash, free acid, assay for iodine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iodophthalein Sodium (Soluble Iodophthalein, Tetraiodophenolphthalein Sodium, Tetraiodophthalein Sodium, Tetiothalein Sodium). Description, solubility, identification, free phthalein, assay for tetraiodophenolphthalein, assay for iodine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mild tincture of Iodine. Description, identification and assays, storage, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Iodide. Description, solubility, identification, loss on drying (iodate, nitrate, thiosulfate, and barium), (nitrite, nitrate, and ammonia), alkalinity, heavy metals, potassium, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Iodine. Description, identification, assay for iodine, assay for sodium iodide, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strong Solution of Iodine (Lugol's Solution). Description, identification, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Thymol Iodide. Description, solubility, identification, loss on drying, ash, soluble halides, alkalies, free iodine, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Iodine. Description, identification, assay, storage, and alcohol content.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1025C; 1938. Iodine and Potassium Iodide.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1031B; 1944. Iodine Swabs.

References.—Iodine for commercial uses, *see* 839.9; Food and Drugs Act and Regulations, *see* 810.

814.2 ARSENIC

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Arsenic Disulfid, Arsenious Iodid, Arsenious Oxid, Arsenious Sulfid, and Metallic Arsenic. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Arsenic Triiodide (Arsenous Iodide). Gives chemical composition, description, solubility, identifications, residue, free iodine, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Arsenic and Mercuric Iodides (Donovan's Solution). Gives chemical composition, description, identifications, assay for arsenic triiodide and for mercuric iodide, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Arsenic Trioxide (Arsenous Acid Tablets). Gives chemical composition, identification, assay, and average dose.

American Standards Assn., Z37.9-1943. Developed by the U. S. Public Health Service. Allowable Concentration of Metallic Arsenic and Arsenic Trioxide (American War Standard). To prescribe the maximum permissible concentration of metallic arsenic and of arsenic trioxide in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Gives properties of arsenic, permissible concentration, sampling procedure, and analytical methods.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Arsenicals. Tentative method for determination of arsenic in iron-arsenic tablets, official methods for determining amount of arsenic in sodium cacodylate, in iron methylarsenates, in arsphenamine and neoarsphenamine.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Arsenic Trioxide (Arsenious Acid, Arsenious Oxide). Description, solubility, identification, loss on drying, residue on ignition, foreign substances, antimony, tin, cadmium, assay, and storage. U.S.P. product of arsenic trioxide—Liquor Acidi Arseniosi, Liquor Potassii Arsenitis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Arsphenamine. Description, solubility, identification, acidity, completeness of solubility, thermostability, assay for arsenic, storage, and labeling.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Carbarsone. Description, solubility, melting point, identification, loss on drying, reaction, arsenate, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neoarsphenamine. Description, solubility, identification, loss on drying, completeness of solubility, thermostability, assay for arsenic, storage, and labeling.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Potassium Arsenite (Fowler's Solution). Description, identification, arsenate, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfarsphenamine. Description, solubility, identification, completeness of solubility, thermostability, assay, storage, and labeling.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tryparsamide. Description, solubility, identification, distinction from sodium cacodylate, loss on drying, reaction, arsenate, arsanilic acid, arsphenamine compounds, assay, storage, and labeling.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-45; 1924. Arsenic Trichloride.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-50; 1924. Arsenic; White.

U. S. Gov., U. S. Army Ordnance Dept. Specification 4-1034; 1931. Arsenic Disulphide (As_2S_2).

References.—Food and Drugs Act and Regulations. *see* 810; arsenic insecticides, *see* 881.1; determination of arsenic in foods, *see* 120; arsenic trioxide, chemical reagent, *see* 839.9.

815. ANESTHETICS

815.1 ETHER

American Chemical Society. Specifications for Analytical Reagents, 1941. Ether. Gives requirements for specific gravity, nonvolatile matter, acid, aldehyde, peroxide, substances darkened by sulfuric acid, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Ether; Absolute. Gives requirements for specific gravity, nonvolatile matter, acid, aldehyde, peroxide, substances darkened by sulfuric acid, and tests.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ether (Ethyl Ether, Diethyl Ether). Description, solubility, specific gravity, boiling point, residue on evaporation, reaction, foreign odor, aldehyde, free acid, peroxide, and storage.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1054; 1937. Ether, for Anesthesia.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-4J; 1943. Ether; U.S.P. XII, for Anesthesia.

References.—Food and Drugs Act and Regulations, *see* 810.

815.2 CHLOROFORM

American Chemical Society. Specifications for Analytical Reagents, 1941. Chloroform. Gives requirements for specific gravity, nonvolatile matter, acetone or aldehyde, acid and chloride, free chlorine, substances darkened by sulfuric acid, and tests.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Chloroform and Carbon Tetrachloride. For chloroform and chloroform mixtures, tentative methods for determining amount of chloroform.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Chloroform in Mixtures. Tentative method for determining amount of chloroform.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chlorobutanol (Chlorobutol, Acetone-Chloroform). Description, solubility, melting point, identification, ash, reaction, chloride, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chloroform. Description, solubility, specific gravity, boiling point, residue or evaporation, carbonizable substances, chloride ion and chlorine, odorous and chlorinated decomposition products, acids and phosgene, aldehydes and ketones, foreign odor, and storage. U.S.P. products of chloroform—Aqua Chloroformi, Linimentum Chloroformi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chloroform Liniment. Preparation, assay, alcohol content, and storage.

U. S. Gov., Treasury Dept., Procurement Div., No. 709; 1944. Chloroform; Technical Grade. Covers one type and one grade. Gives requirements for appearance, odor, specific gravity, nonvolatile matter, spot test, acidity, distillation range, and free chlorine; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-21-19; 1940. Chloroform; Technical.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1008B; 1939. Chloroform; Anesthetic.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-113a; 1941. Chlorofrom, for Anesthesia.

References.—Food and Drugs Act and Regulations, *see* 810.

815.3 ETHYLENE

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethylene. Description, solubility, identification, acids or alkalies, carbon dioxide, acetylene, aldehyde, hydrogen sulfide, phosphine, carbon monoxide, assay, and storage.

816. BOTANICAL MEDICINALS

816.1 ROOTS, RHIZOMES, AND BULBS

816.11 Althea

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Althea Root. Covers definition and characteristics, derivation, constants, uses, grades, packing, and substances.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Althea (Marsh Mallow Root). Description, identification, and storage.

816.12 Aspidium

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aspidium. Description and assay. U.S.P. product of aspidium—Oleoresina Aspidii.

816.13 Gentian

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Yellow Gentian. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Infusion of Gentian. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Gentian. Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Gentian and Iron. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Gentian. Gives preparation of pilular extract and of powdered extract of gentian and the average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract Gentian. Gives alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerinated Elixir of Gentian. Gives chemical composition, storage, alcohol content, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Tincture of Gentian. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Gentian (Gentian Root). Description, identification, moisture, and assay. U.S.P. product of gentian—Tinctura Gentianae Composita.

816.14 Glycyrrhiza

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Mixture of Opium and Glycyrrhiza (Brown's Mixture). Gives chemical composition storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Glycyrrhiza (Elixir of Licorice). Gives chemical composition, storage, alcohol content, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Glycyrrhiza (Extract of Licorice Root, Licorice). Description, insoluble matter, foreign starch, ash, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Glycyrrhiza (Fluidextract of Licorice Root). Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycyrrhiza (Licorice Root). Description. U.S.P. products of Glycyrrhiza—Extractum Glycyrrhizae, Extractum Glycyrrhizae Purum, Fluidextractum Glycyrrhizae, Syrupus Glycyrrhizae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pure Extract of Glycyrrniza (Pure Extract of Licorice Root). Description and storage.

816.15 Rhubarb

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Rhubarb. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Alkaline of Elixir of Rhubarb. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Powder of Rhubarb (Gregory's Powder). Gives chemical composition, description, storage, average dose, and preparation.

The Americam Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Rhubarb. Gives alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mixture of Rhubarb and Soda. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sweet Tincture of Rhubarb. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Rhubarb. Gives chemical composition, preparation, alcohol content, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Tincture of Rhubarb. Preparation and alcohol content. U.S.P. product of aromatic tincture of rhubarb—Syrupus Rhei Aromaticus.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Rhubarb (Powdered Extract of Rhubarb). Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Rhubarb. Description, anthraquinone compounds, emodin and chrysophanic acid, European rhubarbs, assay, and storage. U.S.P. products of rhubarb—Extractum Rhei, Syrupus Rhei Aromaticus, Tinctura Rhei Aromatica.

816.16 Sarsaparilla

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sarsaparilla. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Fluidextract of Sarsaparilla. Gives chemical composition, alcohol content, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Sarsaparilla. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sarsaparilla. Description and storage. U.S.P. products of sarsaparilla—Fluidextractum Sarsaparillae, Syrupus Sarsaparillae Compositus.

816.17 Ginger

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ginger. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions and medications for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ginger. Description, assay for cold-water extractive and assay for ether-soluble extractive. U.S.P. product of ginger—Fluidextractum Zingiberis.

816.18 Snakeroot

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Brazilian Snakeroot, Button Snakeroot, Seneca Snakeroot, Virginia Snakeroot, and White Snakeroot. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Asarum (Canada snake-root or Wild-ginger). Gives chemical composition, description of unground asarum and powdered asarum, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cimicifuga (Black Cohosh or Black Snakeroot). Gives chemical composition, description of unground cimicifuga and powdered cimicifuga, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Senega (Seneca-Snakeroot). Gives chemical composition, description of unground and powdered senega, histology, preparation, and average dose.

816.19 Miscellaneous Roots, Rhizomes, and Bulbs

American Institute of Homeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Aconite, Aconite Root, Adam's Needle, American Arum, American Hellebore, Arnica Montana, Asarabacca, Baneberry, Barberry, Bayberry, Bear's Foot, Bitter Wood, Black Bryony, Black Cohosh, Black Indian Hemp, Blood Root, Blue Cohosh, Blue Flag, Blue Vervain, Burdock, Burnet Saxifrage, Butterfly Weed, Butter Nut, Celandine, Chicory, Christmas Rose, Columbo, Comfrey, Common Arum, Cone Flower, Cotton Plant, Couch Grass, Crosswort, Culver's Root, David's Root, Elecampane, European Pond Lily, False Gromwell, False Unicorn, Flowering Spurge, Fragrant Sumach, Garlic, Ginseng, Golden Seal, Green Dragon, Herb Bennet, Indian Turnip, Ipecac, Jalap, Jamaica Dogwood, Kava Kava, Lady's Slipper, Leopard's Bane, Locust, Male Fern, Marsh-Mallow, May Apple, Meadow Parsnip, Meadow Saffron, Milkweed, Moonseed, Mountain Grape, Mudar, Mugwort, Musk Root, Onion, Pareira, Parsnip, Peony, Pink Root, Pitcher Plant, Poke, Pomegranate, Queen's Delight, Radish, Rhatany, Rush, Sassafras Bark, Sea Holly, Seven Barks, Skunk Cabbage, Sowbread, Spikenard, Spotted Water Hemlock, Spreading Dogbane, Squill, Star Grass, Stone Root, Swamp Milkweed, Sweet Water Lily, Trumpet Weed, Valerian, Vetiver, Wake Robin, Water Dropwort, Water Hemlock, White Bryony, White Fraxinella, White Hellebore, Wild Cranesbill, Wild Ginger, Wild Indigo, Wild Ipecac, Wild Yam, Winged Leaved Paullinia, Wyethia, Yellow Dock, and Yellow Jessamine. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aconite (Aconite Root, Monkshood, or Aconiti Tuber P.I.). Gives chemical composition, description of unground aconite, histology, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Aletris (Stargrass or True Unicorn-Root). Gives chemical composition, description of unground aletris and powdered aletris, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Apocynum (Black Indian Hemp or Canada-hemp). Gives chemical composition, description of unground apocynum and powdered apocynum, histology, assay, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aralia (American Spikenard or Spignet). Gives chemical composition, description of unground aralia and powdered aralia, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Berberis (Oregongrape Root). Gives chemical composition, description of unground berberis and powdered berberis, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Blue Flag. Gives chemical composition, descriptions of unground and powdered blue flag, histology, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Bryonia. Gives chemical composition, description of unground bryonia and powdered bryonia, identification, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calamus (Sweetflag). Gives chemical composition, description of unground calamus and powdered calamus, histology, cereal flours and althea, unpeeled calamus, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calumba (Colombo). Gives chemical composition, description of unground calumba and powdered calumba, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Caulophyllum (Blue Cohosh). Gives chemical composition, description of unground caulophyllum and powdered caulophyllum, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Chionanthus (Fringe Tree Bark). Gives chemical composition, description of unground chionanthus and powdered chionanthus, histology, assay, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Colchicum Corm. Gives chemical composition, description of unground colchicum corm and powdered colchicum corm, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Convallaria (Convallaria Root N.F. VI or Lily-of-the-Valley Root). Gives chemical composition, description of unground convallaria and powdered convallaria, histology, assay, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Corydalis (Turkeycorn or Squirrel-corn). Gives chemical composition, description of unground and powdered corydalis, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cotton Root Bark. Gives chemical composition, description of unground and powdered cotton root bark, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Dioscorea (Wild Yam Root). Gives chemical composition, description of unground and powdered dioscorea, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Echinacea. Gives chemical composition, description of unground and powdered echinacea, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Euonymus (Wahoo Bark). Gives chemical composition, unground and powdered euonymus, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Gelsemium (Yellow Jasmine Root). Gives chemical composition, description of unground and powdered gelsemium, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Helonias (False Unicorn-Root). Gives chemical composition, description of unground and powdered helonias, histology, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Hydrangea (Seven-Bark). Gives chemical composition, description of unground and powdered hydrangea, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Hydrastis (Goldenseal or Hydrastidis Rhizoma P.I.). Gives chemical composition, description of unground and powdered hydrastis, histology, identification, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ipomea (Orizaba Jalap or Mexican Scammony). Gives chemical composition, description of unground and powdered ipomea, histology, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Jalap. Gives chemical composition, descriptions of unground and powdered jalap, histology, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Krameria (Rhatany). Gives chemical composition, descriptions of unground Peruvian rhatany and Para rhatany, and powdered krameria, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lappa (Burdock Root). Gives chemical composition, descriptions of unground and powdered lappa, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Leptandra (Culversroot). Gives chemical composition, descriptions of unground and powdered leptandra, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Orris. Gives chemical composition, descriptions of unground and powdered orris, histology, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phytolacca (Pokeroot). Gives chemical composition, description of unground and powdered phytolacca, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Podophyllum (Mandrake or May Apple). Gives chemical composition, description of unground podophyllum, powdered podophyllum, and Indian podophyllum, histology, assay, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pulsatilla (Pasqueflower). Gives chemical composition, description of unground and powdered pulsatilla, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sanguinaria (Bloodroot). Gives chemical composition, description of unground and powdered sanguinaria, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Serpentaria. Gives chemical composition, description of unground and powdered serpentaria, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Squill. Gives chemical composition, description of unground and powdered squill, histology, red squill, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Stillingia (Queensroot). Gives chemical composition, description of unground and powdered stillingia, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sumbul (Musk Root). Gives chemical composition, description of unground and powdered sumbul, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Taraxacum (Dandelion Root). Gives chemical composition, description of unground and powdered taraxacum, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Trillium (Bethroot). Gives chemical composition, description of unground and powdered trillium, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Triticum (Dog-Grass or Couchgrass). Gives chemical composition, description of unground and powdered triticum, histology, test for purity, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Valerian. Gives chemical composition, description of unground and powdered valerian, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Veratrum Viride (Green Hellebore or American Hellebore). Gives chemical composition, description of unground and powdered veratrum viride, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Viburnum Prunifolium (Blackhaw). Gives chemical composition, description of unground and powdered viburnum prunifolium, histology, preparations, and average dose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Squill, (Red Squill, White Squill, Sea Onion). Covers definition, derivation and characteristics, uses, grades and forms, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Belladonna Root (Deadly Nightshade Root). Description, assay, and storage. U.S.P. product of belladonna root—Emplastrum Belladonnae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ipecac. Description and assay. U.S.P. products of ipecac—Fluidextractum Ipecacuanhae, Syrupus Ipecacuanhae.

816.2 FRUITS AND BERRIES

816.21 Orange

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Bitter Orange (Elixir Curassao). Gives chemical composition, preparation, storage, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bitter Orange Peel. Description. U.S.P. products of bitter orange peel—Tinctura Aurantii Amori, Tinctura Gentianae Composita.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sweet Orange Peel. Description. U.S.P. products of sweet orange peel—Oleum Aurantii, Syrupus Aurantii, Tinctura Aurantii Dulcis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Bitter Orange Peel. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Sweet Orange Peel. Preparation and alcohol content. U.S.P. product of tincture of sweet orange peel—Syrupus Aurantii.

816.22 Lemon

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Lemon Peel. Description. U.S.P. products of lemon peel—Oleum Limonis, Syrupus Acidi Citrici, Tinctura Limonis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Lemon. Preparation and alcohol content. U.S.P. product of tincture of lemon—Syrupus Acidi Citrici.

816.23 Rhamnus Cathartica

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Rhamnus Cathartica (Buckthorn-Berries). Gives chemical composition, description of unground and powdered rhamnus cathartica, identification, preparation, and average dose.

816.24 Serenoa

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Serenoa and Sandalwood (Compound Elixir of Saw Palmetto and Santal or Sabal-Santal Elixir). Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Serenoa (Fluidextractum Sabal, N.F. VI). Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Serenoa (Saw Palmetto-Berries). Gives chemical composition, description of unground and powdered serenoa, preparations, and average dose.

816.25 Apple

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Balsam Apple, Bitter Apple, and Thorn Apple. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Colocynth (Colocynth Pulp or Bitter Apple). Gives chemical composition, description of unground colocynth, powdered colocynth, and epicarp and seed; histology, assay, preparations, and average dose.

816.29 Miscellaneous Fruits and Berries

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. American Holly, Black Alder, Black Nightshade, Black Pepper, Burning Bush, Chaste Tree, Cubebs, English Walnut, Hawthorn, Manchineel, Mistletoe, Nipple Nightshade, Prickly Ash, Purging Buckthorn, Saw Palmetto, and Water Hemlock. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Capsicum (Cayenne Pepper). Gives chemical composition, description of unground capsicum and powdered capsicum, histology, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cocculus. Gives chemical composition, description of unground cocculus and powdered cocculus, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cubeb. Gives chemical composition, description of unground and powdered cubeb, histology, identification, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Juniper. Gives chemical composition, descriptions of unground and powdered juniper, histology, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Vanilla. Gives chemical composition, description of unground vanilla, histology, test for purity, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Xanthoxylum Fruit (Prickly Ash Berries). Gives chemical composition, description of unground and powdered xanthoxylum fruit, and average dose.

816.3 LEAVES, FLOWERS, AND BUDS

816.31 Digitalis

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Digitalis. Gives assay, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Infusion of Digitalis. Gives chemical composition, preparation, storage, alcohol content, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Digitalis (Foxglove). Description, assay, and storage. U.S.P. products of digitalis—Capsulae Digitalis, Digitalis Pulverata, Injectio Digitalis, Tabellae Digitalis, Tinctura Digitalis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Digitalis Capsules. Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Digitalis Injection (Digitalis Ampuls). Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Digitalis Tablets. Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Powdered Digitalis. Description and physical properties, assay, and storage. U.S.P. products of digitalis—*see* Digitalis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Digitalis. Preparation, assay, and alcohol content.

816.32 Eriodictyon

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Yerba Santa. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Eriodictyon (Yerba Santa). Description. U.S.P. product of eriodictyon—Fluidextractum Eriodictyi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Eriodictyon (Fluidextract of Yerba Santa). Preparation and alcohol content.

816.33 Peppermint

U. S. Pharmacopoeial Convebtion. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Peppermint. Description. U.S.P. products of peppermint—Aqua Menthae Piperitae, Oleum Menthae Piperitae, Spiritus Menthae Piperitae.

816.34 Spearmint

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spearmint. Description. U.S.P. products of spearmint—Aqua Menthae Viridis, Oleum Menthae Viridis, Spiritus Menthae Viridis.

816.35 Senna

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Senna. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Powder of Senna (Compound Licorice Powder). Gives chemical composition, description, identification, sulfide, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Infusion of Senna With Magnesium Sulfate. Gives chemical composition, preparation, storage, and average dose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Senna Leaves. Covers definition, characteristics and derivation, uses, grades, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Senna. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Senna (Senna Leaves). Description and identification. U.S.P. products of senna—Fluidextractum Sennae, Syrupus Sennae.

816.36 Cloves

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Clove (Cloves). Description, purity, clove fruit or cereals, assay, and storage. U.S.P. product of clove—Oleum Caryophylli.

816.37 Cocaine

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cocaine. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, cinnamyl-cocaine and other reducing substances, isoatropyl-cocaine, and storage. U.S.P. product of cocaine—Cocainae Hydrochloridum.

816.38 Hyoscyamus

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Hyoscyamus (Fluidextract of Henbane). Gives assay, alcohol content, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract Hyoscyamus (Extract of Henbane)—Pilular Extract of Hyoscyamus. Assay. Powdered Extract of Hyoscyamus. Assay and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Hyoscyamus (Henbane). Description and assay. U.S.P. products of hyoscyamus—Extractum Hyoscyami (Pilular and Powdered), Tinctura Hyoscyami.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Hyoscyamus (Tincture of Henbane). Preparation, assay, and alcohol content.

816.39 Miscellaneous Leaves Flowers, and Buds

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Adam's Needle, Alfalfa (Spanish), American Holly, Aspen, Bearberry, Bird Cherry, Blackthorn, Blue Vervain, Boneset, Brazilian Burdock, Brazilian Snakeroot, Buchu, Buku, Caroba Bark, Century Plant, Cherry Laurel, Chestnut, Coca, Dead Nettle, Duboisia, Elder, English Walnut, European Elder, Fever Tree, Foxglove, Golden Flowered Rhododendron, Golden Rod, Guaco, Guao, Gum Plant, Hemlock Spruce, House Leek, Indian Shot, Magnolia, Manchineel, Mimosa, Mistletoe, Morning Glory, Mountain Laurel, Myrtle, New Jersey Tea, Paraguay Tea, Passion Flower, Pennywort, Pilocarpus, Plumbago Littoralis, Poison Ivy, Poison Sumach, Puka Puka, Red Clover, Rose Laurel, Saffron, Sage, Savin, Smooth Sumach, Snake-Headed Grindelia, Solanum Arrebenta, Sorrel, Sour Wood, Southernwood, Spiderwort, Sunflower, Tansy, Tea, Tobacco, Tree of Heaven, Tree of Life, Tree Stramonium, Virgin's Bower, White Clover, White Melilot, Wormseed, and Yellow Melilot. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Arnica. Gives chemical composition, description of unground arnica and powdered arnica, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Buchu. Gives chemical composition, description of unground short buchu, unground oval buchu, unground long buchu, and powdered buchu, histology, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calendula (Marigold). Gives chemical composition, description of unground calendula and powdered calendula, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Castanea (Chestnut Leaves). Gives chemical composition, description of unground castanea and powdered castanea, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cataria (Catnip or Catmint). Gives chemical composition, description of unground cataria and powdered cataria, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Chimaphila (Pipsissewa). Gives chemical composition, description of unground chimaphila and powdered chimaphila, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Corn-Silk. Gives kind, description, histology, identification, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Crocus (Spanish Saffron). Gives chemical composition, description of unground crocus, histology, composite florets, identification, loss on drying, organic dyes, fixed oil or glycerin, assay for color, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Damiana (Turnera). Gives chemical composition, description of unground and powdered damiana, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Eupatorium (Thoroughwort or Boneset). Gives chemical composition, unground and powdered eupatorium, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Gambir (Pale Catechu). Gives chemical composition, description of unground and powdered gambir, identification, assay for water-soluble and for alcohol-soluble extractive, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Grindelia. Gives chemical composition, description of unground and powdered grindelia, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Hamamelis Leaf (Witch-Hazel Leaves). Gives chemical composition, description of unground and powdered hamamelis leaf, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Humulus (Hops). Gives chemical composition, description of unground and powdered humulus, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Kamala (Glandulae Rottlerae). Gives chemical composition, description, assay, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lobelia (Indian-Tobacco). Gives chemical composition, description of unground and powdered lobelia, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary, Committee. The National Formulary, Seventh Edition, 1942. Lupulin. Gives chemical composition, description, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Matricaria (Hungarian Chamomile or German Chamomile). Gives chemical composition, description of unground and powdered matricaria, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Poplar Bud. Gives chemical composition, description of unground poplar bud, histology, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Rose (French Rose or Rosa Gallica). Gives chemical composition, description of unground rose, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sage. Gives chemical composition, descriptions of unground sage, powdered sage, and other sage species, histology, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sambuscus (Elder Flowers).

Gives chemical composition, description, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Thyme. Gives chemical composition, description of unground and powdered thyme, histology, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Trifolium (Red Clover Blossoms). Gives chemical composition, description of unground and powdered trifolium, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Uva Ursi (Bearberry). Gives chemical composition, description of unground and powdered uva ursi, histology, identifications, preparations, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Belladonna Leaf (Deadly Nightshade Leaf). Description, assay, and storage. U.S.P. products of belladonna leaf—Atropina Atropinae Sulfas, Extractum Belladonnae, Tabellae Atropinae Sulfatis, Tinctura Belladonnae, Unguentum Belladonnae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pilocarpine Nitrate. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, chloride, various foreign alkaloids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Stramonium (Jimson Weed, Jamestown Weed). Preparation, description, and assay. U.S.P. products of stramonium—Extractum Stramonii (Pilular and Powdered), Tinctuea Stramonii.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Belladonna (Tincture of Belladonna Leaf). Preparation, assay, and alcohol content.

816.4 SEEDS AND NUTS

816.41 Colchicum

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Colchicine. Description, solubility, melting point, identification, loss on drying, ash, chloroform, colchiceine, and storage. U.S.P. product of colchicine—Tabellae Colchiciane.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Colchicum Seed. Description, assay, and storage. U.S.P. products of colchicum seed—Colchicina, Tabellae Colchicinae, Tinctura Colchici Seminis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Colchicum Seed (Tincture of Colchicum). Preparation, assay, and alcohol content.

816.42 Linseed (Flaxseed)

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Linseed (Flaxseed). Description, starch or starch-bearing seeds, and assay. U.S.P. product of Linseed—Oleum Lini.

816.43 Myristica (Nutmeg)

American Institute of Homeopathy. Homeopathic Pharmacopoeia of U. S., 1941. Nutmeg. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Myristica, (Nutmeg). Description and assay. U.S.P. product of muristica—Oleum Myristicae.

816.44 Rice Polishings

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Rice Polishings (Rice Bran, Tikitiki). Description, histology, rice hull or other foreign matter, identification, starch, and storage. U.S.P. product of rice polishings—Extractum Perpolitionum Oxyzae.

816.45 Mustard

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Black Mustard and White Mustard. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Black Mustard (Brown Mustard). Description and assay. U.S.R. product of black mustard—Emplastrum Sinapis.

816.46 Cardamom

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cardamom Seed. Description and storage. U.S.P. product of cardamom seed—Tinctura Cardamoni Composita.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Cardamom. Gives chemical composition, preparation, storage, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Tincture of Cardamom. Preparation and alcohol content.

816.47 Caraway

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Caraway (Caraway Fruit, Caraway Seed). Description and storage.

816.49 Miscellaneous Seeds and Nuts

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. American Coffee Tree, Bitter Almond, Bitter Candytuft, Brazilian Cocoa, Buckeye, Burdock, Castor Oil Plant, Cedrone, Cevadilla, Common Pawpaw, Corn Cockle, Cotton Plant, Darnel, False Gromwell, Hickory Nut, Horse Chestnut, Indian Cockle, Jambol Seeds, Madagascar Poison Nut, Marking Nut, Oat, Physic Nut, Poison Nut, Red Pepper, Rose Apple, St. Mary's Thistle, Star Anise, Stavesacre, Strophanthus Hispidus, and Wild Vetch.

Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Anise. Gives chemical composition, description of unground anise and powdered anise, histology, conium maculatum fruit, assay, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Areca (Arecanut or Betelnut). Gives chemical composition, description of unground areca and powdered areca, histology, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Commmttee. The National Formulary, Seventh Edition, 1942. Cacao. Gives chemical composition, description, ether-soluble residue and ether-insoluble residue, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Celery Fruit (Celery Seed). Gives chemical composition, description of unground celery fruit and powdered celery fruit, histology, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Coriander. Gives chemical composition, description of unground and powdered coriander, histology, assay, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fennel. Gives chemical composition, description of unground and powdered fennel, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Guarana. Gives chemical composition, description of unground and powdered guarana, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Kola (Cola or Kolanuts). Gives chemical composition, descriptions of unground and powdered kola, assay, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Larkspur. Gives chemical composition, description of unground and powdered larkspur, histology, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oat. Gives chemical composition, description of unground oat and powdered oat, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Plantago Seed (Psyllium or Plantain Seed). Gives chemical composition, description of unground plantago seed, histology, test for quality, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Strophanthus. Gives chemical composition, description of unground (Kombe), unground (Hispidus), and powdered strophantus, histology, identification, purity, assay, preparation, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nux Vomica. Description and assay. U.S.P. products of nux vomica—Strychninae Sulfas Tabellae Strychninae Sulfatis, Tinctura Nucis Vomicae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ouabain. Description, solubility, melting point, optical rotation, identification, loss on drying, ash, reaction, alkaloids, and storage. U.S.P. product of ouabain—Injectio Ouabaini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Picrotoxin (Cocculin). Description, solubility, melting point, identification, ash, reaction, alkaloids, and storage. U.S.P. product of picrotoxin—Injectio Picrotoxini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Nux Vomica. Preparation, assay, and alcohol content.

816.5 BARK AND STEM

816.51 Cherry

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Bird Cherry, Choke Cherry, and Wild Black Cherry. Natural order, synonyms, description habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Wild Cherry (Wild Black Cherry Bark). Description and storage. U.S.P. product of wild cherry—Syrupus Pruni Virginianae.

816.52 Red Saunders

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Red Saunders. Description, identification, and purity.

816.53 Cascara Sagrada

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Cascara. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Cascara Sagrada. Gives chemical composition, preparation, storage, alcohol content, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Fluidextract of Cascara Sagrada (Aromatic Fluidextract of Rhamnus Purshiana). Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cascara Sagrada. Description and identification. U.S.P. products of cascara sagrada—Extractum Cascarae Sagradae, Fluidextractum Cascarae Sagradae, Fluidextractum Cascarae Sagradae Aromaticum, Tabellae Cascarae Sagradae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Cascara Sagrada (Extract of Rhamnus Purshiana). Preparation.

U. S. Pharmacopoeial Convention. Pharamcopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Cascara Sagrada (Fluidextract of Rhamnus Purshiana). Preparation and alcohol content.

816.54 Cinnamon

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Cinnamon. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharamcopoeia of U. S. A., Twelfth Revision, 1942. Cinnamon. Description, assay, and storage. U.S.P. products of Cinnamon—Aqua Cinnamomi, Oleum Cinnamomi, Spiritus Cinnamomi.

816.55 Cinchona

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cinchona (Cinchona Bark or Peruvian Bark). Gives chemical composition, description of unground cinchona and powdered cinchona, histology, identification, assay, preparation, and average dose.

816.56 Ash

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. American Mountain Ash, Prickly Ash, and White Ash. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Xanthoxylum (Prickly Ash Bark). Gives chemical composition, description of unground and powdered xanthoxylum, histology, test for purity, preparation, and average dose.

816.57 Dogwood

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Dogwood, Round-Leaved Dogwood, Shrubby Trefoil, and Swamp Dogwood. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.59 Miscellaneous Bark and Stem

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. American Ivy, Aspen, Bayberry, Bitter Wood, Black Alder, Black Haw, Black Willow, Buckthorn, Butternut, Cascarilla, Cereus Bonplandii, China, Condor Plant, Cuspari Bark, Dita Bark, Fringe Tree, Guao, Hemlock Spruce, High Bush Cranberry, Locust, Logwood, Manchineel, Mezereon, Night-Blooming Cereus, Poison Sumach, Purple Willow, Red Cedar, Red Wood, Sassy Bark, Savin, Scotch Pine, Smooth Sumach, Soap Bark, Sweet-Scented Spurge Laurel, Tag Alder, Tree of Heaven, Virgin's Bower, Wahoo, Wicopy, Wild Indigo, Witch Hazel, and Yew. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Adonis (Adonis Vernalis or Pheasanteye). Gives chemical composition, description of unground adonis and powdered adonis, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cactus Grandiflorus (Night-Blooming Cereus). Gives description of whole cactus grandiflorus, histology, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Condurango. Gives chemical composition, description of unground condurango and powdered condurango, histology, identification, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elm. Gives chemical composition, description of unground and powdered elm, histology, identification, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Euphorbia Pilulifera (Pill-Bearing Spurge). Gives chemical composition, unground and powdered euphorbia pilulifera, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Frangula (Buckthorn Bark). Gives chemical composition, description of unground and powdered frangula, histology, identifications, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Kino. Gives descriptions of unground and powdered kino, identification, descriptions of alcohol-soluble extractive and water-soluble extractive, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mezereum. Gives chemical composition, description of unground and powdered mezereum, histology, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mitchella (Squawvine). Gives chemical composition, description of unground and powdered mitchella, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Quassia (Bitter Wood). Gives chemical composition, description of unground Jamaica quassia, unground Surinam quassia, and powdered quassia, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Quillaja (Soaptree-Bark). Gives chemical composition, description of unground and powdered quillaja, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sassafras. Gives chemical composition, description of unground and powdered sassafras, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Scutellaria (Skullcap). Gives chemical composition, description of unground and powdered scutellaria, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Viburnum Opulus (High-Bush Cranberry Bark or True Cramp Bark). Gives chemical composition, description of unground and powdered viburnum opulus, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Viburnum Prunifolium (Blackhaw). Gives chemical composition, description of unground and powdered viburnum prunifolium, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. White Pine. Gives chemical composition, description of unground and powdered white pine, histology, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. White Sandalwood. Gives chemical composition, description of unground white sandalwood, histology, assay, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Totaquine. Description, solubility, identification, loss on drying, ash, assay for quinine and cinchonidine, assay for quinidine, and storage.

816.6 SEAWEED, MOSS, ALGA, AND LICHEN

816.61 Agar

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Agar (Agar-Agar). Description, solubility, identification, foreign starch, and gelatin.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1041; 1935. Agar; Bacteriological.

816.62 Chondrus

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Chondrus (Irish-moss). Gives chemical composition, description of whole chondrus, identifications, gelatine and starch, sulfites, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mucilage of Chondrus (Mucilage of Irish Moss). Gives chemical composition, preparation, and storage.

816.63 Cudbear

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cudbear. Gives chemical composition, description, identification, logwood, coal-tar colors, starch, arsenic, assay for color, and preparation.

816.64 Lycopodium

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Lycopodium. Description, identification, fine pollen, and starch or dextrin.

816.65 Bearded Usnea

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U.S., 1941. Bearded Usnea. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.66 Club Moss

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Club Moss. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.67 Lungwort

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Lungwort. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for homoeopathic medicines.

816.68 Sea Wrack

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sea Wrack. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.7 BALSAMS, RESINS, OLEORESINS, AND GUMS

816.70 General Items

816.71 Manna

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Manna. Gives chemical composition, description, assay, preparation, and average dose.

816.72 Mastic

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mastic. Gives chemical composition, description, acid number, assay for alcohol-insoluble residue and for ether-insoluble residue, and preparation.

816.73 Copaiba

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Balsam of Copaiba. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Copaiba. Gives description, solubility, specific gravity, acid value, paraffin or fatty oils, paraffin oils, gurjun balsam, dehydrated alcohol-insoluble matter, African copaiba, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mixture of Copaiba (Lafayette Mixture). Gives chemical composition, storage, alcohol content, average dose, and preparation.

816.74 Capscium

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oleoresin of Capsicum. Gives test for quality, storage, preparation, and average dose.

816.75 Cubeb

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oleoresin of Cubeb. Gives preparation, assay, storage, and average dose.

816.76 Ginger

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Oleoresin of Ginger. Gives chemical composition, assay, storage, preparation, and average dose.

816.77 Camphor

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Camphor. Chemical symbol, synonyms, description, and preparations for tincture, dilutions, medications, triturations, and saturated tincture for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Camphor. Gives chemical composition, preparation, description, test for sterility, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Camphorated Phenol. Gives chemical composition and preparation.

816.79 Miscellaneous Balsams, Resins, Oleoresins, and Gums

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Asafoetida, Australian Red Gum, Balsam of Peru, Benzoin, Black Spruce, Gamboge, Guaiac, Gum Ammoniac, Gum Euphorbium, Olibanum, and Resin of Podophyllum. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Asafetida. Gives chemical composition, description, identifications, most foreign resins, galbanum, ammoniac, rosin, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Gamboge. Gives chemical composition, description of unground gamboge and powdered gamboge, identification, starch, assay, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Guaiac. Gives chemical composition, description, solubility, melting point, identifications, rosin, assay, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Resin of Ipomea (Resin of Mexican Scammony). Gives description, solubility, identification, loss on drying, ash, alcohol-insoluble residue, soluble impurities, aloin, guaiac, rosin, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Resin of Jalap. Gives description, solubility, solubility in chloroform, loss on drying, acid resins, guaiac, rosin, rosin or other resins, soluble impurities and aloin, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Resin of Podophyllum. Gives chemical composition, description, solubility, identifications, ash, reaction, difference from resin of podophyllum emodi, storage, preparations, and average dose.

816.8 PLANTS

816.81 Buttercup

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Buttercup, Celery-Leaved Buttercup, Creeping Buttercup, and Tall Buttercup. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.82 Lily

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Lily of the Valley and Tiger Lily. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.83 Marigold

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Garden Marigold and Marsh Marigold. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.84 Nettle

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Common Nettle, Dwarf Nettle, and Horse Nettle. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.85 Parsley

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Parsley, Fool's Parsley, and Mountain Parsley. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.86 Thistle

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Blessed Thistle, Canada Thistle, and St. Mary's Thistle. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.87 Thyme

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Cat Thyme and Wild Thyme. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.89 Miscellaneous Plants

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Aconite, American Arum, American Pulsatilla, American Wormseed, Asarsbacca, Asparagus, Balmony, Bear's Breech, Beechdrop, Bittersweet, Black Nightshade, Blue Cardinal Flower, Brooklime, Buckbean, Buckwheat, Bugle Weed, Butter Bur, Canada Fleabane, Cardinal Flower, Celandine, Chamomile, Common Vervain, Common Wormwood, Compass Plant, Cone Flower, Daisy, Dandelion, Deadly Nightshade, Dog's Mercury, Dyer's Weed, Evening Primrose, Everlasting, Eyebright, Figwort, Fire Weed, Frost-Weed, Hedge Hyssop, Heliotrope, Hemp, Henbane, Herb Paris, Herb Robert, Indian Acalypha, Indian Pennywort, Indian Pipe, Indian Tobacco, Large Spotted Spurge, Leopard's Bane, Liferoot, Liverwort, Low Cudweed, Mullein, Pansy, Partridge Berry, Pennyroyal, Peppermint, Periwinkle, Pheasant's Eye, Pipsissewa, Pitcher Plant, Plantain, Poison Hemlock, Poisonous Lettuce, Prickly Pear, Purging Flax, Rag Weed, Rattlesnake Root, Red Root, Roman Chamomile, Rue, St. John's Wort, Scarlet Pimpernel, Scouring Rush, Sea Holly, Shepherd's Purse, Shrubby Plectanthus, Skull Cap, Snow Berry, Stone Crop, Sundew, Sweet Vernal Grass, Thorn Apple, Toad Flax, Tomato, Trailing Arbutus, Violet, Waterleaf, Water Smart Weed, Wild Rosemary, Wind Flower, Wintergreen, and Yarrow. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.9 MISCELLANEOUS BOTANICAL MEDICINALS

816.91 Beans

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Calabar Bean, St. Ignatius' Bean, and Tongo Bean. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.92 Fungi

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Bug Agaric, Emetic Mushroom, Larch Agaric, Maize Smut, Pine Agaric, Puff Ball, and Rye Ergot. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

816.99 Miscellaneous Botanical Medicinals Not Otherwise Classified

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Cowhage. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

817. MEDICINALS FOR APPLICATIONS AND INJECTIONS

817.1 CLAYS AND EARTH

817.11 Bentonite

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Magma of Bentonite. Gives chemical composition, storage, and preparations.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bentonite. Description, solubility, identification, fineness of powder, loss on drying, reaction, arsenic, and storage. U.S.P. product of bentonite—Mistura Cretae.

817.12 Chalk (Calcium Carbonate)

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chalk Mixture. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Chalk Powder. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercury With Chalk (Gray Powder). Description, identification, mercurous oxide, mercuric oxide, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoiea of U. S. A., Twelfth Revision, 1942. Precipitated Calcium Carbonate (Precipitated Chalk). Description, solubility, identification, loss on drying, acid-insoluble material, barium, heavy metals, iron, magnesium and alkali salts, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Prepared Chalk (Drop Chalk). Description, solubility, identification, acid-insoluble residue, heavy metals, assay, and storage. U.S.P. products of prepared chalk— Hydrargyrum cum Creta, Mistura Cretae, Pulvis Cretae Compositus.

817.13 Siliceous Earth

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Purified Siliceous Earth (Purified Kieselguhr, Purified Infusorial Earth). Description, identification, loss on ignition, acid-soluble substances, organic impurities, carbonate, sulfate, water-soluble iron and reaction, and storage.

817.14 Pumice

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pumice. Gives chemical composition, description, solubility, description of powdered pumice, soluble substances, acid soluble residue, iron, and storage.

817.15 Kaolin

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Kaolin. Gives chemical composition, description, solubility, identification, loss on ignition, acid-soluble substances, carbonate, iron, storage, and preparation.

817.16 Lava

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Hecla Lava. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

817.17 Gastein Rock

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Gastein Rock. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

817.2 INJECTIONS

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Injections. Vehicles for injections, preparation of injections, preservatives and other added substances, bacteriostatic agents, sterilization methods, containers, single and multiple doses, determination of the volume of injection in containers, appearance of solutions or suspensions, labeling, and quantities in ampuls and other containers.

817.21 Bismuth Injection

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth and Potassium Tartrate Injection (Bismuth and Potassium Tartrate Ampuls). Aqueous solution, identification, and assay. Oil suspension, identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth Subsalicylate Injection (Bismuth Subsalicylate Ampuls). Identification, assay, storage, and sizes.

817.22 Dextrose Injection

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dextrose and Sodium Chloride Injection (Dextrose and Sodium Chloride Ampuls). Identification, heavy metals, assay for dextrose, assay for sodium chloride, pyrogens, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dextrose Injection (Dextrose Ampuls). Identification, heavy metals, assay, pyrogens, and storage.

817.23 Liver Injection

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Liver Injection (Liver Extract for Parenteral Use). Description, storage, and sizes.

817.24 Insulin Injection

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Insulin Injection (Insulin, Insulin Hydrochloride). Description, identification, reaction, total nitrogen, zinc, ash, assay, blood-sugar determination, interpretation of the data, and storage.

817.25 Parathyroid Injection

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Parathyroid Injection (Solution of Parathyroid, Parathyroid Extract). Assay, determination of serum calcium, storage, and sizes.

817.26 Suppositories

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Suppositories of Boroglycerin. Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerin Suppositories. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Suppositories. Recommended sizes, weights, and shapes. Processes of manufacture for suppositories made with oil of theobroma and made with glycerinated gelatin.

817.29 Miscellaneous Injections

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Caffeine and Sodium Benzoate Injections (Caffeine and Sodium

Benzoate Ampuls). Identification, assay for caffeine, assay for sodium benzoate, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Calcium Gluconate Injection (Calcium Gluconate Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Digitalis Injection (Digitalis Ampuls). Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emetine Hydrochloride Injection (Emetine Hydrochloride Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Epinephrine Hydrochloride Injection (Epinephrine Hydrochloride Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Histamine Phosphate Injection (Histamine Acid Phosphate Injection). Description, identification, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercuric Salicylate Injection (Mercuric Salicylate Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercurophylline Injection. Description, identification, mercury ions, assay of mercury, assay of theophylline, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mersalyl and Theophylline Injection (Mersalyl and Theophylline Ampuls). Identification, reaction, mercuric ion, assay for mercury, assay for theophylline, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neostigmine Methylsulfate Injection (Neostigmine Methylsulfate Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ouabain Injection (Ouabain Ampuls). Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenolsulfonphthalein Injection (Phenolsulfonphthalein Ampuls). Identification, sensitiveness, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Picrotoxin Injection. Identification, limit of sodium chloride, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Posterior Pituitary Injection (Solution of Posterior Pituitary, Solution of Pituitary). Description, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Hydrochloride and Ethyl Carbamate Injection (Quinine-Urethane Injection). Identification, assay for quinine hydrochloride, assay for ethyl carbamate, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strophanthin Injection (Strophanthin Ampuls). Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfobromophthalein Sodium Injection (Sulfobromophthalein Sodium Ampuls). Identification, sensitiveness, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline Ethylenediamine Injection (Theophylline Ethylenediamine Ampuls, Aminophylline Ampuls). Identification, assay, storage, and sizes.

817.3 LINIMENTS

817.31 Camphor Liniment

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Camphor and Soap Liniment (Soap Liniment). Preparation, alcohol content, and storage. U.S.P. product of camphor and soap liniment—Linimentum Chloroformi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Camphor Liniment (Camphorated Oil). Preparation, assay, and storage.

817.32 Chloroform Liniment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Liniment of Aconite and Chloroform. Gives chemical composition, storage, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chloroform Liniment. Preparation, assay, alcohol content, and storage.

817.33 Soap Liniment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Liniment of Soft Soap (Compound Tincture of Green Soap). Gives chemical composition, storage, alcohol content, and composition.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solid Liniment of Soap (Camphorated Soap Liniment or Solid Opodeldoc). Gives chemical composition, storage, alcohol content, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Camphor and Soap Liniment (Soap Liniment). Preparation, alcohol content, and storage. U.S.P. product of camphor and soap liniment—Linimentum Chloroformi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Liniment of Soft Soap (Tincture of Green Soap). Preparation and alcohol content.

817.34 Dental Liniment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Dental Liniment of

Aconite and Iodine. Gives chemical composition, preparation, alcohol content, and storage.

817.35 Ammonia Liniment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammonia Liniment (Volatile Liniment or Hartshorn Liniment). Gives chemical composition, preparation, and storage.

817.36 Belladonna Liniment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Belladonna Liniment. Gives chemical composition, storage, alcohol content, and preparation.

817.37 Turpentine Liniment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Acetic Liniment of Turpentine (Linimentum Album, N.F., St. John Long's Liniment, or Stoke's Liniment). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Turpentine Liniment (Kentish Ointment). Gives chemical composition, storage, and preparation.

817.39 Miscellaneous Liniments

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calamine Liniment. Gives chemical composition, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lime Liniment (Carron Oil). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Neocalamine Liniment. Gives chemical composition, preparation, and storage.

817.4 PASTES AND WAXES

817.41 Acid Pastes

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Paste of Acetylsalicylic Acid (Dental Anodyne Paste). Gives chemical composition, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Paste of Zinc Oxide With Salicylic Acid. Gives chemical composition, assay, storage, and preparation.

817.42 Bismuth Paste

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Paste of Bismuth (Beck's Bismuth Paste). Gives chemical composition, preparation, and storage.

817.43 Pectin Paste

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pectin Paste. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Thin Pectin Paste. Gives chemical composition, preparation, and storage.

817.44 Resorcinol Paste

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mild Paste of Resorcinol (Lassar's Mild Resorcinol Paste). Gives chemical composition, assays for resorcinol and zinc oxide, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Strong Paste of Resorcinol (Lassar's Stronger Resorcinol Paste). Gives chemical composition, preparation, assay for resorcinol and for zinc oxide, and storage.

817.45 Zinc-Oxide Paste

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Hard Paste of Zinc Oxide (Unna's Hard Zinc Paste. Gives chemical composition and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Paste of Zinc Oxide. Gives chemical composition, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Paste of Zinc Oxide With Salicylic Acid. Gives chemical composition, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Soft Paste of Zinc Oxide (Unna's Soft Zinc Paste. Gives chemical composition, preparation, and storage.

817.46 Kaolin Paste

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cataplasm of Kaolin. Gives chemical composition, preparation, and storage.

817.47 Waxes

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1085; 1939. Wax; Bone, Sterile.

817.5 OINTMENTS

817.50 General Items

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1075A; 1941. Ointments in Collapsible Tubes.

817.51 Acid Ointment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Ointment of Benzoic and Salicylic Acid (Whitfield's Ointment). Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Boric Acid Ointment (Boracic Acid Ointment). Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tannic Acid Ointment. Preparation.

817.52 Belladonna Ointment

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Belladonna Ointment. Preparation and assay.

817.53 Mercury Ointment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Mercuric Nitrate (Citrine Ointment). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Mild Mercurous Chloride (Calomel Ointment). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Red Mercuric Oxide. Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ammoniated Mercury Ointment (White Precipitate Ointment). Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mild Mercurial Ointment (Diluted Mercurial Ointment, Blue Ointment). Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strong Mercurial Ointment (Mercurial Ointment). Preparation and assay. U. S.P. product of strong mercurial ointment—Unguentum Hydrargyri Mite.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Yellow Mercuric Oxide Ointment. Preparation and assay.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1084; 1939. Mercurous Chloride Ointment; Mild.

817.54 Iodine Ointment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Potassium Iodide. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Stainless Iodized Ointment. Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iodine Ointment. Preparation and assay.

817.55 Tar Ointment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Ointment of Tar. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Coal Tar. Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pine Tar Ointment. Preparation.

817.56 Sulfur Ointment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Alkaline Ointment of Sulfur. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Ointment of Sulfur (Wilkinson's Ointment or Hebra's Itch Ointment). Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfur Ointment. Preparation and assay.

817.57 Zinc Ointment

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Zinc Stearate. Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Zinc Oxide Ointment (Zinc Ointment). Preparation (calcium, magnesium, and other foreign substances) and assay.

817.59 Miscellaneous Ointments

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Ointment of Menthol. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Ointment of Resorcinol. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Calamine (Unguentum Calaminare or Turner's Cerate). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Camphor. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Capsicum. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Ichthammol. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Lead Oleate. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Mustard. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Neocalamine. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Scarlet Red. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Stramonium. Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chrysarobin Ointment. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethyl Aminobenzoate Ointment. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenol Ointment (Ointment of Carbolic Acid). Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Rose Water Ointment. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. White Ointment (Unguentum, Ointment, Simple Ointment). Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Yellow Ointment. Preparation.

817.6 PLASTERS

817.61 Adhesive Plasters

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Adhesive Absorbent Gauze (Adhesive Absorbent Compress). Description, sterility, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Adhesive Plaster (Adhesive Tape). Description, dimensions, tensile strength, adhesive strength, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sterile Adhesive Plaster (Sterile Adhesive Tape). Description, sterility, other requirements, and storage.

817.62 Belladonna Plasters

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Belladonna Plaster. Description, assay, and storage.

817.63 Mustard Plasters

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mustard Plaster (Mustard Paper). Description and storage.

817.64 Cantharides Plaster

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Plaster of Cantharides. Gives chemical composition, storage, and preparation.

817.65 Lead Plasters

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Plaster of Lead Oleate (Lead Plaster or Diachylon Plaster). Gives chemical composition, storage, and preparation.

817.7 COLLODIONS

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Collodion. Description, specific gravity, identification, free acid, assay, alcohol content, and storage. U.S.P. product of collodion—Collodium Flexile.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Flexible Collodion. Alcohol content and storage.

817.70 General Items

817.71 Salicvlic Collodion

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Salicylic Collodion. Gives chemical composition, preparation, and storage.

817.72 Styptic Collodion

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Styptic Collodion. Gives chemical composition, preparation, and storage.

817.8 LOTIONS

817.81 White Lotion

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. White Lotion (Lotio Sulfurata). Gives chemical composition, storage, and preparation.

817.82 Yellow Lotion

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Yellow Lotion (Yellow Wash). Gives chemical compound, preparation, and storage.

817.83 Calamine Lotion

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calamine Lotion. Gives chemical composition, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Neocalamine Lotion. Gives chemical composition, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phenolated Lotion of Calamine. Gives chemical composition and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phenolated Lotion of Neocalamine. Gives chemical composition and storage.

817.84 Black Lotion

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Black Lotion. Gives chemical composition, storage, and preparation.

817.89 Miscellaneous Lotions

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lotion of Lead and Opium. Gives chemical composition, preparation, storage, and alcohol content.

817.9 MISCELLANEOUS MEDICINALS FOR APPLICATION AND INJECTION

817.91 Salve

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Cerate of Rosin (Deshler's Salve). Gives chemical composition, preparation, and storage.

817.92 Glycerogelatins

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerogelatins. Gives chemical composition, preparation, and storage.

818. LIQUID MEDICAL PREPARATIONS

818.1 WATER

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Waters. Saturated solutions of volatile oils or other aromatic or volatile substances in distilled water, distillation, solution, alternate solution method.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Distilled Water. Description, dissolved solids, reaction, chloride, sulfate, ammonia, calcium, carbon dioxide, and heavy metals.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sterilized Distilled Water. Description and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Water (Aqua). Description, reaction, heavy metals, zinc, foreign volatile matters, dissolved solids, and B. coli. U.S.P. products of water—Aqua Destillata, Aqua Destillata Sterilisata, Aqua Pro Injectione.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Water for Injection. Use in preparation, physical and chemical standards, pyrogens, and added substances.

818.10 General Items

818.11 Orange Flower Water

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Orange Flower Water. Description, residue, reaction, and heavy metals. U.S.P. product of orange flower water—Syrupus Aurantii Florum.

818.12 Camphor Water

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Camphor water. A saturated solution of camphor in distilled water.

818.13 Chloroform Water

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chloroform Water. Description and storage.

818.14 Cinnamon Water

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cinnamon Water. A clear, saturated solution of oil of cinnamon in distilled water.

818.15 Fennel Water

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fennel Water. A clear, saturated solution of oil of fennel in distilled water.

818.16 Peppermint Water

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Peppermint Water. A clear, saturated solution of oil of peppermint in distilled water.

818.17 Spearmint Water

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spearmint Water. A clear, saturated solution of oil of spearmint in distilled water.

818.18 Rose Water

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Rose Water and Stronger Rose Water. Description, reaction, residue, and heavy metals. U.S.P. product of stronger rose water—Aqua Rosae.

818.19 Miscellaneous Waters

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Bitter Almond Water. Gives composition.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Hamamelis Water (Witch-hazel Water or Distilled Extract of Witch-hazel). Gives preparation, chemical composition, description, specific gravity, residue, reaction, acetone and isopropyl alcohol, formaldehyde, methanol, storage, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Phenolated Water (Carbolic Acid Water or Solutio Phenoli, P.I.). Gives chemical composition and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Wintergreen Water. Gives composition.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Anise Water. A clear, saturated solution of oil of anise in distilled water.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 4-25A; 1930. Witch-Hazel.

818.2 EMULSIONS

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emulsions. Description.

818.21 Cod Liver Oil Emulsion

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emulsion of Cod Liver Oil. Preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Cod Liver Oil With Egg. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Cod Liver Oil With Hypophosphites. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Cod Liver Oil With Malt. Gives chemical composition, preparation, storage, and average dose.

818.22 Oil of Turpentine Emulsion

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emulsion of Oil of Turpentine. Preparation.

818.23 Liquid Petrolatum Emulsion

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Emulsion of Liquid Petrolatum With Phenolphthalein. Gives chemical composition, storage, alcohol content, preparation, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Emulsion of Liquid Petrolatum (Mineral Oil Emulsion). Description.

818.3 FLUIDEXTRACTS

818.30 General Items

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextracts. Gives five processes—(A) percolation with one alcoholic menstruum, (B) percolation with two menstrua, (C) fractional or divided percolation, (D) extraction with water, and (E) pressure percolation; and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextracts (Fluid-Extracts). Description, processes, and storage.

818.31 Fluidextract of Roots, Rhizomes, and Bulbs

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Fluidextract of Sarsaparilla. Gives chemical composition, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Aconite. Gives assay, alcohol content, preparations, average dose, and chemical compostion.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Aletris. Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Apocynum (Fluidextract of Canada-hemp). Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Belladonna Root. Gives assay, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Berberis. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Calumba. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Caulophyllum (Fluidextract of Blue Cohosh). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Chionanthus. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Cimicifuga (Fluidextract of Black Cohosh). Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Colchicum Corm. Gives assay, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Convallaria (Fluidextract of Lily-of-the-valley Root). Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Cotton Root Bark. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Dioscorea. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Echinacea. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and the National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Euonymus. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Gelsemium. Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Gentian. Gives alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Hydrangea. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Hydrastis (Fluidextract of Goldenseal or Extractum Hydrastidis Fluidum P. I.). Gives assay, alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Jalap. Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Krameria (Fluidextract of Rhatany). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Lappa (Fluidextract of Burdock Root). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Leptandra (Fluidextract of Culversroot). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition , 1942. Fluidextract of Phytolacca (Fluidextract of Pokeroot). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Rhubarb. Gives alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Sanguinaria (Fluidextract of Bloodroot). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Seneca (Fluidextract of Seneca-Snakeroot). Gives alcohol content, preparations, and average dose.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Serpentaria. Gives alcohol content, average dose, and preparation.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Squill. Gives alcohol content, preparations, and average dose.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Stillingia. Gives alcohol content, average dose, and preparation.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Taraxacum (Fluidextract of Dandelion Root). Gives alcohol content, preparations, and average dose.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Trillium (Fluidextract of Bethroot). Gives alcohol content, preparation, and average dose.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Triticum (Fluidextract of Couchgrass). Gives alcohol content, average dose, and preparation.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Valerian. Gives alcohol content, average dose, and preparation.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Viburnum Prunifolium (Fluidextract of Blackhaw). Gives alcohol content, preparation, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Ginger. Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Glycyrrhiza (Fluidextract of Licorice Root). Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Ipecac. Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Sarsaparilla. Preparation and alcohol content.

818.32 Fluidextract of Fruits and Seeds

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Celery Fruit. Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Colchicum Seed. Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Cubeb. Gives the assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Guarana. Gives assay, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Juniper. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Nux Vomica. Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Oat. Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Rhamnus Cathartica (Fluidextract of Buckthorn-Berries). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Serenoa (Fluidextractum Sabal, N.F. VI). Gives alcohol content, preparation, and average dose.

818.33 Fluidextract of Leaves and Flowers

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Fluidextract of Buchu. Gives chemical composition, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Arnica. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Belladonna Leaf. Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Buchu. Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Calendula (Fluidextract of Marigold). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Castanea (Fluidextract of Chestnut Leaves). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Damiana. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Grindelia. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Hamamelis Leaf (Fluidextract of Witch-Hazel Leaves). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Hyoscyamus (Fluidextract of Henbane). Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Lobelia. Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Rose. Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Stramonium. Gives assay, alcohol content, average dose, and preparation.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Thyme. Gives alcohol content, preparation, and average dose.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Trifolium (Fluidextract of Red Clover Blossoms). Gives alcohol content, average dose, and preparation.

The American Pharamceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Uva Ursi. Gives alcohol content, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Eriodictyon (Fluidextract of Yerba Santa). Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Senna. Preparation and alcohol content.

818.34 Fluidextract of Barks and Stems

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Condurango. Covers alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Frangula (Fluidextract of Buckthorn Bark). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Quassia. Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Viburnum Opulus (Fluidextract of True Cramp Bark). Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Viburnum Prunifolium (Fluidextract of Blackhaw). Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Wild Cherry. Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Xanthoxylum (Fluidextract of Prickly-Ash Bark). Gives alcohol content, preparation, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Fluidextract of Cascara Sagrada (Aromatic Fluidextract of Rhamnus Purshiana). Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Cascara Sagrada (Fluidextract of Rhamnus Purshiana). Preparation and alcohol content.

818.39 Miscellaneous Fluidextracts

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Euphorbia Pilulifera. Gives alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Humulus (Fluidextract of Hops). Gives alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Kola. Gives assay, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidextract of Zea (Fluidextract of Corn-Silk). Gives alcohol content, preparation, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluidextract of Ergot. Preparation and alcohol content.

818.4 SOLUTIONS

818.41 Acid Solutions

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Boric Acid. Gives chemical composition, preparation, description, identification, reaction, arsenic, heavy metals, assay, storage, and dilution for ophthalmic use.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Arsenious Acid (Hydrochloric Solution or Arsenic, Solution of Arsenic Chloride). Description, identification, reaction, assay, and storage.

818.42 Ammonia Solutions

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammoniacal Solution of Silver Nitrate. Gives chemical composition, description, specific gravity, identifications, reaction, copper, potassium and sodium, assay for silver and for ammonia, storage, oral use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ammonium Acetate. Gives chemical compositions, description, identification, ash, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Iron and Ammonium Acetate (Basham's Mixture). Gives chemical composition, description, identifications, reaction, assay for ammonia and for iron, storage, alcohol content, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diluted Solution of Ammonia (Solution of Ammonium Hydroxide). Description, specific gravity, identification, reaction, nonvolatile substances, heavy metals, oxidizable substances, assay, and storage. U.S.P. product of diluted solution of ammonia—Spiritus Ammoniae Aromaticus.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strong Solution of Ammonia (Stronger Ammonia Water). Description, specific gravity, reaction, other tests, assay, and storage. U.S.P. product of strong solution of ammonia—Liquor Ammoniae Dilutus.

818.43 Hydroxide Solutions

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Potassium Hydroxide. Gives chemical composition, description, specific gravity, identification, reaction, arsenic, assay, storage, preparations, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of calcium Hydroxide (Lime Water). Description, identification, reaction, alkalies and other carbohates, assay, and storage.

818.44 Formaldehyde Solutions

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Formaldehyde. Description, solubility, identification, free acid, assay, and storage.

References.—Aldehydes, *see* 824.

818.45 Hydrogen Peroxide Solutions

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Hydrogen Peroxide (Solution of Hydrogen Dioxide). Description, specific gravity, identification, reaction, nonvolatile matter, acidity, arsenic, barium, heavy metals, limit of preservative, assay, and storage.

818.46 Iodine and Iodide Solutions

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phenolated Solution of Iodine (Carbolized Solution of Iodine). Gives chemical composition, description, specific gravity, identification, free iodine, ash, storage, external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Arsenic and Mercuric Iodides (Donovan's Solution). Gives chemical composition, description, identifications, assay for arsenic triiodide and for mercuric iodide, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Potassium Iodide. Gives chemical composition, description, specific gravity, identification, reaction, other tests, assay, storage, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Iodine. Description, identification, assay for iodine, assay for sodium iodide, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strong Solution of Iodine (Lugol's Solution). Description, identification, assay, and storage.

818.47 Sodium Solution

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Solution of Sodium Borate (Dobell's Solution). Gives chemical composition, description, identifications, reaction, storage, use on mucous membranes, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Diluted Solution of Sodium Hypochlorite (Modified Dakin's Solution). Gives chemical composition, description, specific gravity, total solids, alkalinity, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Sodium Arsenate. Gives chemical composition, description, identification, reaction, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Sodium Citrate (Potio Riverii, Mistura Sodii Citratis). Gives chemical composition, description, identifications, reaction, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Sodium Phosphate. Gives chemical composition, description, specific gravity, identification, reaction, arsenic, heavy metals, assay, storage, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Anticoagulant Solution of Sodium Citrate. Description, identification, hydrogen ion concentration, limit of sodium chloride, assay for sodium citrate, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Isotonic Solution of Sodium Chloride (Physiological Salt Solution, Normal Saline Solution). Description, hydrogen ion concentration, identification, heavy metals, arsenic, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution Sodium Hypochlorite. Description, identification, assay, and storage.

818.49 Miscellaneous Solutions

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Alkaline Aromatic Solution. Gives chemical composition, description, specific gravity, ash, reaction, storage, alcohol, oral use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Caramel (Saccharum Ustum or Burnt Sugar Coloring). Gives description, miscibility, specific gravity, purity, ash, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Chloroformic Solution of Coal Tar. Gives chemical composition, description, storage, external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Diluted Solution of Lead Subacetate (Lead Water). Gives chemical composition, description, identifications, reaction, copper or iron, assay, storage, and external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. N. F. Antiseptic Solution. Gives chemical composition, description, specific gravity, reaction, quantitative test for boric acid and test for antiseptic value, storage, alcohol content, external or oral use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Solution of Aluminum Acetate (Burow's Solution). Gives chemical compositions, preparation for each composition, description, specific gravity, identification, hydrogen-ion concentration, lead, limit for boric acid, assay for aluminum oxide and for acetic acid, storage, and average dilution for external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Aluminum Chloride. Gives chemical composition, description, specific gravity, identification, assay, storage, and external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Aluminum Subacetate. Gives chemical composition, description, identification, reaction, limit for boric acid, assay for aluminum oxide and for acetic acid, storage, average dilution for external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Carmine. Gives chemical composition, description, specific gravity, ash, lead precipitate residue, absence of coal-tar dyes, color standard, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Coal Tar (Liquor Carbonis Detergens). Gives chemical composition, description, identification, storage, alcohol content, average dilution for external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Cochineal (Cochineal Color). Gives chemical composition, description, identification, absence of coal-tar dyes, color standard, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ephedrine Sulfate. Gives chemical composition, preparation, description, optical rotation, identifications, reaction, assay, storage, and average dilution for use on mucous membranes.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ferric Chloride (Solution of Iron Perchloride). Gives chemical composition, description, miscibility, specific gravity, identification, alkali and alkaline earth salts, nitrate, ferrous salts, zinc or copper, assay for hydrochloric acid and for iron, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ferric Subsulfate (Solution of Basic Ferric Sulfate). Gives chemical composition, description, miscibility, specific gravity, identification, reaction, nitrate, ferrous salts, assay, storage, average dose, external use as a styptic, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ferric Sulfate (Solution of Iron Tersulfate). Gives chemical composition, description, miscibility, specific gravity, identification, nitrate, ferrous iron, assay, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Lead Subacetate (Goulard's Extract). Gives chemical composition, description, specific gravity, identifications, reaction, alkaline earths, copper or iron, assay, storage, preparations, and average dilution for external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Merbromin. Gives chemical composition, description, identifications, bromine ions, mercury ions; assay for merbromin, for bromine, and for mercury; and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Methylrosaniline Chloride (Solution of Crystal Violet). Gives chemical composition, description, residue, storage, alcohol content, external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Nux Vomica Alkaloids. Gives chemical composition, description, identifications, reaction, assay for total alkaloidal salts and for strychnine sulfate and brucine sulfate, storage, average dose (metric or apothecaries) for horses and cattle and for sheep and swine, based on weight of the animal, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Peptonized Iron. Gives chemical composition, description, specific gravity, identifications, assay, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Peptonized Iron and Manganese. Gives chemical composition, description, specific gravity, identifications, assay for iron, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Potassium Citrate. Gives chemical composition, description, identification, reaction, tartrate, arsenic, heavy metals, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Procaine Hydrochloride. Gives chemical composition, description, identifications, assay, storage, preparation, and average parenteral dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Solution of Resorcin Brown. Gives chemical composition, description, identification, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Soda and Mint. Gives chemical composition, description, identifications, reaction, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Sulfurated Lime (Vlemincks' Lotion). Gives chemical composition, description, identifications, reaction, storage, average dilution for external use, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Surgical Solution of Merbromin. Gives chemical composition, preparation, description, identification, distinction from solution of merbromin, bromine ions, mercury ions, assay for each, total solids, bromine and mercury, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Isotonic Solution of Three Chlorides (Ringer's Solution). Description, hydrogen ion concentration, heavy metals, arsenic, assay for calcium chloride, assay for potassium chloride, assay for total chlorides, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Saponated Solution of Cresol (Compound Solution of Cresol). Characteristics of the liberated fatty acids, assay, storage, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Amaranth. Description, residue, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Chloroazodin. Description, specific gravity, identification, moisture, assay for chloroazodin, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Epinephrine Hydrochloride. Description, identification, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S, A., Twelfth Revision, 1942. Solution of Liver (Liquid Extract of Liver). Alcoholic and glycerin content and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Magnesium Citrate. Description, identification, chloride, sulfate, tartaric acid, minimum of total citric acid, and assay for magnesium oxide.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Potassium Arsenite (Fowler's Solution). Description, identification, arsenate, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Tribromoethanol (Solution of Tribromoethyl Alcohol). Description, free acid, assay, and storage.

818.5 SPIRITS

818.51 Ammonia Spirits

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Anisated Spirit of Ammonia. Gives chemical composition, storage, alcohol content, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Spirit of Ammonia. Description, specific gravity, assay for total ammonia, assay for normal ammonium carbonate, alcohol content, and storage.

818.52 Orange Spirits

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Spirit of Orange. Preparation, assay, alcohol content, and storage.

818.53 Camphor Spirits

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Camphor. Specific gravity, added water, assay, alcohol content, and storage.

818.54 Cinnamon Spirits

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Cinnamon. Preparation, assay, alcohol content, and storage.

818.55 Whiskey

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Whisky (Whiskey). Description, specific gravity, free acid (total solids, glycerin, sugar), storage in wood, esters (acetone, other ketones, isopropyl alcohol, and tertiary butyl alcohol), alkaloids, caramel and certain coal-tar dyes, formaldehyde, methanol, heavy metals, and storage.

818.56 Lavender Spirits

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Lavender. Preparation, assay, alcohol content, and storage.

818.57 Brandy

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Brandy. Description, specific gravity, free acid, total solids, storage in wood, other tests, and storage.

818.59 Miscellaneous Spirits

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Spirit of Cardamom. Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Spirit of Ether (Hoffmann's Anodyne). Gives chemical composition, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Spirit of Myrcia. Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Spirit of Vanillin. Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Perfumed Spirit (Cologne Water or Aqua Coloniensis). Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Spirit of Benzaldehyde. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Spirit of Chloroform. Gives chemical composition, assay, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Spirit of Ether (Hoffmann's Drops). Gives chemical composition, description, miscibility, specific gravity, reaction, residue, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Spirit of Ethyl Nitrite (Spirit of Nitrous Ether or Sweet Spirit of Nitre). Gives chemical composition, description, specific gravity, identification, reaction, free acid, aldehyde, assay, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Spirit of Formic Acid. Gives chemical composition, identification, purity, assay, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Spirits of Volatile Oils. Gives chemical composition and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Anise. Preparation, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Glyceryl Trinitrate (Spirit of Nitroglycerin). Description, specific gravity, identification, reaction, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Peppermint (Essence of Peppermint). Preparation, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spirit of Spearmint. Preparation, assay, alcohol content, and storage.

818.6 SYRUPS

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup (Sirup, Simple Syrup). Preparation, specific gravity, and storage.

818.60 General Items

818.61 Acid Syrups

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Citric Acid. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Hydriodic Acid. Preparation, description, specific gravity, identification, free iodine, assay, and storage.

818.62 Orange Syrups

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Orange. Preparation, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Orange Flowers. Preparation and storage.

818.63 Ipecac Syrups

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Ipecac. Preparation, alcohol content, and storage.

818.64 Pine Tar Syrups

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Pine Tar (Syrup of Tar). Preparation and storage.

818.65 Cherry Syrups

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Cherry. Gives chemical composition, storage, alcohol content, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Wild Cherry. Preparation, alcohol content, and storage.

818.66 Sarsaparilla Syrups

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Syrup of Sarsaparilla. Preparation, alcohol content, and storage.

818.67 Senna Syrups

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Senna. Preparation, alcohol content, and storage.

818.68 Honey

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Honey (Clarified Honey, Strained Honey). Description, specific gravity, ash, reaction, chloride, sulfate, artificial honey, foreign coloring matter, azo dyes, starch or dextrins, free acid, and storage.

818.69 Miscellaneous Syrups

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aromatic Syrup of Eriodictyon (Syrupus Corrigens or Aromatic Syrup of Yerba Santa). Gives chemical composition, storage, alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Syrup of Asarum. Gives chemical composition, preparation, storage, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Syrup of Hypophosphites. Gives chemical composition, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound syrup of Squill (Hive Syrup). Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Syrup of White Pine. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Syrup of White Pine With Codeine. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Acacia. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Althea. Gives chemical composition, preparation, storage, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Ammonium Hypophosphite. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of the Bromides. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Cacao (Cocoa Syrup of Chocolate-Flavored Syrup). Gives chemical composition, preparation, storage, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Calcium Lactophosphate. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Cinnamon. Gives chemical composition, storage, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Ephedrine Sulfate. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Ferrous Iodide. Gives chemical composition, description, specific gravity, identifications, free iodine, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Ginger. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Hypophosphites. Gives chemical composition, storage, average dose, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Ipecac and Opium (Syrup of Dover's Powder). Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Potassium Guaiacolsulfonate. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Raspberry. Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Rhubarb. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Senega. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Squill. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Thyme. Gives chemical composition, storage, alcohol content, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Syrup of Rhubarb. Preparation, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Liquid Glucose (Glucose). Description, solubility, identification, loss on drying, ash, acidity, sulfite, arsenic, heavy metals, starch, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Glycyrrhiza (Syrup of Licorice). Preparation, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Syrup of Tolu Balsam (Syrup of Tolu). Preparation, alcohol content, and storage.

818.7 TINCTURES

818.70 General Items

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ethereal Tinctures. Gives chemical composition and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tinctures. Gives definition, processes for percolation and maceration, preparation of tinctures from fluidextracts, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tinctures of Fresh Drugs. Gives chemical composition and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tinctures. Alcoholic or hydro-alcoholic solutions prepared from animal or vegetable drugs or from chemical substances, process P; modification for assayed tinctures, process M; and storage.

818.71 Tincture of Orange Peel

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Bitter Orange Peel. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Sweet Orange Peel. Preparation and alcohol content. U.S.P. product of tincture of sweet orange peel—Syrupus Aurantii.

818.72 Tincture of Belladonna

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Belladonna (Tincture of Belladonna Leaf). Preparation, assay, and alcohol content.

818.73 Tincture of Gentian

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Tincture of Gentian. Preparation and alcohol content.

818.74 Tincture of Iodine

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Stronger Tincture of Iodine (Churchill's Tincture of Iodine). Gives chemical composition, preparation, assay for potassium iodide and for iodine, alcohol content, and external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Iodides. Gives chemical composition, preparation, alcohol content, and external use.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mild Tincture of Iodine. Description, identification and assays, storage, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Iodine. Description, identification, assay, storage, and alcohol content.

818.75 Tincture of Lemon

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Lemon. Preparation and alcohol content. U.S.P. product of tincture of lemon—Syrupus Acidi Citrici.

818.76 Tincture of Nux Vomica

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Nux Vomica. Preparation, assay, and alcohol content.

818.77 Tincture of Opium

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Mixture of Opium and Glycyrrhiza (Brown Mixture). Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Ipecac and Opium (Tincture of Dover's Powder). Gives chemical composition, alcohol content, preparation, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Camphorated Tincture of Opium (Paregoric). Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Opium (Laudanum, Tincture of Deodorized Opium). Preparation, assay, and alcohol content.

818.79 Miscellaneous Tinctures

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Hahnemann's Causticum and St. Mary's Thistle. Synonyms, description, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Acetic Tincture of Larkspur. Gives chemical composition, preparation, alcohol content, and external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammoniated Tincture of Guaiac. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammoniated Tincture of Valerian. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Compound Tincture of Cinchona. Gives chemical composition, preparation, assay, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Tincture of Cudbear. Gives chemical composition, preparation, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Tincture of Gambir. Gives chemical composition, preparation, alcohol content, and average dose..

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Tincture of Viburnum. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Strong Tincture of Colchicum Corm. Gives chemical composition, preparation, assay, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sweet Tincture of Rhubarb. Gives chemical composition, preparation, alcohol content and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Aconite. Gives chemical composition, preparation, assay, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Aloe. Gives chemical composition, identification, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Aloe and Myrrh. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Antimony (Tincture of Tartar Emetic). Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Arnica. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Asafetida. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Bryonia. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Cactus Grandiflorus. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Calendula. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Calumba. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Cantharides. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Capsicum. Gives chemical composition, preparation, test for quality, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Capsicum and Myrrh (Hot Drops). Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Cimicifuga (Tincture of Black Cohosh). Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Cinnamon. Gives chemical composition, alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Cocculus. Gives chemical composition, preparation, alcohol content, and external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Cubeb. Gives chemical composition, preparation, assay, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Cudbear. Gives chemical composition, assay for color, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Ferric Chloride (Tincture of Iron). Gives chemical composition, description, specific gravity, identifications, nitrate, assay, alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Ferric Citrochloride. Gives chemical composition, assay, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Gelsemium. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Guaiac. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Hydrastis (Tincture of Goldenseal). Gives chemical composition, preparation, assay, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Ipecac. Gives chemical composition, preparation, assay, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Ipecac and Opium (Tincture of Dover's Powder). Gives chemical composition, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Jalap. Gives chemical composition, preparation, assay, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Kino. Gives chemical composition, preparation, storage, alochol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Larkspur. Gives chemical composition, preparation, alcohol content, and external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Lobelia. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Pulsatilla. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Quassia. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Quillaja (Tincture of Soapbark). Gives chemical composition, preparation, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Rhubarb. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Sanguinaria (Tincture of Bloodroot). Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Serpentaria (Tincture of Virginia Snakeroot). Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Squill. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Strophanthus. Gives chemical composition, preparation, assay, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Valerian. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Vanilla. Gives chemical composition, preparation, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Veratrum Viride. Gives chemical composition, preparation, alcohol content, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Tincture of Rhubarb. Preparation and alcohol content, U.S.P. product of aromatic tincture of rhubarb—Syrupus Rhei Aromaticus.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Tincture of Cardamom. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Tincture of Lavender (Compound Spirit of Lavender). Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Benzoin. Preparation and alcohol content. Compound Tincture of Benzoin. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Colchicum Seed (Tincture of Colchicum). Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Digitalis. Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of

Hyoscyamus (Tincture of Henbane). Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Myrrh. Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Stramonium. Preparation, assay, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tincture of Tolu Balsam (Tolu Tincture). Preparation and alcohol content. U.S.P. product of tincture of tolu balsam—Syrupus Balsami Tolutani.

818.8 ELIXIRS

818.81 Elixir of Iron

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Beef and Iron. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Gentian and Iron. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Iron, Quinine, and Strychnine Phosphates. Gives chemical composition, preparation, storage, alcohol content, and average dose.

818.82 Aromatic Elixirs

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Red Aromatic Elixir. Gives chemical composition, storage, and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Elixir (Simple Elixir). Description, alcohol content, and storage.

818.83 Elixir of Bismuth

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Bismuth. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin and Bismuth. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin, Bismuth, and Strychnine. Gives chemical composition, storage, alcohol content, average dose, and preparation.

818.84 Elixirs of Botanical Origin

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Alkaline Elixir of Rhubarb. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Buchu. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Cardamom. Gives chemical composition, preparation, storage, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Euphorbia (Hare's Elixir). Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Hydrastis (Alkaline Elixir). Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Serenoa and Sandalwood (Compound Elixir of Saw Palmetto and Santal or Sabal-Santal Elixir). Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Taraxacum. Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Vanillin. Gives chemical composition, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Viburnum Opulus. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Bitter Orange (Elixir Curassao). Gives chemical composition, preparation, storage, and alcohol content.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Buchu. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Buchu and Potassium Acetate. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Buchu, Juniper, and Potassium Acetate. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Cascara Sagrada.

Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Cataria and Fennel. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Cinchona Alkaloids (Elixir Calisaya, Alkaloidal). Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Gentian. Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Gentian and Iron. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Glycyrrhiza (Elixir of Licorice). Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Guarana and Celery. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Hydrangea and Lithium. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Iron, Quinine, and Strychnine. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Iron, Quinine, and Strychnine Phosphates. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin, Bismuth, and Strychnine. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Viburnum Prunifolium (Elixir of Blackhaw). Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerinated Elixir of Gentian. Gives chemical composition, storage, alcohol content, and preparation.

818.85 Elixirs of Animal Origin

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Pepsin (Elixir Lactated Pepsin or Compound Digestive Elixir). Gives chemical composition, assay, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Beef and Iron. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin. Gives chemical composition, assay, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin and Bismuth. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin and Rennin. Gives chemical composition, preparation, assay, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin, Bismuth, and Strychnine. Gives chemical composition, storage, alcohol content, average dose, and preparation.

818.86 Elixir of Potassium

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Buchu, Juniper, and Potassium Acetate. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Buchu and Potassium Acetate. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Potassium Bromide. Gives chemical composition, assay, storage, alcohol content, preparation, and average dose.

818.87 Elixir of Sodium

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Sodium Salicylate. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Calcium and Sodium Glycerophosphates. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Elixir of Sodium Bromide. Gives chemical composition, assay, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Sodium Salicylate. Gives chemical composition, assay, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Sodium Thiocyanate (Elixir of Sodium Sulfocyanate). Gives chemical composition, storage, alcohol content, preparation, and average dose.

818.89 Miscellaneous Elixirs

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Benzaldehyde. Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Glycerophosphates. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Aminopyrine. Gives chemical composition, assay, alcohol content, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of. Ammonium Bromide. Gives chemical composition, preparation, assay, alcohol content, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Ammonium Valerate. Gives chemical composition, preparation, alcohol content, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Barbital. Gives chemical composition, preparation, assay, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Calcium Lactophosphate. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Five Bromides. Gives chemical composition, preparation, assay, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Sev enth Edition, 1942. Elixir of Phosphorus. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Terpin Hydrate. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Terpin Hydrate and Codeine. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Three Bromides. Gives chemical composition, preparation, assay, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Iso-Alcoholic Elixir. Gives chemical compositions for low-alcoholic and high-alcoholic elixirs, storage, alcohol contents, and table for adjustment of iso-alcoholic elixir.

818.9 MISCELLANEOUS LIQUIDS

818.91 Decoctions

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Decoctions. Preparation.

818.92 Sprays

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aromatic Spray. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Spray of Ephedrine (Compound Ephedrine Inhalant). Gives chemical composition, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Spray of Menthol. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ephedrine Spray. Gives chemical composition, assay, storage, and preparation.

818.93 Juices

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Aloes, Lettuce Opium, Murex, Squirting Cucumber, and Sugar Pine. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cherry Juice. Gives chemical composition, description, specific gravity, refractive index, ash, hydrogen-ion concentration, total solids, reducing sugars, volatile acids, arsenic, lead, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Kino. Gives descriptions of unground and powdered kino, identification, descriptions of alcohol-soluble extractive and water-soluble extractive, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Raspberry Juice. Gives chemical composition, description, specific gravity, refractive index, identification, ash, hydrogen-ion concentration, total solids, reducing sugars, volatile acids, absence of coal-tar dyes, arsenic, assay, storage, and preparation.

818.94 Glycerites

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Fluidglycerates. Gives chemical composition and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Bismuth. Gives chemical composition, description, specific gravity, assay, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Egg Yolk (Glyconin). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Iodine and Zinc Iodide (Diluted Talbot's Solution). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Pepsin. Gives chemical composition, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Phenol (Glycerite of Carbolic Acid). Gives chemical composition, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Tragacanth. Gives chemical composition, storage, and preparation.

818.95 Infusions

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Infusion of Gentian. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Infusion of Digitalis. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Infusion of Senna With Magnesium Sulfate. Gives chemical composition, preparation, storage, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Infusions. Description.

819. MISCELLANEOUS MEDICINAL AND PHARMACEUTICAL PREPARATIONS

819.0 GENERAL ITEMS

American Society for Testing Materials, E 20-33 T; 1933. Tentative Method of Test for Particle Size Distribution of Subsieve Size Particulate Substances. Covers the range of sizes between the 74-micron (No.200) sieve and 0.2-micron. The method is applicable to homogeneous materials. Definitions, rough separation of sample into size groups, preparation of mount, procedure, measurement of diameter, scale limits for measurement, and expression of results.

819.1 POWDERS

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Chrysarobin and Lupulin. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Magnesia, Osmium, and Solanine. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aromatic Powder. Gives chemical composition, description, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aromatic Powder of Chalk. Gives chemical composition, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Powder of Jalap. Gives chemical composition, description, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Powder of Pancreatin (Peptonizing Powder). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Powder of Rhubarb (Gregory's Powder). Gives chemical composition, description, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound powder of Senna (Compound Licorice Powder). Gives chemical composition, description, identification, sulfide, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Powder of Zinc Sulfate. Gives chemical composition, test for antiseptic value, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Powder of Ipecac and Opium (Dover's Powder). Gives chemical composition, description, storage, average dose, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aloe. Description, identification, alcohol-insoluble matter, and assay. U.S.P. product of aloe—Aloinum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aloin. Description, solubility, identification, ash, reaction, emodin, water-insoluble substances, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cascara Sagrada. Description and identification. U.S.P. products of cascara sagrada—Extractum Cascarae Sagradae, Fluidextractum Cascarae Sagradae, Fluidextractum Cascarae Sagradae Aromaticum, Tabellae Cascarae Sagradae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chiniofon. Description, solubility, identification, free iodine, iodide, assay, and storage. U.S.P. product of chiniofon—Tabellae Chiniofoni.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chrysarobin. Description, solubility, identification, ash, reaction, and storage. U.S.P. product of chrysarobin—Unguentum Chrysarobini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Chalk Powder. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Effervescent Powders (Seidlitz Powders). Identification, assay for sodium bicarbonate, assay for potassium and sodium tartrate, assay for tartric acid, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Digitalis Capsules. Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dihydromorphinone Hydrochloride. Description, solubility, identification, loss on drying, ash, sulfate, ammonium salts, codeine, acidity, and storage. U.S.P. product of dihydromorphinone hydrochloride— Tabellae Dihydromorphinoni Hydrochloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diphenylhydantoin Sodium. Description, solubility, identification, reaction, loss on drying, clarity and color of solution, chloride, sulfate, heavy metals, assay, and storage. U.S.P. product of diphenylhydantoin sodium—Capsulae Diphenylhydantoini Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dried Aluminum Hydroxide Gel. Description, solubility, identification, reaction, acid-consuming capacity, chloride, sulfate, assay, and storage. U.S.P. product of dried aluminum hydroxide gel—Gelatum Alumini Hydroxidi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Epinephrine. Description, solubility, optical rotation, identification, loss on drying, ash, reaction, vegetable alkaloids, and storage. U.S.P. products of Epinephrine—Injectio Epinephrinae Hydrochloridi, Liquor Epinephrinae Hydrochloridi, Nebula Epinephrinae Hydrochloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ergonovine Maleate. Description, solubility, melting point, optical rotation, identification, loss on drying, ergotoxine and ergotamine, assay, and storage. U.S.P. product of ergonovine maleate—Tabellae Ergonovinae Maleatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Estradiol Benzoate. Description, solubility, melting point, optical rotation, identification, completeness and reaction of solution, ash, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Eucaine Hydrochloride (Betaeucaine Hydrochloride). Description, solubility, identification, loss on drying, cocaine hydrochloride, ash, carbonizable substances, reaction, cocaine and alphaeucaine, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U.S.A., Twelfth Revision, 1942. Eucatropine Hydrochloride. Description, solubility, melting point, identification, ash, reaction, atropine, scopolamine or hyoscyamine, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Exsiccated Sodium Phosphate (Dried Sodium Phosphate). Description, solubility, identification, loss on drying, other tests, assay, and storage. U.S.P. product of exsiccated sodium phosphate—Sodii Phosphas Effervescens.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Exsiccated Sodium Sulfite. Description, solubility, identification, reaction, thiosulfate, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Stramonium. Pilular Extract of Stramonium. Assay. Powdered Extract of Stramonium. Assay and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluorescein Sodium (Soluble Fluorescein). Description, solubility, identification, loss on drying, chloride, sulfate, zinc, acriflavine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Lactose (Milk Sugar). Description, solubility, optical rotation, identification, ash, reaction, heavy metals, dextrose, sucrose, starch or dextrin, water-insoluble substances, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neocinchophen. Description, solubility, melting point, identification, loss on drying, ash, cinchophen, and storage. U.S.P. product of neocinchophen—Tabellae Neocinchopheni.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neostigmine Bromide. Description, solubility, melting point, identification, loss on drying, ash, reaction, sulfate, assay, and storage. U.S.P. product of neostigmine bromide—Tabellae Neostigminae Bromidi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neostigmine Methylsulfate. Description, solubility, melting point, identification, loss on drying, ash, reaction, chloride, sulfate ion, assay, and storage. U.S.P. product of neostigmine methylsulfate—Injectio Neostigminae Methylsulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nicotinamide (Nicotinic Acid Amide, Niacinamide). Description, solubility, melting point, identification, loss on drying, carbonizable substances, reaction, heavy metals, assay, and storage. U.S.P. product of nicotinamide—Tabellae Nicotinamidi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pamaquine Naphthoate (Aminoquin Naphthoate). Description, solubility, identification, loss on drying, assay for methylene, assay for pamaquine base, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pelletierine Tannate. Description, solubility, identification, ash, carbonizable substances, reaction, foreign alkaloids, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenolphthalein. Description, solubility, melting point, identification, loss on drying, ash, arsenic, heavy metals, colored substances, fluorane, sensitiveness, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenolsulfonphthalein (Phenol Red). Description, solubility, identification, loss on drying, ash, arsenic, insoluble substances, sensitiveness, and storage. U.S.P. product of phenolsulfonphthalein—Injectio Phenolsulfonphthaleini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenyl Salicylate (Salol). Description, solubility, melting point, identification, loss on drying, ash, free acid, free phenol or salicylic acid, chloride, sulfate, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Posterior Pituitary (Pituitary, Hypophysis Sicca). Description, solubility, assay, and storage. U.S.P. product of posterior pituitary—Injectio Pituitarii Posterioris.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Carbonate. Description, solubility, identification, loss on drying, insoluble substances, reaction, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Powdered Digitalis. Description and physical properties, assay, and storage. U.S.P. products of digitalis—*See* Digitalis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Powdered Opium. Preparation, description, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Precipitated Sulfur. Description, solubility and identification, loss on drying, residue on ignition, acid or alkali, arsenic, other forms of sulfur, assay, and storage. U.S.P. product of precipitated sulfur—Unguentum Sulfuris.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Purified Talc. Description, identification, loss on ignition, acid-soluble substances, reaction and soluble substances, water-soluble iron, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinacrine Hydrochloride (Mepacrine Hydrochloride). Description, solubility, identification, loss on drying, ash, hydrogen-ion concentration, assay, and storage. U.S.P. product of quinacrine hydrochloride—Tabellae Quinacrinae Hydrochloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Quinine Dihydrochloride. Description, solubility, identification, loss on drying, ash, carbonizable substances, sulfate, barium, other cinchona alkaloids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Benzoate. Description, solubility, identification, loss on drying, alkalinity, heavy metals, chlorinated compounds, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Bicarbonate (Baking Soda). Description, solubility, identification, insoluble substances, reaction, carbonate, ammonia, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Nitrite. Description, solubility, identification, loss on drying, reaction, heavy metals, assay, and storage. U.S.P. product of sodium nitrite—Tabellae Sodii Nitritis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Stearate. Description, solubility, identification, loss on drying, alcohol-insoluble substances, reaction, free alkali and free acids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strophanthin. Description, solubility, identification, ash, reaction, assay, and storage. U.S.P. product of strophanthin—Injectio Strophanthini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sublimed Sulfur (Flowers of Sulfur). Description, solubility, identification, residue on ignition, arsenic, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfarsphenamine. Description, solubility, identification, completeness of solubility, thermostability, assay, storage, and labeling.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfobromophthalein Sodium. Description, solubility, identification, loss on drying, sensitiveness, color and completeness of solution, halide ion, sulfate, arsenic, and storage. U.S.P. product of sulfobromophthalein sodium—Injectio Sulfobromophthaleini Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tetracaine Hydrochloride. Description, solubility, melting point, identification, loss on drying, ash, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline. Description, solubility, melting point, identification, loss on drying, ash, reaction, carbonizable substances (difference from caffeine, theobromine, or paraxanthine), and storage. U.S.P. product of theophylline—Tabellae Theophylline.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tribromoethanol (Tribromoethyl Alcohol). Description, solubility, melting point, identification, loss on drying, ash carbonizable substances, reaction, halogen ions, sulfate, aldehyde, assay, and storage. U.S.P. product of tribromoethanol—Liquor Tribromoaethanolis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Triturations. Preparation.

References.—Other alkaloids, *see* 811, Food and Drugs Act and Regulations, *see* 810.

819.2 PREPARATIONS IN TUBES

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1075A; 1941. Ointments in Collapsible Tubes.

819.3 IODUM-POTASSII

References.—Food and Drugs Act and Regulations, *see* 810.

819.4 MEDICINALS OF ANIMAL ORIGIN

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ambergris, Bird Spider, Black Spider of Curacoa, Castor, Cochineal, Coral Snake, Cuban Tarantula, Diadem Spider, Honey Bee, Honey Bee Poison, Lachesis, Musk, Naja, Rattlesnake, Red Coral, Sepia, Skunk-Poison, Spanish Fly, Star Fish, Tarantula, and Thyroid Gland. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Anterior Pituitary. Gives chemical composition, description, histology, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cantharides Cerate (Blistering Cerate). Gives chemical composition, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cantharides (Spanish Flies, Russian Flies, or Pulvis Cantharidis P.I.). Gives chemical composition, description of unground cantharides and powdered cantharides, mylabris beetles, moisture, assay, preparations, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Carmine. Gives description, solubility, loss on drying, ash, tin, lead, and soluble barium compounds; insoluble barium salts; storage and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Pepsin (Elixir Lactated Pepsin or Compound Digestive Elixir). Gives chemical composition, assay, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Powder of Pancreatin (Peptonizing Powder). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Corpus Luteum. Gives preparation, description, solubility, histological characters, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Egg (Hen's Egg). Gives preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Egg Yolk. Gives preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Beef and Iron. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin. Gives chemical composition, assay, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin and Bismuth. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin and Rennin. Gives chemical composition, preparation, assay, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Beef. Gives description, solubility, nitrate, total solids, ash, sodium chloride, alcohol-insoluble solids, assay for nitrogen content of alcohol-soluble substances and for nitrogen as ammonia, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Egg Yolk (Glyconin). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Pepsin. Gives chemical composition, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ovarian Residue. Gives chemical composition, description, solubility, histology, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Ovary. Gives chemical composition, description, solubility, histology, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pepsin. Gives description, solubility, destruction of activity, identification, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Plaster of Cantharides. Gives chemical composition, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Rennin. Gives description, solubility, tests for purity, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Saccharated Pepsin. Gives chemical composition, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Carmine. Gives chemical composition, description, specific gravity, ash, lead precipitate residue, absence of coal-tar dyes, color standard, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee: The National Formulary, Seventh Edition, 1942. Solution of Cochineal (Cochineal Color). Gives chemical composition, description, identification, absence of coal-tar dyes, color standard, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Suprarenal. Gives chemical composition, description, solubility, histology, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Cantharides. Gives chemical composition, preparation, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Whole Pituitary. Gives chemical composition, description, histology, storage, average dose, and preparation.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Pepsin in Liquids. Tentative methods for preparation of sample and reagents and for percentage of pepsin.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Citrated Normal Human Plasma (Normal Human Plasma). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cochineal. Description, identification, weighting materials, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Estrone. Description, solubility, melting point, optical rotation, identification, ash, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Liver (Dry Liver Extract). Description and storage. U.S.P. product of extract of liver—Injectio Hepatis, Liquor Hepatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Ox Bile. Description, solubility, reaction, insoluble substances, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Ox Bile Tablets. Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Gelatin. Description, solubility, identification, odor and water-insoluble substances, sulfite, arsenic, heavy metals, gel strength, bacterial content, and storage. U.S.P. product of gelatin—Gelatinum Glycerinatum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Human Immune Globulin (Measles Prophylactic). Description, regulations, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Insulin Injection (Insulin, Insulin Hydrochloride). Description, identification, reaction, total nitrogen, zinc, ash, assay, blood-sugar determination, interpretation of the data, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Liver Injection (Liver Extract for Parenteral Use). Description, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ox Bile (Oxgall). Description, specific gravity, identification, and reaction. U.S.P. products of ox bile—Extractum Fellis Bovis, Tabellae Extracti Fellis Bovis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pancreatin. Description, solubility, identification, fat, assay for starch digestive power, assay for casein digestive power, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Parathyroid Injection (Solution of Parathyroid, Parathyroid Extract). Assay, determination of serum calcium, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Posterior Pituitary (Pituitary, Hypophysis Sicca). Description, solubility, assay, and storage. U.S.P. product of posterior pituitary—Injectio Pituitarii Posterioris.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Posterior Pituitary Injection (Solution of Posterior Pituitary, Solution of Pituitary). Description, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Powdered Stomach (Dried Stomach). Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Liver (Liquid Extract of Liver). Alcoholic and glycerin content and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Spermaceti. Description, solubility, specific gravity, melting point, paraffin and free acids, stearic acid, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Thyroid. Description, identification, moisture, assay, and storage. U.S.P. product of thyroid—Tabellae Thyroidei.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Thyroid Tablets. Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Thyroxin. Description, solubility, identification, loss on drying, ash, soluble halides, assay, and storage.

References.—Biological medicinal agents, *see* 812; cod liver oil, *see* 813.2; Food and Drugs Act and Regulations, *see* 810.

819.5 VITAMINS

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ascorbic Acid (Vitamin C). Description, solubility, melting point, optical rotation, identification, ash, heavy metals, assay, and storage. U.S.P. product of absorbic acid—Tabellae Acidi Ascorbici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ascorbic Acid Tablets (Vitamin C Tablets). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Concentrated Oleovitamin A and D. Description, free fatty acids, assays, and storage. U.S.P. product of concentrated oleovitamin A and D—Capsulae Oleovitaminae A et D Concentratae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Concentrated Oleovitamin A and D- Capsules (Concentrated Vitamin A and D Capsules). Oil content of capsules, description, tests, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Menadione. Description, solubility, melting point, identification, ash, loss on drying, assay, and storage. U.S.P. product of menadione—Tabellae Menadioni.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Menadione Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nicotinamide (Nicotinic Acid Amide, Niacinamide). Description, solubility, melting point, identification, loss on drying, carbonizable substances, reaction, heavy metals, assay, and storage. U.S.P. product of nicotinamide—Tabellae Nicotinamidi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nicotinamide Tablets (Niacinamide Tablets). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nicotinic Acid. Description, solubility, melting point, identification, loss on drying, ash, chloride, sulfate, heavy metals, assay, and storage. U.S.P. product of nicotinic acid—Tabellae Acidi Nicotinici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nicotinic Acid Tablets (Niacin Tablets). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oleovitamin A and D. Description, solubility, color, free fatty acids, assays, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oleovitamin A Capsules. Oil content of capsules, description, tests, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oleovitamin A (Natural Vitamin A in Oil). Description, free fatty acids, assays, and storage. U.S.P. product of oleovitamin A—Capsulae Oleovitaminae A.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Riboflavin (Lactoflavin, Vitamin B_2, Vitamin G). Description, solubility, melting point, optical rotation, identification, loss on drying, ash, reaction, lumiflavin, nitrogen, and storage. U.S.P. product of riboflavin—Tabellae Riboflavini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Riboflavin Tablets. Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Synthetic Oleovitamin D (Viosterol' in Oil). Description, solubility, free fatty acids, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Thiamine Hydrochloride (Thiamin Chloride, Vitamin B_1 Hydrochloride, Vitamin B_1). Description, solubility, identification, loss on drying, ash, reaction, color of solution, sulfate, ammonium salts, assay for hydrogen chloride, assay for nitrogen, assay for sulfur, and storage. U.S.P. product of thiamine hydrochloride—Tabellae Thiaminae Hydrochloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Thiamine Hydrochloride Tablets (Thiamin Chloride Tablets, Vitamin B_1 Tablets). Identification, assay, storage, and sizes.

819.6 SULFONAMIDES

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Steril Sulfapyridine Sodium (Sterile Sodium Sulfapyridine). Description, solubility, identification, reaction, loss on drying, chloride, sulfate, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfanilamide. Description, solubility, melting point, identification, loss on drying, ash, reaction, chloride, sulfate, heavy metals, assay, and storage. U.S.P. product of sulfanilamide—Tabellae Sulfanilamidi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfanilamide Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfapyridine.

Description, solubility, melting point, identification, loss on drying, ash, clarity and color of solution, acidity, chloride, sulfate, heavy metals, assay, and storage. U.S.P. product of sulfapyridine—Tabellae Sulfapyridini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfapyridine Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfathiazole. Description, solubility, melting point, identification, loss on drying, ash, clarity and color of solution, acidity, chloride, sulfate, heavy metals, assay, and storage. U.S.P. product of sulfathiazole—Tabellae Sulfathiazoli.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfathiazole Tablets. Identification, assay, storage, and sizes.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1124; 1944. Sulfanilamide; Crystalline, U.S.P.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1126; 1944. Sulfadiazine Tablets; 7.7. Grains.

819.7 MEDICINAL EXTRACTS

819.70 General Items

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extracts. Gives description, diluents, defatting, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extracts. Description, diluents, defatting extracts, methods of preparing, and storage.

819.71 Extracts of Roots and Rhizomes

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Gelsemium. Gives average dose and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Gentian. Gives preparation of pilular extract and of powdered extract of gentian and the average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Hydrastis (Extract of Goldenseal or Powdered Extract of Hydrastis). Gives assay, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Leptandra (Extract of Culversroot or Powdered Extract of Leptandra). Gives preparation and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Sumbul (Extract of Musk Root). Gives chemical composition, preparation of pilular extract and powdered extract of sumbul, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Taraxacum (Extract of Dandelion Root). Gives chemical composition, preparation of pilular extract of taraxacum and powdered extract of taraxacum, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Valerian. Gives average dose, chemical composition, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Glycyrrhiza (Extract of Licorice Root, Licorice). Description, insoluble matter, foreign starch, ash, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Rhubarb (Powdered Extract of Rhubarb). Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pure Extract of Glycyrrhiza (Pure Extract of Licorice Root). Description and storage.

819.72 Extracts of Fruits and Seeds

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Extract of Colocynth. Gives chemical composition, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Colocynth (Extract of Bitter Apple or Powdered Extract of Colocynth). Gives preparation and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Nux Vomica (Powdered Extract of Nux Vomica or Extractum Strychni P.I.). Gives chemical composition, preparation, assay, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Malt. Description, solubility, specific gravity, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Rice Polishings. Description, solubility, specific gravity, identification, assay for vitamin B_1, and storage.

819.73 Extracts of Leaves and Flowers

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Aloe. Gives average dose and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Digitalis. Gives assay, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Opium (Powdered Extract of Opium or Extractum Opii Aquosum P.I.). Gives chemical composition, preparation, assay, and average dose.

J. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Belladonna—Pilular Extract of Belladonna. Preparation and assay. Powdered Extract of Belladonna. Preparation and assay. U.S.P. products of extract of belladonna—Unguentum Belladonnae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract Hyoscyamus (Extract of Henbane)—Pilular Extract of Hyoscyamus. Assay. Powdered Extract of Hyoscyamus. Assay and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Stramonium—Pilular Extract of Stramonium. Assay. Powdered Extract of Stramonium. Assay and storage.

819.74 Extracts of Barks and Stems

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Cascara Sagrada (Extract of Rhamnus Purshiana). Preparation.

819.75 Extracts of Animal Origin

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Beef. Gives description, solubility, nitrate, total solids, ash, sodium chloride, alcohol-insoluble solids, assay for nitrogen content of alcohol-soluble substances and for nitrogen as ammonia, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Liver (Dry Liver Extract). Description and storage. U. S. P. product of extract of liver—Injectio Hepatis, Liquor Hepatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Ox Bile. Description, solubility, reaction, insoluble substances, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Extract of Ox Bile Tablets. Assay, storage, and sizes.

819.79 Miscellaneous Extracts

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Curare and Indian Hemp. Natural order, synonyms, description, habitat, history, parts used, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Extract of Ergot. Gives assay, average dose, and preparation.

819.8 PILLS AND TABLETS

819.80 General Items

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills. Gives general directions for preparing pills official in this formulary.

819.81 Bismuth Compounds

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Bismuth Subcarbonate. Gives chemical composition, identification, alkaline earths, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Bismuth Subgallate. Gives chemical composition, identifications, alkaline earths, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Bismuth Subnitrate. Gives chemical composition, identifications, ammonium compounds, assay, and average dose.

819.82 Sodium Compounds

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Caffeine With Sodium Benzoate. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Mild Mercurous Chloride and Sodium Bicarbonate (Calomel and Soda Tablets). Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Procaine Hydrochloride. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Sodium Bicarbonate. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Sodium Bromide. Gives chemical composition, identification, chloride, assay, and average dose.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1109A; 1940. Normal Saline Solution Tablet.

819.83 Calcium Compounds

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Calcium Carbonate. Gives chemical composition, identification, barium or strontium, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Calcium Lactate. Gives chemical composition, identification, assay, and average dose.

819.84 Mercury Compounds

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Pills of Mild Mercurous Chloride (Compound Cathartic Pills). Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Mild Mercurous Chloride (Calomel Tablets). Gives chemical composition, identifications, mercuric chloride, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Tablets of Mild Mercurous Chloride and Sodium Bicarbonate (Calomel and Soda Tablets). Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Red Mercuric Iodide. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Yellow Mercurous Iodide. Gives chemical composition, identifications, assay, and average dose.

819.85 Potassium Compounds

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Potassium Chlorate. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Potassium Iodide. Gives chemical composition, identification, cyanide, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Potassium Permanganate. Gives chemical composition, identifications, assay, and average dose.

819.89 Miscellaneous Pills and Tablets

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Pills for Cascara (Hinkle's Pills). Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Pills of Colocynth and Jalap (Vegetable Cathartic Pills). Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Aloe. Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Aloe and Mastic (Lady Webster Dinner Pills). Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Aloe and Myrrh. Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Aloin, Strychnine, and Belladonna. Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Aloin, Strychnine, Belladonna, and Cascara. Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Aloin, Strychnine, Belladonna, and Ipecac. Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Asafetida. Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Ferrous Iodide. Gives chemical composition, preparation, test for purity, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Iron, Quinine, Strychnine, and Arsenic (Aitken's Pills). Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Rhubarb and Aloe. Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Acetanilid. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Acetophenetidin and Phenyl Salicylate (Phenacetin and Salol Tablets). Gives chemical composition, identifications, assay for acetophenetidin and for phenyl salicylate, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Aminopyrine. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary Seventh Edition, 1942. Tablets of Ammonium Chloride. Gives chemical composition, identification, reaction, thiocyanate, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Apomorphine Hydrochloride. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Arsenic Trioxide (Arsenous Acid Tablets). Gives chemical composition, identification, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Cinchophen. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Citrated Caffeine. Gives chemical composition, identifications, assay and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Cocaine Hydrochloride. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Ephedrine Hydrochloride. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Methenamine and Sodium Biphosphate (Tablets of Methenamine and Acid Sodium Phosphate). Gives chemical composition, identifications, aluminum and calcium, ammonium salts, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Morphine and Atropine Sulfates. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Phenolphthalein. Gives chemical composition, identification, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Phenyl Salicylate (Salol Tablets). Gives chemical composition, identifications, uncombined phenol or salicylic acid, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Scopolamine Hydrobromide (Hyoscine Hydrobromide Tablets). Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Strychnine Nitrate. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Three Bromides. Gives chemical composition, identification, chloride, assay for bromine and for ammonium bromide, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Troches of Elm. Gives chemical composition, preparation, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cascara Sagrada Tablets (Extract of Cascara Sagrada Tablets). Preparation, storage, and sizes.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1078; 1939. Lead Acetate, Compound Tablets.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1079A; 1941. Pills and Capsules, Special Formula.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1081A; 1940. Tablets, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1108; 1939. Arecoline Hydrobromide Hypodermic Tablets.

819.9 DRUGS AND MEDICINALS NOT ELSEWHERE CLASSIFIED

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Camphor Monobromid, Glonoin, Iodin, Picrotoxin, Resorcin, Salicin, and Santonine. Chemical symbol, synonyms, description, and preparations for triturations, tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Acriflavine (Acriflavine Base or Neutral Acriflavine). Gives chemical composition, description, solubility, identifications, loss on drying, ash, water-insoluble substances, arsenic, assay, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Acriflavine Hydrochloride. Gives chemical composition, description, solubility, stability of solutions, identifications, loss on drying, ash, arsenic, assay, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Methenamine (Ampuls of Hexamethylenamine). Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Anethol. Gives chemical composition, description, miscibility, specific gravity, congealing point, boiling point, optical rotation, index of refraction, reaction; aldehydes and ketones; phenols, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Camphorated Menthol (Camphor-Menthol). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Carbromal (Bromdiethylacetylurea). Gives chemical composition, description, solubility, melting point, identification, ash, carbonizable impurities, reaction, chloride and sulfate, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Carminative Mixture (Dalby's Carminative). Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cerium Oxalate. Gives chemical composition, description, solubility, identifications, minimum percent of oxides, carbonates; aluminum and zinc; arsenic, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Chlorothymol. Gives chemical composition, description, solubility, melting point, identifications, ash, reaction, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Coumarin. Gives chemical composition, description, solubility, melting point, identifications, distinction from vanillin, acetanilid, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ethylhydrocupreine Hydrochloride. Gives chemical composition, description, solubility, identifications, loss on drying, ash, carbonizable impurities, reaction, ammonium salts, quinine salts, assay, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Expectorant Mixture (Stoke's Expectorant). Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Guaiacol Carbonate. Gives chemical composition, description, solubility, melting point, identification, ash, carbonizable impurities, reaction, free guaiacol, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Iodine Petroxolin. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Iodoform (Triiodomethane). Gives chemical composition, description, solubility, melting point, loss on drying, ash; coloring matter, acids, and alkalies; assay and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Liquid Petroxolin. Gives chemical composition, description, specific gravity, miscibility, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Methyl Parahydroxybenzoate. Gives chemical composition, description, solubility, melting point, identification, ash, carbonizable impurities, reaction, chloride, sulfate, heavy metals, assay, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Monobromated Camphor. Gives chemical composition, description, solubility, melting point, identification, ash, soluble bromide, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phenothiazine (Thiodiphenylamine). Gives chemical composition, description, solubility, melting point, identifications, loss on drying, ash, ether-insoluble substances, assay, storage, and average dose (metric and apothecaries) for animals, swine, and chickens, based on the weight of the animal.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Resorcin Brown. Gives chemical composition, description, solubility, color, stability (fastness), standard, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Salicin. Gives chemical composition, description, solubility, melting point, optical rotation, identifications, loss on drying, ash, reaction, alkaloids, salicylic acid, heavy metals, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Santonin. Gives chemical composition, description, solubility, melting point, optical rotation, identifications, ash, reaction, alkaloids, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Scarlet Red (Scarlet Red, Medicinal or Biebirch, Scarlet Red). Gives chemical composition, description, solubility, identifications, ash, water-soluble substances, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solid Petroxolin. Gives chemical composition, storage, and preparation.

The 'American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sulfonethylmethane. Gives chemical composition, description, solubility, melting point, identifications, ash, reaction, readily oxidizable impurities, chloride, sulfate, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sulfonmethane. Gives chemical composition, description, solubility, melting point, identifications, loss on drying, ash, reaction, readily oxidizable substances, chloride, sulfate, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Toothache Drops, N. F. Gives chemical composition and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Washed Sulfur. Gives chemical composition, description, solubility, identification, ash, reaction, arsenic, assay, storage, preparation, and average dose.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Barbital and Phenobarbital. Method of testing for purity; tentative test for melting point according to U.S.P. method.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Drugs. Nitroglycerin. Methods for preparation of samples and reagents and for percentage of nitroglycerin.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Hexamethylenetetramine in Tablets. Tentative methods.

Preparation of sample and reagent, determination of purity.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Iodoform. Tentative method for determining percentage of iodoform.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Menthol. Tentative method for determining percentage of total menthol.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Pyramidon. Tests for identity and purity.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Barbital. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, benzene derivatives, and storage. U.S.P. product of barbital—Tabellae Barbitali.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Barbital Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Butacaine Sulfate. Description, solubility, melting point, identification, ash, carbonizable substances, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chiniofon Tablets. Identification, inorganic iodine, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chloral Hydrate, Description, solubility, identification, ash, carbonizable substances, reaction, chloride; chloral alcoholate, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chloroazodin. Description, solubility, identification, ash, chloride, assay; and storage. U.S.P. product of chloroazodin—Liquor Chloroazodini.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cyclopropane (Trimethylene). Description, solubility, acids and alkalies, carbon dioxide, halogens, propylene, allene and other unsaturated hydrocarbons, carbon monoxide, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dihydromorphinone Hydrochloride. Description, solubility, identification, loss on drying, ash, sulfate, ammonium salts, codeine, acidity, and storage. U.S.P. product of dihydromorphinone hydrochloride—Tabellae Dihydromorphinoni Hydrochloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dihydromorphinone Hydrochloride Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Estradiol Benzoate. Description, solubility, melting point, optical rotation, identification, completeness and reaction of solution, ash, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Elixir of Phenobarbital. Description, assay, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Erythrityl Tetranitrate Tablets (Erythrol Tetranitrate Tablets, Tetranitrol Tablets). Solubility, melting point, identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glyceryl Trinitrate Tablets (Nitroglycerin Tablets, Trinitrin Tablets). Assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Histamine Phosphate (Histamine Acid Phosphate). Description, solubility, melting point, identification, loss on drying, reaction, and storage. U.S.P. product of histamine phosphate—Injectio Histaminae Phosphatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Histamine Phosphate Injection (Histamine Acid Phosphate Injection). Description, identification, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Isotonic Solution of Three Chlorides (Ringer's Solution). Description, hydrogen ion concentration, heavy metals, arsenic, assay for calcium chloride, assay for potassium chloride, assay for total chlorides, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Menthol. Description, solubility, melting point, identification, wax, paraffin or inorganic substances, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Methenamine (Hexamethylenamine, Hexamethylenetetramine). Description, solubility, identification, loss on drying, ash, reaction, chloride, sulfate, ammonia salts, heavy metals, assay, and storage. U.S.P. product of methenamine—Tabellae Methenaminae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Neostigmine Bromide Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenobarbital (Phenylethylmalonylurea, Phenobarbitone). Description, solubility, melting point, identification, distinction from barbital, loss on drying, ash, carbonizable substances, reaction, phenylbarbituric acid, and storage. U.S.P. products of phenobarbital—Tabellae Phenobarbitali, Elixir Phenobarbitali.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenobarbital Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Chloroazodin. Description, specific gravity, identification, moisture, assay for chloroazodin, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Hydrogen Peroxide (Solution of Hydrogen Dioxide).

Description, specific gravity, identification, reaction, nonvolatile matter, acidity, arsenic, barium, heavy metals, limit of preservative, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tetracaine Hydrochloride. Description, solubility, melting point, identification; loss on drying, ash, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tetrachloroethylene, (Perchloroethylene, Ethylene Tetrachloride). Description, solubility, specific gravity, boiling point, nonvolatile residue, free acid, chloride ion, free chlorine, readily carbonizable substances, phosgene, and storage. U.S.P. product of tetrachloroethylene—Capsulae Tetrachloroaethyleni.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tetrachloroethylene Capsules. Identification, assay, storage, and sizes

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Trichloroethylene. Description, solubility, specific gravity, boiling point, distinction from chloroform and carbon tetrachloride, nonvolatile residue, free acids, chloride ion, free chlorine, acetylene, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Vanillin. Description, solubility, melting point, identification, loss on drying, ash, reaction, and storage.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1056; 1937. Naphthylamine (Alpha) Hydrochloride; Reagent Grade.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1057; 1937. Dimethylaminoazobenzene; Reagent Grade.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1059; 1937. Lacmoid; Reagent Grade.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1091; 1939. Orthotolidin; Recrystallized.

References.—Coat-tar products, as medicinals, *see* 803.2; Food and Drugs Act and Regulations, *see* 810; other chemicals in which some medicinal agents are included, *see* 820-839.

820-829 ACIDS (EXCEPT COAL-TAR) AND ANHYDRIDES, ALCOHOL, ETC.

820. GENERAL ITEMS

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Dry Cleaning Department, 1940. Includes formula for "Hexalin Pre-Spotter" and recommendations for use.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes general descriptions and recommended uses of the acids used in spotting department.

821. ACIDS AND ANHYDRIDES

821.0 GENERAL ITEMS

U. S. Gov., Dept. of Labor, Div. of Labor Standards. Special Bulletin 9; 1942. Safe Handling of Nitric Acid. Covers the safe use and handling of carboys including general care, filling carboys, care of cocks and valves, and moving carboys; personal equipment and safety clothing including goggles, rubber gloves, rubber boots, rubber aprons, rubber coats, woolen clothing, and gas masks; and safety showers.

821.1 ACETIC ACID

American Chemical Society. Specifications for Analytical Reagents, 1941. Acetic Anhydride. Gives requirements for assay, nonvolatile matter, chloride, sulfate, phosphate, substances reducing permanganate, heavy metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Acetic, Glacial. Gives requirements for assay, dilution test, nonvolatile matter, chloride, sulfate, substances reducing permanganate, heavy metals, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Acetic Acid. Chemical symbol, synonyms, description, and preparations for solution, dilutions, and triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Diluted Acetic Acid. Gives chemical composition, description, miscibility, specific gravity, identification, reaction, other tests, assay, storage, and average dose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Acetic Acid. Covers definition, characteristics, solubility, acidity, derivation, uses, grades, containers, shipping, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Acetic Acid. Description, solubility, specific gravity, reaction, identification, nonvolatile residue, chloride, sulfate, heavy metals, readily oxidizable substances, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glacial Acetic Acid. Description, solubility, congealing point, boiling point, identification, nonvolatile residue, chloride, sulfate, heavy metals, readily oxidizable substances, assay, and storage.

U. S. Gov., Federal Specification O-A-76; 1935. Acid; Acetic (Technical). Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Acidimetric standards (benzoic acid), *see* 802.1; unit weights, *see* 820; Food and Drugs Act and Regulations, *see* 810; acetic acid as a laundry sour, *see* 871.25; vinegar, *see* 154.70, 154.71.

821.2 BORIC ACID

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid Boric. Gives requirements for insoluble in alcohol, nonvolatile with methanol, chloride, phosphate, sulfate, arsenic, calcium, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Boric Acid. Chemical symbol, synonyms, description, and preparation for trituration for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Boric Acid. Gives chemical composition, preparation, description, identification, reaction, arsenic, heavy metals, assay, storage, and dilution for ophthalmic use.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Boric Acid. Qualitative and quantitative test methods.

Toilet Goods Assn., Inc. Specification No. 5; 1941. Boric Acid. Gives requirements for color, odor, identity, H_3BO_3, solutility, water insoluble substances, alcohol insoluble substances, arsenic, lead, and other heavy metals.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Boric Acid (Boracic Acid). Description, solubility, identification, alcohol-insoluble substances, water-insoluble substances, reaction, arsenic, heavy metals, assay and storage. U.S.P. products of boric acid—Glyceritum Boroglycerini, Unguentum Acidi Borici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Boric Acid Ointment (Boracic Acid Ointment). Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerite of Boroglycerin. Preparation, reaction, assay, and storage.

U. S. Gov., Treasury Dept., Procurement Div., No. 645; 1944. Acid; Boric, Technical Grade. Covers one type and one grade in granular form intended for use in photographic processes. Gives boric acid content and solubility test; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Acidimetric standards (benzoic acid), *see* 802.1; unit weights, *see* 820; Food and Drugs Act and Regulations, *see* 810.

821.3 HYDROCHLORIC (MURIATIC) ACID

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Hydrochloric. Gives requirements for appearance, strength, nonvolatile matter, sulfate, free chlorine, sulfite, arsenic, iron, heavy metals, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Hydrochloric Acid. Chemical symbol, synonyms, description, and preparations for solution and dilutions for use in homoeopathic medicines.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet T-3. Table—Hydrochloric Acid. Standard. Adopted, 1903. Embodies specific gravity, percentage, Baumé and Tw.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Hydrochloric Acid (Muriatic Acid). Covers definition, derivation, constants, solubility, impurities, uses, grades, containers, hazards, shipping regulations, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diluted Hydriodic Acid. Description, specific gravity, identification, residue on ignition, reaction, chloride, free iodine, sulphate, arsenic, barium, heavy metals, limit of hypophosphorous acid, assay for hydriodic acid, and storage. U.S.P. product of diluted hydriodic acid—Syrupus Acidi Hydriodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diluted Hydrochloric Acid. Description, specific gravity, reaction, other tests, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Hydrochloric Acid. Description, specific gravity, identification, residue on ignition, reaction, bromide or iodide, free bromine or chlorine, sulfate, sulfite, arsenic, heavy metals, assay, and storage. U. S. P. product of hydrochloric acid—Acidum Hydrochloricum Dilutum.

U. S. Gov., Federal Specification O-A-86; 1943. Acid; Hydrochloric (Muriatic), Technical Grade. Shall be of one grade. Gives requirements for specific gravity, total acid content, residual acid, sampling, tests, packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept., Specification 4-1064; 1937. Acid; Hydrochloric, Technical.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-17; 1925. Acid; Hydrochloric.

References.—Acidimetric standards (benzoic acid), *see* 802.1; unit weights, labeling requirements, *see* 820, 821.0; Food and Drugs Act and Regulations, *see* 810.

821.4 HYDROFLUORIC ACID

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Hydrofluoric. Gives requirements for assay, fluosilicic acid, nonvolatile matter, chloride, sulfate, sulfite, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Hydrofluoric Acid. Chemical symbol, synonyms, and descriptions for solutions and dilutions for use in homoeopathic medicines.

Manufacturing Chemists Assn. Manual Sheet H-2. Unloading Anhydrous Hydrofluoric Acid From Cylinders. Recommended Practice, 1944. Includes description of product, general precautions (first aid and general treatment), cylinder types, cylinder handling precautions, consumers' equipment, emptying the cylinder, operating cylinder valves, and introduction of anhydrous hydrofluoric acid into process.

U. S. Gov., Navy Dept. Specification 51A12; 1944. Acid; Hydrofluoric, Technical.

U. S. Gov., Treasury Dept., Procurement Div., No. 643; 1943. Acid; Hydrofluoric, Technical Grade. Covers one type, one grade, and two classes—(A) 30 percent acid, and (B) 52 percent acid. Gives requirements for each class including hydrofluoric acid content, hydrofluosilicic acid content, and sulfuric acid content; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Acidimetric standards (benzoic acid), *see* 802.1; unit weights, labeling requirements, *see* 820, 821.0; Food and Drugs Act and Regulations, *see* 810.

821.5 NITRIC ACID

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid Nitric. Gives requirements for appearance, strength, nonvolatile matter, sulfate, chloride, arsenic, heavy metals, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Nitric Acid. Chemical symbol, synonyms, description, and preparations for solution and dilutions for use in homoeopathic medicines.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet T-5. Table—Nitric Acid. Standard. Adopted, 1903. Embodies specific gravity, percentage, Baumé and Tw.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Nitric Acid (Aqua Fortis). Covers definition, derivation, constants, solubility, uses, grades, containers, shipping regulations, hazards, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nitric Acid. Description, specific gravity, identification, residue on ignition, reaction, arsenic, chloride, sulfate, heavy metals, assay, and storage.

U. S. Gov., Federal Specification O-A-88; 1943. Acid; Nitric, Technical Grade. Shall be in one type and in one grade. Gives requirements for appearance, total acid content, specific gravity, residual acid, chloride, sampling, tests, packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-3B; 1941. Acid; Nitric, for use in Manufacturing Explosives.

References.—Acidimetric standards (benzoic acid), *see* 802.1; unit weights, labeling requirements, *see* 820, 821.0; Food and Drugs Act and Regulations, *see* 810.

821.6 OXALIC ACID

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid Oxalic. Gives requirements for insoluble matter, nonvolatile matter, chloride, sulfate, nitrogen compounds, heavy metals, substances darkened by hot sulfuric acid, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Oxalic Acid. Chemical symbol, synonyms, description, and preparations for triturations, tincture, dilutions, and medications for use in homoeopathic medicines.

American Leather Chemists Assn. Method of Sampling and Analysis. Oxalic Acid, 1942. Gives requirements for oxalates, insoluble matter, ash, neutral oxalates, iron, aluminum, calcium, magnesium, sulfate, and chloride.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Oxalic Acid. Covers definition, constants, solubility, derivation, uses, grades, containers, hazards, and substitutes.

U. S. Gov., Federal Specification O-A-91; 1935. Acid; Oxalic, Technical. Covers three types in one grade—(I) large-crystal, (II) small-crystal, and (III) powdered. Gives detail requirements for each type; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Oxalic acid as laundry sour, *see* 871.25; acidimetric standards (benzoic acid), *see* 802.1; unit weights, *see* 820; Food and Drugs Act and Regulations, *see* 810.

821.7 SULPHURIC AND SULPHUROUS ACID

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Sulfuric. Gives requirements for appearance, strength, nonvolatile matter, chloride, nitrate, ammonium, substances oxidizable by permanganate, arsenic, heavy metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Sulfurous. Gives requirements for assay, nonvolatile matter, chloride, arsenic, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sulphuric Acid. Chemical symbol, synonyms, description, and preparations for solution and dilutions for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sulfuric Acid, 1942. Gives requirements for total acid as H_2SO_4.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Sulfurous Acid. Qualitative test; determination of total sulfurous acid and of free sulphurous acid.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet T-7. Table—Sulphuric Acid. Standard. Adopted, 1904. Embraces specific gravity, percentages, Baumé and Tw.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet T-7A. Table—Sulphuric Acid, 94-100 Percent. Standard. Adopted, 1938. Embraces specific gravity, percentages, Baumé and Tw.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet TC-8. Oleum Freezing Point Diagram. Covers the freezing point of purified oleum in the range 0-85 percent free SO_3. Freezing points are plotted in the form of an equilibrium diagram calibrated for both centigrade and Fahrenheit temperature scales, composition being expressed in terms of free SO_3, total SO_3, and H_2SO_4.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Acid; Sulphuric. Covers definition, constants, solubility, derivation, impurities, grades, substitutes, containers, shipping regulations, and uses.

Technical Assn. of the Pulp and Paper Industry, Analysis of Sulphuric Acid. Standard T 602 m-35; 1935. Concentrated 93 percent pure, using specific gravity hydrometer, Imhoff cone test for sediment, and test for the presence of iron. Also includes volumetric test method.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diluted Sulfuric Acid. Description, specific gravity, reaction, other tests, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfuric Acid. Description, miscibility, specific gravity, identification, nonvolatile substances, reaction, chloride, nitrate, nitrite or sulfite, arsenic, heavy metals, assay, and storage. U.S.P. product of sulfuric acid—Acidum Sulfuricum Dilutum.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C19; 1924. Standard Density and Volumetric Tables. Includes tables of density of solutions of sulphuric acid.

U. S. Gov., Federal Specification O-A-111; 1935. Acid; Sulphuric, (for) Storage Batteries. Covers two classes—(A) concentrated sulphuric acid and (B) diluted sulphuric acid. Gives general requirements for specific gravity of each class; detail requirements for strengths, colors, and limits of impurities; methods of sampling, inspection, and test; and requirements for packing and marking (safety requirements to conform to requirements of Interstate Commerce Commission).

U. S. Gov., Navy Dept. Specification 51A2f; 1943. Acid; Sulphuric, for Storage-Battery Electrolyte.

U. S. Gov., Navy Dept. Specification 51A6b; 1940. Acid; Sulfuric, Pickling.

U. S. Gov., Navy Dept. Specification 51C29a; 1943. Chemicals; Testing, Dissolved-Oxygen.

U. S. Gov., Treasury Dept., Procurement Div., No. 609; 1943. Acid; Sulfuric, Technical Grade. Shall be furnished in types I and II; and Grade A, general use and Grade B, galvanizing and plating. Gives requirements for specific gravity, total acid content, insoluble matter, and arsenic; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1068A; 1939. Acid; Sulfuric, Fuming, Reagent Grade.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-1A; 1938. Acid; Sulfuric, and Oleum.

References.—Acidimetric standards (benzoic acid), *see* 802.1; unit weights, labeling requirements, *see* 820, 821.0; Food and Drugs Act and Regulations, *see* 810.

821.9 MISCELLANEOUS ACIDS AND ANHYDRIDES

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Citric. Gives requirements for insoluble matter, residue on ignition, oxalate, phosphate, sulfate, tartrate, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Formic. Gives requirements for assay, dilution test, nonvolatile matter, acetic acid, chloride, sulfate, sulfite, heavy metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Hydriodic. Gives requirements for assay, nonvolatile matter, chloride and bromide, phosphorus, sulfate, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Molybdic Anhydride. Gives requirements for assay, insoluble in ammonium hydroxide, chloride, nitrate, phosphate, sulfate, heavy metals, ammonia, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Molybdic, 85 Percent. Gives requirements for assay, insoluble in ammonium hydroxide, chloride, phosphate, sulfate, heavy metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Perchloric, 60 Percent. Gives requirements for assay, nonvolatile matter, chloride, nitrogen compounds, sulfate, ammonia, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Phosphoric. Gives requirements for assay, chloride, nitrate, reducing substances, sulfate, volatile acids, alkali and other phosphates, arsenic, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Sulfanilic. Gives requirements for residue on ignition, insoluble in sodium carbonate solution, chloride, nitrite, sulfate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Acid; Tartaric. Gives requirements for insoluble matter, residue on ignition, oxalate, phosphate, sulfate, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Chromic Acid, Citric Acid, Formic Acid, Gallic Acid, Hydrocyanic Acid, Lactic Acid, Nitro-Hydrochloric Acid, Normal Butyric Acid, Phosphoric Acid, Tannic Acid, and Tartanic Acid. Chemical symbol, synonyms, description, and preparations for triturations, tincture, dilutions, and medications for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Lactic Acid, 1942. Gives requirements for free sulfuric acid, volatile acid, free acid and anhydride, and distillation table.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cinchophen (Phenylcinchoninic Acid or Phenyl-Quinoline-Carboxylic Acid). Gives chemical composition, description, solubility, melting point, identifications, ash, loss on drying, readily carbonizable substances, aniline derivatives, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Diluted Hydrocyanic Acid (Diluted Prussic Acid). Gives chemical composition, description, identification, residue, reaction, limit for hydrochloric acid, assay for hydrocyanic acid, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Diluted Nitrohydrochloric Acid (Diluted Nitromuriatic Acid). Gives chemical composition, description, residue, reaction, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Formic Acid. Gives chemical composition, description, miscibility, specific gravity, identifications, residue, reaction, chloride, oxalate, sulfate, sulfurous acid, heavy metals, acetic acid, acrolein and allyl formate, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Gallic Acid. Gives chemical composition, description, solubility, identifications, loss on drying, ash, reaction, tannic acid, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Nitrohydrochloric Acid (Nitromuriatic Acid or Aqua Regia). Gives chemical composition, description, identification, residue, reaction, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pectin. Gives chemical composition, description, solubility, identifications, starch, sugars and organic acids, methanol, arsenic, lead, assay for methoxyl groups and for galacturonic acid, storage, and preparations.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Formic Acid. Preparation of reagents, description of apparatus, and method for quantitative determination of formic acid in sample.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes formulae for general spotting agent, carbon disulfide mixtures, and commercial rust removers—methods of preparation and recommended uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Formic Acid. Covers definition, constants, solubility, derivation, grades, uses, packaging and shipping, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Stearic Acid. Covers definition, constants, solubility, derivation, grades and forms, packing, uses, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Carbarsone. Description, solubility, melting point, identification, loss on drying, reaction, arsenate, assay and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Citric Acid. Description, solubility, identification, difference from tartaric acid, ash, carbonizable substances, reaction, oxalic acid, sulphate, heavy metals, assay, and storage. U.S.P. product of citric acid—Syrupus Acidi Citrici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diluted Phosphoric Acid. Description, specific gravity, other tests, reaction, alkali phosphates, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerite of Tannic Acid. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Hexylresorcinol Description, solubility, melting point, identification, ash, acid, resorcinol and other phenols, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Hypophosphorous Acid. Description, specific gravity, identification, reaction, arsenic, barium, oxalate, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Lactic Acid. Description, solubility, specific gravity, identification, ash, readily carbonizable substances, reaction, chloride (citric, oxalic, phosphoric, or tartaric acid), sulfate, heavy metals, sugars, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mandelic Acid (Racemic Mandelic Acid). Description, solubility, melting point, identification, loss on drying, ash, reaction, chloride, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oleic Acid. Description, solubility, specific gravity, congealing temperature, ash, mineral acids, iodine value, acid value, neutral fat or mineral oil, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phosphoric Acid. Description, solubility, specific gravity, identification, reaction, nitrate, phosphorous or hypophosphorous acid, sulfate, arsenic, alkali phosphates, heavy metals, assay, and storage. U.S.P. product of phosphoric acid—Acidum Phosphoricum Dilutum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Resorcinol (Resorcin). Description, solubility, melting point, identification, loss on drying, ash, reaction, phenol, catechol, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Arsenious Acid (Hydrochloric Solution of Arsenic, Solution of Arsenic Chloride). Description, identification, reaction, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Stearic Acid. Description, solubility, congealing temperature, mineral acid, iodine value, neutral fat or paraffin, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tannic Acid (Gallotannic Acid, Tannin). Description, solubility, identification, loss on drying, ash, gum or dextrin, resinous substances, and storage. U.S.P. product of tannic acid—Glyceritum Acidi Tannici, Unguentum Acidi Tannici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tannic Acid Ointment. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tartaric Acid. Description, solubility, identification, difference in citric acid, ash, reaction, oxalate, sulfate, loss on drying, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Trichloroacetic

Acid. Description, solubility, identification, ash, reaction, chloride, sulfate, assay, and storage.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-21; 1944. Acid; Chromic.

U. S. Gov., Dept of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Anisic Acid, Sample 142; and Cystine, Sample 143. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Navy Dept. Specification 51A18; 1944. Acid; Phosphoric, Technical.

U. S. Gov., Navy Dept. Specification 52L11a; 1941. Linoleate; Maganese.

U. S. Gov., Treasury Dept., Procurement Div., No.564; 1942. Acid; Butyric, Technical. Covers one type and grade intended for use as a base in the manufacture of esters to be used as artificial flavoring ingredients. Gives requirements for appearance, color, odor, specific gravity, distillation, range, nonvolatile matter, purity, chlorides, sulfates, heavy metals, and water; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.639; 1943. Citric Acid; Technical Grade. Covers one type and grade of colorless, crystalline monohydrate of citric acid. Gives requirements for citric acid content, oxalates, ash content, and particle size; methods of sampling, inspection, and tests; and packaging, packing and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.663; 1944. Acid; Phosphoric, Technical Grade. Covers one grade, two types—(I) 75 percent acid and (II) 85 percent acid. For use in lithographic work and in the chemical treatment of ferrous metal surfaces. Gives requirements for specific gravity, total acidity, sulfate, arsenic, alkali and other phosphates, and heavy metals; methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept. Procurement Div., No.668; 1944. Glycin (p-hydroxyphenylamino-acetic-acid), (for Photographic Purposes). Covers one type and one grade in the form of finely divided material. Gives requirements for appearance, crystallizing point, ash content, solubility in ammonia, and solubility in hydrochloric acid; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-15; 1924. Acid; Monochloracetic.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-21-20; 1940. Phosphoric Acid, Technical Grade.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1055; 1937. Acid; Sulfosalicylic, Reagent Grade,

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1065; 1937. Acid; Phosphotungstic, Crystal, Reagent Grade.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-7A; 1938. Acid; Mixed, for Use in Nitrating.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-47A; 1942. Acid; Stearic, for Use in Ammunition Loading.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-16; 1923. Acid; Chromic, C.P.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-18; 1923. Acid; Phosphoric.

References.—Coal-tar acids, *see* 802.1; acidimetric standards (benzoic acid), *see* 802.1; unit weights, labeling requirements, *see* 820, 821.0; Food and Drugs Act and Regulations, *see* 810.

822. Alcohols

822.0 GENERAL ITEMS

American Standards Assn., Z37.14-1944. Allowable Concentration of Methanol. The purpose of this standard is to prescribe the maximum permissible concentration of methanol in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Covers properties of methanol, permissible concentration, and sampling procedure and analytical methods.

822.1 AMYL ALCOHOL

American Chemical Society. Specifications for Analytical Reagents, 1941. Amyl Alcohol (Isoamyl Alcohol). Gives requirements for nonvolatile matter, boiling range, acids and esters, aldehydes, substances darkened by sulfuric acid, and tests.

American Society for Testing Materials, D 319-40; 1940. Amyl Alcohol (Synthetic). Specifications cover water white alcohol for lacquer solvent, specific gravity, distillation range, nonvolatile matter, odor, water, acidity, and tests by A.S.T.M. Method D 268.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Amylene Hydrate (Tertiary Amyl Alcohol). Description, solubility, specific gravity, boiling point, identification, nonvolatile residue, reaction, heavy metals, aldehyde, readily oxidizable substances, water, and storage.

U. S. Gov., U. S. Army, Army Air Forces. Specification 4-1047-A; 1941. Amyl Alcohol; Secondary.

References.—Methods of testing, *see* 822.0; definitions, regulations on making and using alcohol, *see* 822.0.

822.2 BUTYL ALCOHOL

American Society for Testing Materials, D 304-40; 1940. Butanol (Normal Butyl Alcohol). For lacquer solvent or diluent. Specifications cover gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and test by A.S.T.M. Method D 268.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Alcohol; Butyl. Covers definition, derivation, constants, solubility, uses, containers, shipping regulations, and substitutes.

U. S. Gov., Army Air Forces. Specification 14083; 1935. Secondary Butyl Alcohol (Refined 98 Percent Grade).

U. S. Gov., Army-Navy Aeronautical Specification AN-O-A-391; 1941. Alcohol; Butyl, Normal.

References.—Methods of testing, *see* 822.0; definitions, regulations on making and using alcohol, *see* 822.0.

822.3 ETHYL ALCOHOL, DENATURED

U. S. Gov., Army-Navy Aeronautical Specification AN-A-18; 1943. Alcohol; Specially Denatured Ethyl.

U. S. Gov., Navy Dept. Specification 51A13a; 1944. Alcohol; Ethyl.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-1018A; 1939. Alcohol; Ethyl.

References.—Ethyl alcohol, wood alcohol, *see* 822.4, 822.5; methods of testing, *see* 822.0; definitions, regulations on making and using alcohol, *see* 822.0.

822.4 ETHYL ALCOHOL, PURE GRAIN

American Chemical Society. Specifications for Analytical Reagents, 1941. Alcohol; Ethyl. Gives requirements for assay, solubility in water, residue on evaporation, acetone isopropyl alcohol, acidity, alkalinity, fusel oil, methanol, substances darkened by sulfuric acid, substances reducing permanganate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Alcohol; Ethyl, Absolute. Gives requirements for assay, solubility in water, residue on evaporation, acetone isopropyl alcohol, acidity, alkalinity, fusel oil, methanol, substances darkened by sulfuric acid, substances reducing permanganate, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Alcohol or Alcohol Fortior (Strong Alcohol) and Official Alcohol or Dispensing Alcohol (Alcohol Officinale). Definition, analysis, and purity and identity requirements for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Alcohol (Ethanol, Ethyl Alcohol). Description, miscibility, specific gravity, boiling point, free acid, total solids, fusel oil constituents, amyl alcohol or nonvolatile, carbonizable impurities, aldehydes, organic impurities, acetone, other ketones, isopropyl alcohol, and tertiary butyl alcohol, alkaloids and formaldehyde, methanol, and storage. U.S.P. products of alcohol—Alcohol Dehydratum, Alcohol Dilutum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dehydrated Alcohol (Dehydrated Ethanol, "Absolute Alcohol"). Description, specific gravity, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1943. Diluted Alcohol (Diluted Ethanol). Description, specific gravity, other tests, and storage.

U. S. Gov., Dept of Commerce, National Bureau of Standards. Circular C19; 1924. Standard Density and Volumetric Tables. Includes tables of density of mixtures of ethyl alcohol and water, specific gravity of such mixtures, and percentages of volume corresponding to various percentages of weight.

U. S. Gov., Navy Dept. Specification 51A13a; 1944. Alcohol; Ethyl.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-1018A; 1939. Alcohol; Ethyl.

References.—Denatured alcohol, *see* 822.3; methods of testing, *see* 822.0; definitions, regulations on making and using alcohol, *see* 822.0; Food and Drugs Act and Regulations, *see* 810.

822.5 METHYL OR WOOD ALCOHOL (METHANOL)

U. S. Gov., Army-Navy Aeronautical Specification AN-M-32-1; 1945. Methanol; Synthetic.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C19; 1924. Standard Density and Volumetric Tables. Includes tables of density and of specific gravity of mixtures of methyl alcohol and water and percentages by volume corresponding to various percentages by weight.

U. S. Gov., Treasury Dept., Procurement Div., No.586; 1942. Methanol; Technical Grade. Covers one grade of either synthetic or a product of wood distillation intended for use as a solvent. Gives requirements for specific gravity, appearance, color, odor, spot test, neutrality, nonvolatile at 105° to 110° C., and distillation range; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Denatured alcohol, *see* 822.3; methods of testing, *see* 822.0; definitions, regulations on making and using alcohol, *see* 822.0.

822.9 MISCELLANEOUS ALCOHOLS

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Guaiacol. Gives chemical composition, description, solubility, specific gravity, melting point, distilling range, identification, impurities, ash, hydrocarbons, storage, and average dose.

American Society for Testing Materials, D 770-44 T; 1944. Tentative Specifications for Isopropyl Alcohol. Covers isopropyl alcohol, 99 percent grade. Gives properties and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Alcohol; Furfuryl (Furyl Carbinol). Covers definition, constants, solubility, derivation, uses, grades, containers, hazards, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Alcohol; Isopropyl (Dimethyl Carbinol; Isopropanol). Covers definition, constants, solubility, derivation, uses, grades, containers, shipping regulations, hazards, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Tribromoethanol (Solution of Tribromoethyl Alcohol). Description, free acid, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Terpin Hydrate. Description, solubility, melting point, identification, ash, reaction, residual turpentine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tribromoethanol (Tribromoethyl Alcohol). Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, halogen ions, sulfate, aldehyde, assay, and storage. U.S.P. product of tribromoethanol—Liquor Tribromoaethanolis.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-7; 1943. Alcohol; Diacetone.

U. S. Gov., Army-Navy Aeronautical Specification AN-E-2b; 1944. Ethylene Glycol; Non-Corrosive (Anti-Freeze and Cooling Liquid for Aircraft Engines).

U. S. Gov., Army-Navy Aeronautical Specification AN-F-13; 1943. Fluid; Anti-Icing (Isopropyl Alcohol).

U. S. Gov., Treasury Dept., Procurement Div., No.565; 1942. Diacetone Alcohol (Commercially Pure). Covers one type and grade intended for use as an ingredient in fluid for hydraulic brakes, shock struts and automatic pilots, and in the manufacture of organic protective coatings. Gives requirements for appearance, color, odor, specific gravity, distillation range, nonvolatile matter, water test (dryness), water solubility, acidity, and index of refraction; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1088; 1939. Mannite.

References.—Food and Drugs Act and Regulations, *see* 810.

823. GLYCERINE

American Chemical Society. Specifications for Analytical Reagents, 1941. Glycerol. Gives requirements for color, specific gravity, nonvolatile matter, neutrality, chloride, sulfate, fatty acid esters, silver-reducing substances, substances darkened by sulfuric acid, heavy metals, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Glycerin. Description, properties, specific gravity, and tests for identifying material for use in homoeopathic medicine.

American Oil Chemists' Society. Standard Methods for Sampling and Analysis of Glycerine, 1938. Covers methods of crude glycerine analysis, acetin process for the determination of glycerol, instructions for calculating the glycerol content, bichromate process for glycerol determination, and appendix.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Glycerin. Covers definition, constants, solubility, conversion factors, derivation, uses, grades, marketing, containers, and substitutes.

Toilet Goods Assn., Inc. Specification No.3; 1940. Glycerine. Gives requirements for color, odor, solubility, identify, specific gravity, free acids and alkalis, carbonaceous and mineral residue, mineral residue, carbonizable substances, fatty acids and esters, sulfates, oxalates, chlorides, heavy metals, acrolein, glucose and ammonium compounds, grit, and packaging.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerin (Glycerol). Description, solubility, specific gravity, identification, nonvolatile residue and ash, carbonizable substances, reaction, chloride, sulfate, arsenic, heavy metals, acrolein, glucose, ammonium compounds, fatty acids and esters, color, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerinated Gelatin. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerite of Boroglycerin. Preparation, reaction, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerite of Starch. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Glycerite of Tannic Acid. Preparation and storage.

U. S. Gov., Federal Specification O-G-491; 1931. Glycerin (Glycerol). Covers three grades—(A) U.S.P., (B) "high-gravity" ("dynamite glycerin"), and (C) "yellow distilled." Gives requirements for appearance, color, odor, specific gravity, acidity or alkalinity, ash, and chlorides (calculated as chlorine); methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 51G1e; 1941. Glycerin (Glycerol).

References.—Food and Drugs Act and Regulations, *see* 810.

824. ALDEHYDES

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Benzaldehyde. Gives chemical composition, description, miscibility, specific gravity, hydrocyanic acid, chlorinated compounds, nitrobenzene, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Camphorated Chloral. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Benzaldehyde. Gives chemical composition, storage, alcohol content, and preparation.

American Standards Assn., Z37.16-1944. Allowable Concentration of Formaldehyde. The purpose of this standard is to prescribe the permissible concentration of formaldehyde in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Covers properties of formaldehyde, permissible concentration, and sampling procedure and analytical methods.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Formaldehyde Solutions. Official methods for determination of formaldehyde.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservative and Artificial Sweeteners. Formaldehyde. Preparation of sample; test methods for indicating presence of formaldehyde.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Furfural (Furfuraldehyde). Covers definition, constants, solubility, derivation, grades, containers, uses, hazards and substitutes.

Technical Assn. of the Pulp and Paper Industry. Analysis of Formaldehyde. Standard T 600 m-36; 1936. To determine the formaldehyde content of aqueous solutions, for use as glue preservative, and to render glue and casein insoluble. Requirements for testing and reagents necessary. This is the official method of the Assn. of Official Agricultural Chemists.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Paraldehyde (Paracetaldehyde). Description, solubility, specific gravity, distillation range, congealing temperature, identification, free acid, chloride, sulfate, amyl alcohol, residue on evaporation, acetaldehyde, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Formaldehyde. Description, solubility, identification, free acid, assay, and storage.

U.S. Gov., Treasury Dept., Procurement Div., No. 631; 1943. Paraformaldehyde; Technical Grade. Shall be in one type and one grade in powdered form free from hard lumps and foreign particles. Intended for use in photographic processes. Gives requirements for paraformaldehyde content, ash, acidity, solubility, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.— Preservatives and artificial sweeteners, *see* 892; insecticides, *see* 881; Food and Drugs Act and Regulations, *see* 810.

830-839 CHEMICAL COMPOUNDS

(Except Medicinals, Acids, Alcohols, and Coal-Tar Products)

830. GENERAL ITEMS

American Assn. of Textile Chemists and Colorists. 1943 Yearbook. Textile Chemical Specialties. Gives an index to standard chemicals used in the textile industry, tabulated alphabetically, trade names, principal uses, chemical nature, complete qualitative composition if a mixture, method of manufacture (briefly), and manufacturers.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes general description and recommended uses of chemical compounds used in spotting department.

Technical Assn. of the Pulp and Paper Industry. Indicators for Volumetric Analyses. Standard T 609 m-42; 1942. The indicators ordinarily used for volumetric analyses shall be made up as described below, unless otherwise specified. Covers methyl orange, methyl red, phenolphthalein, starch, potassium and sodium chromate, and ferric nitrate.

Technical Assn. of the Pulp and Paper Industry. Preparation and Standardization of Volumetric Solutions. Standard T 610 m-42; 1942. Details method of preparing various solutions used in paper manufacturing laboratory, with correction factor for temperature of preparation, with permissible variations.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C19; 1924. Standard Density and Volumetric Tables. Includes tables of density and weight of water at various temperatures.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C279; 1925. Relations Between the Temperatures, Pressures, and Densities of Gases. The purpose of this circular is to show in a simple manner the methods by which the relations between the temperatures, pressures, and densities of gases may be computed and to present the necessary experimental data in such a way that they can be directly and easily used for solving practical problems.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M126; 1937. Temperature Interconversion Tables (°C—°F) and Melting Points of the Chemical Elements. Table of melting points of elements and boiling points of some liquids with the values indicated which are used by the Bureau as standard temperatures for calibration of thermometers and pyrometers.

U. S. Gov., Treasury Dept., Procurement Div., No. 674; 1944. Chemical; General Specifications (Methods for Testing). This general specification covers specified methods for testing chemicals. Test methods include volatile matter, loss on heating, residue on ignition, precipitate (calcium, magnesium, and ammonium hydroxide), heavy metals, iron, bromides and iodides, carbonates and bicarbonates, sulfates, oxalates, water insoluble matter, solubility, and neutrality.

831. AMMONIUM AND AMMONIUM COMPOUNDS

831.1 ANHYDROUS AND AQUA AMMONIA

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Hydroxide. Gives requirements for appearance, strength, nonvolatile matter, carbon dioxide, total sulfur, chloride, pyridine, substances reducing permanganate, heavy metals, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ammonium Hydrate. Chemical symbol, synonyms, description, and preparations for solution and dilutions for use in homoeopathic medicines.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet T-1. Table—Aqua Ammonia. Standard. Adopted, 1903. Embodies specific gravity, percentage, Baumé and Tw.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Ammonia. Covers definition, grades, containers, uses, shipping regulations, and source.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aromatic Spirit of Ammonia. Description, specific gravity, assay for total ammonia, assay for normal ammonium carbonate, alcohol content, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diluted Solution of Ammonia (Solution of Ammonium Hydroxide). Description, specific gravity, identification, reaction, nonvolatile substances, heavy metals, oxidizable substances, assay, and storage. U.S.P. product of diluted solution of ammonia—Spiritus Ammoniae Aromaticus.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strong Solution of Ammonia (Stronger Ammonia Water). Description, specific gravity, reaction, other tests, assay, and storage. U.S.P. product of strong solution of ammonia—Liquor Ammoniae Dilutus.

U. S. Gov., Federal Specification O-A-445; 1943. Ammonia; Anhydrous (Compressed). Shall be furnished in one grade suitable for refrigeration and nitriding purposes. Gives requirements for ammonia, residue, capacity of cylinders, type of cylinders, and finishes and markings of cylinders; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification O-A-451; 1935. Ammonia; Aqua (Ammonium-Hydroxide), Technical. Covers one type of two compositions—class A, diluted and class B, concentrated. Gives detail requirements for specific gravity and strength; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-143; 1940. Ammonia; Anhydrous.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1076A; 1940. Ammonia; Aromatic.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-18; 1928. Ammonium Hydroxide, Aqua Ammonia.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

831.2 BICHROMATE, AMMONIUM

U. S. Gov., Treasury Dept., Procurement Div., No. 628; 1943. Ammonium Dichromate; Technical Grade. Covers one type and one grade, in granular form, and not caked in containers. Intended for use in lithographic processes. Gives requirements for chemical composition, water-insoluble matter, and particle size; methods of sampling, inspection, and tests; and packaging and marking.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-20; 1923. Ammonium Bichromate.

831.3 CARBONATE AND BICARBONATE, AMMONIUM

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Carbonate. Gives requirements for assay, insoluble matter, nonvolatile matter, chloride, sulfur compounds, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ammonium Carbonate. Chemical symbol, synonyms, description, and preparations for solutions and dilutions for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ammonium Carbonate. Description, solubility, identification, residue on ignition, reaction, chloride, sulfate, heavy metals, empyreumatic matter, assay, and storage. U.S.P. product of ammonium carbonate—Spiritus Ammoniae Aromaticus.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-16A; 1936. Ammonium Carbonate; Lump Form (for Use in Metal-Fouling Solutions).

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

831.4 CHLORIDE, AMMONIUM

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Chloride. Gives requirements for insoluble matter, nonvolatile matter, free acid, phosphate, sulfate, calcium and magnesium precipitate, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ammonium Chloride. Chemical symbol, synonyms, description, and preparations for solution, dilutions, medications, and triturations for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Ammonium Chloride, 1942. Gives requirements for water, insoluble matter, ammonium salts, nonvolatile matter, and analysis of nonvolatile matter.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Ammonium Chloride. Gives chemical composition, identification, reaction, thiocyanate, assay, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ammonium Chloride (Muriate of Ammonia). Description, solubility, identification, loss on drying, residue on ignition, free acid, thiocyanate, heavy metals, assay, and storage. U.S.P. product of ammonium chloride—Capsulae Ammonii Chloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ammonium Chloride Capsules. Identification, assay, and sizes.

U. S. Gov., Federal Specification O-A-491; 1930. Ammonium-Chloride (Sal Ammoniac). Covers two grades—(A) for battery purposes (B) for galvanizing purposes. Grade A ammonium chloride is a white crystalline or granular powder, without odor. Grade B ammonium chloride is what is known as "gas house" sal ammoniac. Gives detail requirements for each grade; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

831.5 NITRATE, AMMONIUM

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Nitrate. Gives requirements for insoluble matter, nonvolatile matter, free acid, chloride, nitrite, phosphate, sulfate, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ammonium Nitrate. Chemical symbol, synonyms, description, and preparations for solution, dilutions, medications, and triturations for use in homoeopathic medicines.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-59D; 1942. Ammonium Nitrate.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

831.6 PHOSPHATE, AMMONIUM

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Phosphate Dibasic (Diammonium Hydrogen Phosphate). Gives requirements for insoluble matter, reaction to phenolphthalein, chloride, nitrate, sulfur compounds, alkali salts, arsenic, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ammonium Phosphate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

831.7 SULPHATE AND PERSULPHATE, AMMONIUM

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Persulfate. Gives requirements for assay, insoluble matter, nonvolatile matter, chloride, manganese, heavy metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Sulfate. Gives requirements for insoluble matter, nonvolatile matter, free acid, chloride, nitrate, phosphate, arsenic, heavy metals, iron, and tests.

U. S. Gov., Treasury Dept., Procurement Div., No. 673; 1944. Ammonium Persulfate (for Photographic Purposes). Covers one type and one grade in white, granular form. Gives ammonium persulfate content, water insoluble matter, residue on ignition, heavy metals, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-17; 1928. Ammonium Persulphate, for Metal-Fouling Solutions.

References.—Unit weights, *see* 830.

831.9 MISCELLANEOUS AMMONIUM COMPOUNDS

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Acetate. Gives requirements for insoluble matter, nonvolatile matter, chloride, nitrate, sulfate, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Oxalate. Gives requirements for insoluble matter, nonvolatile matter, chloride, sulfate, heavy metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Ammonium Thiocyanate. Gives requirements for appearance, insoluble matter, nonvolatile matter, chloride, sulfate, heavy metals, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ammonium Acetate, Ammonium Benzoate, Ammonium Bromid, Ammonium Iodid, Ammonium Picrate, and Ammonium Valerianate. Chemical symbol, synonyms, descriptions, and preparations for solution and triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Acid Ammonium Valerate (Ammonium Valerianate). Gives chemical composition, description, solubility, identifications, loss on drying, residue, reaction, heavy metals; assay for ammonium valerate and assay for free valeric acid; storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammonia Liniment (Volatile Liniment or Hartshorn Liniment). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammonium Bromide. Gives chemical composition, description, solubility, identification, residue on ignition, free acid, other halogen salts, sulfate, barium, heavy metals, iron, bromate, iodide, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammonium Hypophosphite. Gives chemical composition, description, solubility, identification, loss on drying, reaction, oxalate, phosphate, arsenic, calcium, heavy metals, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammonium Iodide. Gives chemical composition, description, solubility, identification, loss on drying, residue, reaction, free iodine, barium, heavy metals, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammonium Salicylate. Gives chemical composition, description, solubility, identification, ash, free acid, heavy metals, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Green Iron and Ammonium Citrates. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Anisated Spirit of Ammonia. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Ammonium Bromide. Gives chemical composition, preparation, assay, alcohol content, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Ammonium Valerate. Gives chemical composition, preparation, alcohol content, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Ichthammol (Ammonium Ichthosulfonate). Gives chemical composition, description, miscibility, identifications, loss on drying, ash, assays for ammonia, ammonium sulfate and total sulfur, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ammonium Acetate. Gives chemical compositions, description, identification, ash, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Ammonium Hypophosphite. Gives chemical composition, preparation, storage, and average dose.

U. S. Gov., Navy Dept. Specification 51 C 38; 1944. Chemicals; Fire-Retardant, for Lumber and Timber.

U. S. Gov., Navy Dept. Specification 51P11a; 1919. Ammonium Picrate.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-35; 1926. Ammonium Perchlorate.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-19; 1923. Ammonia; Caustic.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

832.' POTASSIUM AND POTASSIUM COMPOUNDS

832.1 CYANIDE OF POTASSIUM

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Potassium Cyanid. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

U. S. Gov., Treasury Dept., Procurement Div., No.723; 1945. Potassium Cyanide for Photographic Purposes. Covers one type and one grade in the form of white fragments or granules. Gives requirements for potassium cyanide content, sulfide, heavy metals, and iron; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Unit weights, labeling of poisons, *see* 830.

832.2 CARBONATE OF POTASH

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Potassium Carbonate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Carbonate. Description, solubility, identification, loss on drying, insoluble substances, reaction, arsenic, heavy metals, assay, and storage.

U. S. Gov., Treasury Dept., Procurement Div., No.657; 1944. Potassium Carbonate; Hydrated (for Photographic Purposes). Covers one type and one grade and shall be white, granular in form. Gives requirements for loss on drying, total alkali, bicarbonate content, water insoluble residue, and particle in size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

832.3 CRUDE POTASH AND CAUSTIC POTASH (HYDROXIDE)

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Hydroxide. Gives requirements for potassium hydroxide, potassium carbonate, chloride, sulfate, phosphate, silica and ammonium hydroxide precipitate, nitrogen, iron, heavy metals, and tests.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Potassium Hydroxide. Gives chemical composition, description, specific gravity, identification, reaction, arsenic, assay, storage, preparations, and average dose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Caustic Potash. Covers definition, properties, derivation, impurities, uses, and marketing customs.

U. S. Gov., Navy Dept. Specification 51P7a; 1940. Potash; Carbonate (Granular Form), Caustic (Stick Form), and Crude (Lump Form).

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Hydroxide (Caustic Potash). Description, solubility, identification, reaction, heavy metals, insoluble substances, assay, and storage.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810.

832.4 POTASH SALTS

American Chemical Society. Journal of Industrial and Engineering Chemistry, Volume 19, May 1927, and Volume 3 of Analytical Edition of J.I.E.C., April 15, 1931, and reprint November 1940 Edition. Recommended Specifications for Analytical Reagent Chemicals. Potassium Bromate, Potassium Bromide, Potassium Iodate, Potassium Iodide, Potassium Phosphate. For each, permissible kinds and amounts of impurities; methods of test.

American Chemical Society. Volume 19, May 1927, of Journal of Industrial and Engineering Chemistry as corrected in July 15, 1930, issue. Potassium Chlorate. Reagent for chemical analysis, permissible kinds and amounts of impurities, methods of test.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium and Sodium Tartrate. Gives requirements for insoluble matter, neutrality, chloride, phosphate, sulfate, ammonia, calcium, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Biphthalate. Gives requirements for assay, insoluble matter, loss at 100° C., chlorine compounds. heavy metals iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Bisulfate; Fused. Gives requirements for acidity, insoluble matter and ammonium hydroxide precipitate, chloride, phosphate, arsenic, calcium and magnesium precipitate, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Bromate. Gives requirements for assay, insoluble matter, neutrality, bromide, nitrogen compounds, sulfate, heavy metals, iron, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Bromide. Gives requirements for insoluble matter, neutrality, bromate, chloride, nitrogen compounds, sulfate, barium, calcium, magnesium and ammonium hydroxide precipitate, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Carbonate; Anhydrous. Gives requirements for insoluble matter, loss on ignition, chloride and chlorate, sulfur compounds, nitrogen compounds, phosphate, silica and ammonium hydroxide precipitate, calcium and magnesium precipitate, arsenic, heavy metals, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Chlorate. Gives requirements for insoluble matter, bromate, chloride, nitrogen compounds, sulfate, arsenic, calcium, magnesium and ammonium hydroxide precipitate, heavy metals, iron, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Chloride. Gives requirements for insoluble matter, neutrality, chlorate, and nitrate, nitrogen compounds, phosphate, sulfate, barium, calcium, magnesium and ammonium hydroxide precipitate, heavy metals, iron, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Chromate. Gives requirements for insoluble matter, chloride, free alkali, sulfate, calcium, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Dichromate. Gives requirements for insoluble matter, chloride, sulfate, aluminum, calcium, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Ferricyanide. Gives requirements for insoluble matter, chloride, sulfate, ferro compounds, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Ferrocyanide. Gives requirements for insoluble matter, chloride, sulfate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Iodate. Gives requirements for insoluble matter, neutrality, chloate, chloride and bromide, iodide, nitrogen compounds, sulfate, heavy metals, iron, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Iodide. Gives requirements for insoluble matter, moisture, alkalinity, chloride, bromide, iodate, nitrogen compounds, phosphate, sulfate, barium, calcium, magnesium and ammonium hydroxide precipitate, heavy metals, iron, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Nitrate. Gives requirements for insoluble matter, neutrality, chlorine total, iodate, nitrite, phosphate, sulfate, calcium, magnesium and ammonium hydroxide precipitate, heavy metals, iron, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Oxalate. Gives requirements for insoluble matter, neutrality, chloride, sulfate, ammonia, heavy metals, iron, sodium, substances darkened by hot sulfuric acid, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Permanganate. Gives requirements for appearance, chloride and chlorate, nitrogen compounds, sulfate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Phosphate; Monobasic (Potassium Dihydrogen Phosphate). Gives requirements for insoluble, calcium, and ammonium hydroxide precipitate, loss on drying over sulfuric acid, loss on ignition, hydrogen-ion concentration, chloride, nitrogen compounds, sulfate, heavy metals, iron, sodium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium Sulfate. Gives requirements for insoluble matter, neutrality, chloride, nitrogen compounds, arsenic, calcium, magnesium and ammonium hydroxide precipitate, heavy metals, iron, sodium, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Potassium Acetate, Potassium Arsenite, Potassium Bromid, Potassium Chlorate, Potassium Chlorid, Potassium Chromate, Potassium Dichromate, Potassium Ferrocyanid, Potassium Hydrate, Potassium Hypophosphite, Potassium Iodid, Potassium Nitrate, Potassium Oxalate, Potassium Permanganate, Potassium Phosphate, Potassium Picrate, Potassium Sulfate, and Potassium Tartrate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Effervescent Salt of Potassium Bromide (Effervescent Potassium Bromide With Caffeine). Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Potassium Iodide. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Potassium Chlorate. Gives chemical composition, description, solubility, identifications, reaction, heavy metals, assay, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Potassium Guaiacolsulfonate. Gives chemical composition, description, solubility, identifications, loss on drying, reaction, sulfate, heavy metals, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Potassium Hypophosphite. Gives chemical composition, description, solubility, identification, loss on drying, reaction, free alkali, carbonate, phosphate, arsenic, calcium, heavy metals, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Potassium Sulfate. Gives chemical composition, description, solubility, identification, reaction, chloride, arsenic, calcium, heavy metals, magnesium, sodium, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Potassium Thiocyanate (Potassium Sulfocyanate or Potassium Rhodanate). Gives chemical composition, description, solubility, identification, loss on drying, reaction, chloride, cyanide, sulfate, ammonium salts, arsenic, heavy metals, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Potassium Chlorate. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Potassium Iodide. Gives chemical composition, identification, cyanide, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Potassium Permanganate. Gives chemical composition, identifications, assay, and average dose.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Definitions of Terms for Fertilizers and Liming Materials. Muriate of Potash (Commercial Potassium Chloride). Required percentage of potash (K_2O), chiefly as chloride.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Definitions of Terms for Fertilizers and Liming Materials. Nitrate of Potash (Commercial Potassium Nitrate). Required percentage of potash (K_2O).

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Definitions of Terms for Fertilizers and Liming Materials. Sulphate of Potash (Commercial Potassium Sulphate). Required percentage of potash and permissible content of chlorine.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Definitions of Terms for Fertilizers and Liming Materials. Sulphate of Potash-Magnesia. Required content of potash and of sulphate of magnesia; permissible content of chlorine.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth and Potassium Tartrate. Description, solubility, identification, alcohol-soluble extractive, arsenic, lead, assay, and storage. U.S.P. product of bismuth and potassium tartrate—Injectio Bismuthi et Potassii Tartratis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth and Potassium Tartrate Injection (Bismuth and Potassium Tartrate Ampuls). Aqueous solution, identification, and assay. Oil suspension, identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Effervescent Potassium Citrate. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Acetate. Description, solubility, identification, reaction, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium and Sodium Tartrate (Rochelle Salt). Description, solubility, identification, loss on drying, reaction, ammonia, heavy metals, assay, and storage. U.S.P. product of potassium and sodium tartrate—Pulveres Effervescentes Compositi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Bicarbonate. Description, solubility, identification, reaction, carbonate, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Bitartrate (Cream of Tartar, Acid Potassium Tartrate). Description, solubility, identification, reaction, insoluble matter, ammonia, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Bromide. Description, solubility, identification, loss on drying, alkalinity, bromate, iodide, sulfate, arsenic, barium, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Chloride. Description, solubility, identification, loss on drying, reaction, iodide or bromide, arsenic, calcium and magnesium, heavy metals, sodium, assay, and storage. U.S.P. products of potassium chloride—Liquor Chloridorum Trium Isotonicus, Tabellae Potassii Chloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Chloride Tablets. Identification, calcium and magnesium, sodium, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Citrate. Description, solubility, identification, loss on drying, reaction, tartrate, arsenic, heavy metals, assay, and storage. U.S.P. product of potassium citrate—Potassii Citras Effervescens.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Iodide. Description, solubility, identification, reaction, loss on drying, alkalinity (iodate, nitrite, thiosulfate, and barium), (nitrate, nitrite, and ammonia), heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Nitrate (Saltpeter). Description, solubility, identification, loss on drying, reaction, chlorate, chloride, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium Permanganate. Description, solubility, identification, loss on drying, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Potassium Arsenite (Fowler's Solution). Description, identification, arsenate, assay, alcohol content, and storage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Acid Potassium Phthalate, Sample 84b. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Specification O-P-551; 1944. Potassium Bromide, for Photography. Covers one grade. Gives requirements for color and form, solution, loss on drying, assay, alkalinity, heavy metals, iodide, and bromate; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification O-P-558; 1944. Potassium Iodide, for Photography. Covers one grade. Gives requirements for color and form, solution, loss on drying, assay, alkalinity, heavy metals, iodate, nitrate, thiosulfate, and barium; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51C29a; 1943. Chemicals; Testing, Dissolved-Oxygen.

U. S. Gov., Treasury Dept., Procurement Div., No. 619; 1943. Potassium Dichromate; Technical Grade. Shall be furnished in one grade and in two types—type I, crystals and type II, granular. Gives requirements for potassium dichromate content, volatile matter, water-insoluble matter, particle size, sampling, inspection, and tests.

U. S. Gov., Treasury Dept., Procurement Div., No. 641; 1943. Potassium Ferricyanide (Red Prussiate of Potash); Technical Grade. Covers one type and one grade of ruby-red crystals. Gives requirements for potassium ferricyanide content, ferro-compounds, water insoluble matter, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 666; 1944. Potassium Chloride, for Photographic Purposes. Covers one type and one grade in granular form. Gives requirements for volatile matter, chloride content, precipitates, heavy metals, iron, bromides and iodides, solubility, neutrality, and sodium; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 724; 1945. Potassium Oxalate, for Photographic Purposes. Covers one type and one grade in the form of colorless crystals. Gives requirements for potassium oxalate, heavy metals, iron content, solubility, neutrality, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1025C; 1938. Iodine and Potassium Iodide.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1087A; 1942. Potassium Phosphate; Dipotassium.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-11B; 1936. Potassium Chlorate, for Use in Ammunition.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-26B; 1937. Potassium Nitrate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-93A; 1941. Potassium Sulfate.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810.

832.9 MISCELLANEOUS POTASSIUM COMPOUNDS

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Buchu and Potassium Acetate. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Buchu, Juniper, and Potassium Acetate. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Potassium Bromide. Gives chemical composition, assay, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Gargle of Potassium Chlorate With Iron (Golden Gargle). Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Potassium Citrate. Gives chemical composition, description, identification, reaction, tartrate, arsenic, heavy metals, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Potassium Iodide. Gives chemical composition, description, specific gravity, identification, reaction, other tests, assay, storage, average dose, and preparation.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Potassium Metabisulphite (Potassium Pyrosulphite, Metabisulphite of Potash). Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfurated Potash. Description, solubility, identification, minimum of sulfides, and storage.

U. S. Gov., Treasury Dept., Procurement Div., No. 664a; 1944. Potassium Metabisulfite, for Photographic Purposes. Covers one type and one grade in granular form intended for photographic purposes. Gives requirements for potassium metabisulfite content, heavy metals, iron, and water insoluble matter; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-280; 1943. Powder; Tropic, for Photographic Developers.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-285; 1943. Powder; Hardening, Stop Bath, for Photographic Use.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-300; 1943. Powder; Hardener, Fixing Bath, for Photographic Use.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1068; 1937. Potassium Metabisulfite; Reagent Grade.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-101; 1941. Potassium Perchlorate.

833. CALCIUM AND CALCIUM COMPOUNDS, INCLUDING LIME

833.0 GENERAL ITEMS

American Society for Metals. Metals Handbook, 1939 Edition. Properties of Calcium. Covers physical constants of calcium.

Calcium Chloride Assn. Reprint No. 178. Dehumidification With Calcium Chloride. To End Dampness and Remove Excess Room Moisture. Covers humidity and air conditioning, what "relative humidity" means, high humidity damaging, how calcium chloride dehumidifies, methods of dehumidifying with calcium chloride, simple devices available for calcium chloride, and solution from dehumidification, has many valuable uses.

833.1 CALCIUM CARBIDE

U. S. Gov., Army Air Forces. Specification 20028-A (1); 1943. Charge; Welding (Portable Welding Equipment Set).

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-90-S. Carbide, All Kinds.

U. S. Gov., Federal Specification O-C-101; 1930. Amendment 4; 1944. Calcium-Carbide. Covers one grade. Gives requirements for material, sizes (lump, egg, nut, 1/4 by 1/12, rice, and 14 N.D.), and volume of gas; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 558; 1942. Acetylene; Technical Grade (for Use in Cutting and Welding). Shall be furnished in but one grade. Gives capacity of cylinders and requirements for gas, acetone, cylinders, and valves; methods of sampling, inspection, and tests; and packaging, packing, and marking.

833.2 CALCIUM CHLORIDE

American Chemical Society. Specifications for Analytical Reagents, 1941. Calcium Chloride. Gives requirements for assay, insoluble and ammonium hydroxide precipitate, alkalinity, acidity, nitrate, sulfate, ammonia, barium, heavy metals, iron, magnesium and alkali salts, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Calcium Chloride; Anhydrous. Gives requirements for assay, alkalinity, magnesium and alkali salts, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Calcium Chlorid. Chemical symbol, synonyms, description, and preparations for solution, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Forumlary, Seventh Edition, 1942. Ampuls of Calcium Chloride. Gives chemical composition, assay, and average dose.

American Society for Testing Materials, D 98-34; 1934. Calcium Chloride. Includes use for dust prevention, acceleration of setting of concrete, and curing concrete. Gives requirements for chemical composition, screen analysis, and packing.

American Society for Testing Materials, D 345-34; 1934. Methods of Chemical Analysis of Calcium Chloride. Includes determination of total calcium, total alkalinity and magnesium compounds, total alkali chlorides as sodium chloride, and a rapid technical method for ordinary use, with explanatory notes. Title and section 1 tentatively revised and new sections 2 and 3 tentatively added 1941.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Calcium Chloride. Covers color and properties, derivation, solubility, purity, uses, grades, supply, and packing.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Calcium Chloride. Description, solubility, identification, reaction, iron, aluminum, phosphate, magnesium and alkali salts, heavy metals, assay, and storage. U.S.P. product of calcium chloride—Liquor Chloridum Trium Isotonicus.

U. S. Gov., Federal Specification O-C-106a; 1944. Amendment 1; 1944. Calcium-Chloride; Hydrated, Technical Grade. Covers one type and one grade in flake form. Gives requirements for calcium-chloride content, impurities, and particle sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 470; 1941. Calcium Chloride; Hydrated, Special (for Anti-Freeze Use in Fire-Extinguishers). Shall be furnished in one type and grade. Gives requirements for particle size and chemical composition; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 622; 1943. Calcium Chloride; Anhydrous, Technical Grade. Shall be in one type, one grade, and two classes—(A) granular and (B) lump. Intended for use as a desiccating (drying) agent. Calcium chloride shall not be caked in the container. Gives requirements for calcium chloride content, impurities, and particle size of granular and lump; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-82-2; 1939. Calcium Chloride; Technical Grades.

References.—Chloride of lime bleach, *see* 891; unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

833.3 CALCIUM CARBONATE

American Chemical Society. Specifications for Analytical Reagents, 1941. Calcium Carbonate. Gives requirements for insoluble in hydrochloric acid and ammonium hydroxide precipitate, alkalinity, chloride, nitrate, sulfate, ammonia, barium, heavy metals, iron, magnesium and alkali salts, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Calcium Carbonate—Low in Alkalies. Gives requirements for insoluble in hydrochloric acid and ammonium hydroxide precipitate, chloride, sulfate, alkalies, barium, heavy metals, iron, magnesium and alkalies, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Calcium Carbonate of Hahnemann. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Calcium Carbonate. Gives chemical composition, identification, barium or strontium, assay, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Compound Chalk Powder. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Precipitated Calcium Carbonate (Precipitated Chalk). Description, solubility, identification, loss on drying, acid-insoluble material, barium, heavy metals, iron, magnesium and alkali salts, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Prepared Chalk (Drop Chalk). Description, solubility, identification, acid-insoluble residue, heavy metals, assay, and storage. U.S.P. products of prepared chalk—Hydrargyrum cum Creta, Mistura Cretae, Pulvis Cretae Compositus.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-31-11; 1938. Calcium Carbonate; Whiting, Commercial.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810; chalk, ceramic whiting, *see* 546; limestone, *see* 511.2.

833.4 CALCIUM PHOSPHIDE AND CALCIUM PHOSPHATE

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tribasic Calcium Phosphate (Precipitated Calcium Phosphate). Description, solubility, identification, loss on ignition, acid-insoluble matter, soluble salts, carbonate, chloride, nitrite, sulfate, arsenic, barium, dibasic salt and calcium oxide, fluorine, heavy metals, and assay.

U. S. Gov., Navy Dept. Specification 51C2d; 1940: Calcium Phosphide.

833.5 CAUSTIC (QUICKLIME) AND HYDRATED LIME

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Calcium Hydrate. Chemical symbol, synonyms, description, and preparations for solutions, dilutions, and triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lime (Calcium Oxide or Quicklime). Gives chemical composition, description, solubility, identifications, insoluble substances loss on ignition, reaction, carbonate; alkalies or magnesium; assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lime Liniment (Carron Oil). Gives chemical composition, preparation, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Calcium Hydroxide. Description, solubility, identification, hydrochloric acid-insoluble matter, carbonate, heavy metals, magnesium, assay, and storage. U.S.P. product of calcium hydroxide—Liquor Calcii Hydroxide.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Soda Lime. Description, size of granules, identification, moisture absorption, loss on drying, carbon dioxide absorption capacity, hardness, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Calcium Hydroxide (Lime Water). Description, identification, reaction, alkalies and other carbonates, assay, and storage.

U. S. Gov., Treasury Dept., Procurement Div., No.710; 1944. Calcium Hydroxide; Technical Grade. Covers one type and one grade in the form of fine white powder. Gives requirements for calcium hydroxide content and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-112; 1941. Soda-Lime for Medical Use.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810; quicklime and hydrated lime for water treatment, *see* 882.2; quicklime and hydrated lime for various other purposes, *see* 517.2.

833.9 MISCELLANEOUS CALCIUM COMPOUNDS

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Calcium Acetate of Hahnemann, Calcium Arsenate, Calcium Bromid, Calcium Fluorid, Calcium Iodid, Calcium Oxalate, Calcium Phosphate, Calcium Sulfate, and Impure Calcium Sulfid. Chemical symbol, synonyms, and preparations for solution, dilutions, triturations, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calcium Bromide. Gives chemical composition, description, solubility, identification, reaction, chloride, bromate, iodide, sulfate, barium, heavy metals, iron, and magnesium and alkali salts; assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calcium Creosotate. Gives chemical composition, description, solubility, identifications, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calcium Glycerophosphate. Gives chemical composition, description, solubility, identifications, loss on drying, alcohol-soluble substances, free alkali, chloride, phosphate, sulphate, arsenic, heavy metals, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Calcium Hypophosphite. Gives chemical composition, description, solubility, identification, loss on drying, water-insoluble substances, phosphorous compounds, arsenic, heavy metals, free acid, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Calcium Lactophosphate. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Calcium and Sodium Glycerophosphates. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Calcium Lactophosphate. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Calcium Lactate. Gives chemical composition, identification, assay, and average dose.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Calcium Cyanide. Methods for determination of cyanogen and chlorine.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Calcium Aluminate. Covers definition, constants, specifications, solubility, derivation, uses, and containers.

Technical Assn. of the Pulp and Paper Industry. Analysis of Bisulphite Cooking Liquor. Standard T604 m-35; 1935. For control tests in mill using volumetric control analysis and complete gravimetric analysis. Preparation of sample and outlines of each method of testing.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Calcium Gluconate. Description, solubility, identification, reaction, chloride, sulfate, arsenic, heavy metals, sucrose and reducing sugars, assay and storage. U.S.P. product of calcium gluconate—Injectio Calcii Gluconatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Calcium Gluconate Injection (Calcium Gluconate Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Calcium Iodobehenate. Description, solubility, loss on drying, identification, magnesium and alkali salts, carbonate, soluble salts, chloride and sulfate, inorganic salts, assay for iodine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Calcium Lactate, Description, solubility, identification, loss on drying, free acid, heavy metals, magnesium and alkali salts, volatile fatty acid, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Calcium Mandelate. Description, solubility, identification, loss on drying, completeness and clarity of solution, free acid, chloride, sulfate, heavy metals, magnesium and alkali salts, assay, and storage.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Calcium Molybdate, Sample 71. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Treasury Dept., Procurement Div., No. 725; 1945. Calcium Sulfate; Anhydrous (for Drying and Desiccating Purposes). Covers one type and one grade and shall be in granular form. Gives requirements for water absorption, temperature rise, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-89A; 1941. Calcium Resinate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-105; 1941. Calcium Fluoride.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810; calcium fertilizers, *see* 850-859; calcium arsenate and insecticides, *see* 881.12; gypsum, calcined gypsum, *see* 514.1, 514.2.

834. SODIUM AND SODIUM COMPOUNDS

834.0 GENERAL ITEMS

American Society for Testing Materials, D 501-43; 1943. Methods of Sampling and Chemical Analysis of Special Detergents. Covers inorganic alkaline detergents. Gives procedure for sampling and testing caustic soda, soda ash, modified soda (sesquicarbonate type), sodium metasilicate and sodium sesquisilicate, trisodium phosphate, and tetrasodium pyrophosphate.

834.1 SODIUM CYANIDE

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Cyanide. Gives requirements for assay, chloride, ferrocyanide, sulfate, sulfide, thiocyanate, and tests.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Sodium and Potassium Cyanides. Official methods for determination of cyanogen and chlorine.

U. S. Gov., Federal Specification O-S-591; 1930. Amendment 1, 1934. Sodium-Cyanide; for Use As an Insecticide in Fumigation. Covers one grade. Gives detail requirements; method of sampling, inspection, and test; and requirements for packaging, packing, and marking.

References.—Unit weights, labeling of poisons, *see* 830.

834.2 SODIUM NITRATE

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Nitrate. Gives requirements for insoluble matter, neutrality, chlorine total, iodate, nitrite, phosphate, sulfate, calcium and magnesium precipitate, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sodium Nitrate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Definitions of terms for Fertilizers and Liming Materials. Nitrate of Soda (Commercial Sodium Nitrate). Required percentage of nitrogen, chiefly as sodium nitrate.

U. S. Gov., Navy Dept. Specification 51S31a; 1941. Sodium Nitrate (for Use in the Heat Treatment of Aluminum Alloy).

U. S. Gov., Treasury Dept., Procurement Div., No. 617a; 1944. Sodium Nitrate (Nitrate of Soda), (for Fertilizer Purposes). Covers one type and one grade in granular or pellet form. Gives requirements for nitrogen content, moisture and other volatile matter, water-insoluble matter, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Unit weights, *see* 830.

834.3 SODIUM BORATE (BORAX)

American Chemical Society. Specifications for Analytical Reagents, 1941. Borax (Sodium Borate). Gives requirements for insoluble matter, chloride, phosphate, sulfate, calcium, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sodium Pyroborate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Borax, 1942. Gives requirements for sodium borate, insoluble matter, iron, aluminum, calcium, magnesium, sulfate, chloride, and free alkali.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound solution of Sodium Borate (Dobell's Solution). Gives chemical composition, description, identifications, reaction, storage, use on mucous membranes, and preparation.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Borax; Dehydrated (Sodium Tetraborate; Anhydrous—Borax "Glass"; Calcined or "Burnt" Borax, Etc.). Covers definition, constants, derivation, purity, grades, containers, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Borax (Sodium Tetraborate Dehydrate, Sodium Biborate, or Sodium Borate). Covers definitions, constants, solubility, occurance purity, grades, substitutes, containers, uses, and marketing.

Toilet Goods Assn., Inc. Specification No. 4; 1941. Borax. Gives requirements for color, odor, identity, $Na_2B_4O_7$, $Na_2B_4O_7 10H_2O$, solubility, pH, carbonates and bicarbonates, arsenic, lead, and other heavy metals.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Borate (Borax, Sodium Tetraborate). Description, solubility, identification, reaction, carbonate or bicarbonate, arsenic, heavy metals, assay, and storage.

U. S. Gov., Federal Specification SS-B-611; 1933. Amendment 1; 1942. Borax (Sodium Borate). Covers one grade, and three types—(A) crystal, (B) granulated, and (C) powdered. Gives requirements for material; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

834.4 SODIUM CARBONATE, SODA ASH

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Carbonate; Anhydrous. Gives requirements for insoluble matter, loss on ignition, chloride, sulfur compounds, nitrogen compounds, phosphate, silica and ammonium hydroxide precipitate, calcium and magnesium precipitate, potassium, arsenic, heavy metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Carbonate; Anhydrous (2). Gives requirements for insoluble matter, ammonium hydroxide precipitate, and tests.

American Hospital Assn., 16-22. Soda Ash. Covers three types—ordinary or light, extra-light, and dense. Based on U. S. Gov. Federal Specification O-S-571a for Soda Ash, referred to below.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sodium Carbonate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Soda Ash, 1942. Gives requirements for total alkali, sodium bicarbonate, sodium carbonate, and sodium chloride.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Soda Ash To Be Used in Water Treatment. Gives requirements for chemical and physical properties and tests, packing and marking, and inspection and rejection.

American Society for Testing Materials D 458-39; 1939. Soda Ash. For material suitable for various washing, cleaning, and scouring processes, with or without soap, where a moderately strong alkaline material is desired; composed of high-grade anhydrous sodium carbonate in powdered form; requirements as to chemical composition, loss on heating, light and extra light types, and tests using A.S.T.M. Method D 501.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Soda Ash. Covers definition, constants, solubility, derivation, purity, grades, specifications, containers, and uses.

Technical Assn. of the Pulp and Paper Industry. Analysis of Soda Ash (Anhydrous Sodium Carbonate). Standard T 612 m-44; 1944. For 58 percent grade for paper manufacturing. Covers specifications, sampling, preliminary procedure for tests, total alkalinity, hydroxide, bicarbonate, matter insoluble in water, and loss at 150° C.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Monohydrated Sodium Carbonate. Description, solubility, identification, loss on drying, heavy metals, assay, and storage.

U. S. Gov., Federal Specification O-S-571a; 1939. Amendment 1; 1944. Soda Ash. Covers three types—(I) 58 percent ordinary or light, (II) 58 percent extra-light, and (III) 58 percent dense. Gives requirements for material, chemical composition, loss of weight at 150° to 155° C., and volume; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification O-S-581a; 1939. Sodium-Carbonate; Granular (Monohydrate-Crystals). Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 642; 1943. Sodium Carbonate; Anhydrous (for Photographic Purposes). Covers one grade of uniform white powder. Gives requirements for total alkali calculated as sodium carbonate, sodium bicarbonate content, and matter insoluble in water; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Soda ash for boiler compound, *see* 882.2; laundry soda, *see* 834.7; unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

834.5 SODIUM BICARBONATE

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Bicarbonate. Gives requirements for insoluble matter, assay and carbonate, chloride, sulfur compounds, phosphate, calcium, magnesium and ammonium hydroxide precipitate, potassium, ammonia, heavy metals, and tests.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sodium Bicarbonate, 1942. Gives requirements for water, sodium hydroxide, carbonate, bicarbonate, hydroxide and carbonate, insoluble matter, iron, aluminum, calcium, magnesium, sulfate, and chloride.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mixture of Rhubarb and Soda. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Soda and Mint. Gives chemical composition, description, identifications, reaction, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Sodium Bicarbonate. Gives chemical composition, identifications, assay, and average dose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Sodium Bichromate. Covers definition, constants, solubility, purity, grades, forms available, containers, uses, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Bicarbonate (Baking Soda). Description, solubility, identification, insoluble substances, reaction, carbonate, ammonia, arsenic, heavy metals, assay, and storage.

U. S. Gov., Federal Specification O-S-576; 1944. Sodium Bicarbonate; Technical Grade. Covers one type and one grade in powdered form. Gives requirements for total alkali, loss on heating, and chlorides; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Baking soda, laundry soda; *see* 155.2, 834.7; unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

834.6 SODIUM SILICATE (WATER GLASS)

American Society for Testing Materials, C 111-36; 1936. Sodium Silicate for Curing Concrete. For application to the surface of concrete for preventing moisture loss during curing. Covers formula and specific gravity, requirements for container size and type, and marking.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Sodium Silicate (Water Glass, Soluble Glass, Sodium Metasilicate). Covers definition, derivation, constants, solubility, uses, grades and forms, containers, and substitutes.

U. S. Gov., Federal Specification O-S-604; 1940. Sodium-Metasilicate; Pentahydrate. Covers one type. Gives detail requirements; method of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification O-S-605; 1942. Sodium-Silicate; Liquid. Covers one type and one grade. Gives requirements for consistency, specific gravity, and alkali content; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51S29; 1939. Sodium-Silicate; Solution (33.5° Baumé).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-1035A; 1939. Sodium Silicate (Water Glass).

834.7 HYDRATED OR SAL SODA (WASHING SODA)

American Hospital Assn., 7-40. Modified (Washing Soda) Laundry Soap. Covers one grade. Based on U. S. Gov. Federal Specification P-S-641a and Amendment 1.

U. S. Gov., Federal Specification P-S-641a; 1939. Amendment 1; 1940. Soda; Laundry, Modified (Washing Soda). Covers one grade—white uniform powder. Gives requirements for composition, alkalinity, sodium bicarbonate, sodium carbonate, and matter insoluble in water; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

834.8 CAUSTIC SODA OR LYE

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Hydroxide. Gives requirements for sodium hydroxide, sodium carbonate, chloride, sulfate, phosphate, silica and ammonium hydroxide precipitate, nitrogen, iron, heavy metals, and tests.

American Hospital Assn., 7-37. Caustic (Lye) Soda for Cleaning Purposes. Covers one grade. Based on U. S. Gov. Federal Specification P-S-631a.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sodium Hydrate. Chemical symbol, synonyms, description, and preparations for solutions, dilutions, and medications for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Caustic Soda, 1942. Gives requirements for total alkali, sodium hydrate, sodium carbonate, sodium chloride, and sodium sulfate.

American Society for Testing Materials, D 456-39; 1939. Caustic Soda. For various washing, cleaning, and scouring processes, with or without soap, where strongly alkaline material is desired. Includes flake, coarsely powdered, or solid form in air-tight containers, requirements as to chemical composition, and analysis using A.S.T.M. Method D 501.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Soda Lye. Official methods for determination of carbonate and of hydroxide.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Caustic Soda. Covers definition, properties, derivation, impurities, uses, forms available, commercial grades, marketing, shipping regulations, and substitutes.

Technical Assn. of the Pulp and Paper Industry. Analysis of Sodium Hydroxide (Caustic Soda). Standard T 613 m-44; 1944. For standard commercial solid, flake, ground, and liquid material. Covers sampling, apparatus, preparation of solution, total alkali, sodium hydroxide, sodium carbonate, alkalies by double titration, sodium chloride, and sodium sulphate.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Hydroxide (Caustic Soda). Description, solubility, identification, reaction, heavy metals, potassium, insoluble substances and organic matter, assay, and storage.

U. S. Gov., Army Air Forces. Specification 31315; 1943. Powders; Sodium Hydroxide, Film Reversal (for Photographic Use).

U. S. Gov., Federal Specification P-S-631a; 1939. Soda; Caustic (Lye), (for Cleaning Purposes). Covers one grade in flake, ground, or lump form. Gives requirements for sodium hydroxide and for carbonate; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51S7; 1913. Soda; Caustic, Smokeless Powder.

U. S. Gov., Navy Dept. Specification 51S26b; 1938. Soda Lime.

U. S. Gov., Treasury Dept., Procurement Div., No. 638; 1943. Sodium hydroxide (for Photographic Purposes). Covers one type and one grade of flake, granular, or pellet form and shall not be caked in the container. Gives requirements for sodium hydroxide content, sodium carbonate content, and chlorides; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-1006A; 1936. Sodium Hydroxide for Use in Recoil Mechanisms.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-15; 1923. Soda; Caustic.

References.—Unit weights, labeling of poisons, *see* 832; Food and Drugs Act and Regulations, *see* 810.

834.9 MISCELLANEOUS SODIUM COMPOUNDS

American Chemical Society. Specifications for Analytical Reagents, 1941. Potassium and Sodium Tartrate. Gives requirements for insoluble matter, neutrality, chloride, phosphate, sulfate, ammonia, calcium, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Acetate. Gives requirements for insoluble matter, neutrality, chloride, phosphate, sulfate, calcium, magnesium, and ammonium hydroxide precipitate; heavy metals, iron, substances reducing permanganate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Bismuthate. Gives requirements for assay, chloride, manganese, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Bisulfate; Fused. Gives requirements for acidity, insoluble matter and ammonium hydroxide precipitate, chloride, phosphate, arsenic, calcium, and magnesium precipitate; heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Chloride. Gives requirements for insoluble matter, neutrality, chlorate and nitrate, nitrogen compounds, phosphate, sulfate, ammonium hydroxide precipitate, barium, calcium, and magnesium precipitate; heavy metals, iron, potassium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Fluoride. Gives requirements for insoluble matter, chloride, free acid, free alkali, sodium fluosilicate, sulfate, sulfite, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Metal. Gives requirements for chloride, nitrogen, phosphate, sulphate, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Nitrite. Gives requirements for insoluble matter, assay, chloride, sulfate, calcium, heavy metals, iron, potassium, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Nitroferricyanide. Gives requirements for insoluble matter, chloride, sulfate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Oxalate. Gives requirements for moisture, insoluble matter, chloride, sulfate, neutrality, iron, potassium, substances darkened by hot sulfuric acid, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Peroxide. Gives requirements for assay, chloride, nitrogen compounds, phosphate, sulfate, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium phosphate; Dibasic (Disodium Hydrogen Phosphate). Gives requirements for insoluble matter, neutrality chloride, nitrogen compounds, sulfate, arsenic, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Sulfate; Annydrous. Gives requirements for insoluble matter, loss on ignition, neutrality, chloride, nitrogen compounds, arsenic, calcium, magnesium, and ammonium hydroxide precipitate; heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Sulfide. Gives requirements for appearance, ammonium compounds, sulfite, thiosulfate, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Sulfite; Anhydrous. Gives requirements for assay, insoluble matter, free acid, free alkali, chloride, arsenic, heavy metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Thiosulfate. Gives requirements for insoluble matter, sulfate and sulfite, sulfide, neutrality, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Sodium Tungstate. Gives requirements for insoluble matter, alkalinity, chloride, molybdenum, nitrogen compounds, sulfate, neavy metals, and tests.

American Hospital Assn., 7-43. Technical Trisodium Phosphate (Phosphate Cleaner). Covers one grade and either granular, flake or crystalline. Based on U. S. Gov. Federal Specification O-T-671a.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Sodium Arsenate. Sodium Bromid, Sodium Chlorid, Sodium Hypophosphite, Sodium Phosphate, Sodium Salicylate, Sodium Sulfate, Sodium Sulfite, and Sodium Solfo-Carbolate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sodium Bisulfite (Sodium Metabisulfite), 1942. Gives general requirements and procedure.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sodium Chloride, 1942. Gives requirements for water, inorganic insoluble matter, examination of insoluble matter, iron, colorimetric test for iron, aluminum, calcium, magnesium, sulfates, and chlorides.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sodium Dichromate, 1942. Gives requirements for chromium as chromic trioxide, free chromic acid, sodium dichromate, and sodium chromate.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sodium Sulfate and Sodium Acid Sulfate, 1942. Gives requirements for insoluble matter, iron and aluminum, calcium, magnesium, sulfates, chlorides, and free acid.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sodium Sulfide, 1942. Gives requirements for sodium sulfide, iron, and sodium sulfite-sodium thiosulfate.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sodium Sulfite, 1942. Gives requirements for total sulfur dioxide, sulfurous acid, bisulfite, sulfite, free alkali, carbonate, insoluble matter, iron and aluminum, calcium, magnesium, sulfates, and chlorides.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Sodium Cacodylate. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Sodium Iodide. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Sodium Salicylate. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Sodium Salicylate and Iodide. Gives chemical composition, assay for sodium salicylate and for sodium iodide, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Sodium Salicylate and Iodide With Colchicine. Gives chemical composition, identification, assay for sodium salicylate and for sodium iodide, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Sodium Thiosulfate (Ampuls of Sodium Hyposulfite). Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Caffeine With Sodium Salicylate. Gives chemical composition, preparation, assay for caffeine and for sodium salicylate, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Elixir of Sodium Salicylate. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Diluted Solution of Sodium Hypochlorite (Modified Dakin's Solution). Gives chemical composition, description, specific gravity, total solids, alkalinity, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Calcium and Sodium Glycerophosphates. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Sodium Bromide. Gives chemical composition, assay, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Sodium Salicylate. Gives chemical composition, assay, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Sodium Thiocyanate (Elixir of Sodium Sulfocyanate). Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Exsiccated Sodium Arsenate. Gives chemical composition, description, solubility, identification, loss on drying, reaction, nitrate, limit of arsenite; lead, copper, or iron; assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Exsiccated Sodium Sulfate. Gives chemical composition, description, solubility, identification, loss on drying, reaction, chloride, arsenic, calcium, heavy metals, magnesium, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Honey of Rose and Sodium Borate (Honey of Rose and Borax). Gives chemical composition and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. N. F. Aromatic Sodium Perborate. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sodium Acetate. Gives chemical composition, description, solubility, identifications, loss on drying, free alkali, arsenic, heavy metals, potassium compounds, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sodium Glycerophosphate. Gives chemical composition, description, solubility, identifications, reaction, free alkali, alcohol-soluble impurities, phosphate, arsenic, heavy metals, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sodium Hypophosphite. Gives chemical composition, description, solubility, identification, loss on drying, reaction, free alkali, carbonate, phosphate, arsenic, calcium, heavy metals, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Sodium Thiocyanate (Sodium Sulfocyanate or Sodium Rhodanate). Gives chemical composition, description, solubility, identification, loss on drying, reaction, chloride, cyanide, sulfate, ammonium salts, arsenic, heavy metals, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Sodium Arsenate. Gives chemical composition, description, identification, reaction, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Sodium Citrate (Potio Riverii, Mistura Sodii Citratis). Gives chemical composition, description, identifications, reaction, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Sodium Phosphate. Gives chemical composition, description, specific gravity, identification, reaction, arsenic, heavy metals, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Caffeine With Sodium Benzoate. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Methenamine and Sodium Biphosphate (Tablets of Methenamine and Acid Sodium Phosphate). Gives chemical composition, edentifications, aluminum and calcium, ammonium salts, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Sodium Bromide. Gives chemical composition, identification, chloride, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Theobromine With Sodium Salicylate. Gives chemical composition, description, solubility, identifications, loss on drying, water-insoluble substances, reaction, carbonate, caffeine, assay for theobromine and for salicylic acid, storage, and average dose.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Salt To Be Used in Regeneration of Zeolite Water Softening Plants. Covers crushed rock salt and evaporated salt. Gives requirements for chemical and physical properties, tests, packing, marking, inspection, penalization, and rejection.

American Society for Testing Materials, D 457-39; 1939. Modified Soda (Sesquicarbonate Type). For common laundry soda used for washing, cleaning, and scouring, with or without soap, where a mildly alkaline material is desired; in crystal or powder form. Requirements for sodium carbonate and sodium bicarbonate, chemical composition, and tests using A.S.T.M. Method D 501.

American Society for Testing Materials, D 537-41; 1941. Sodium Metasilicate. For various washing, cleaning, and scouring processes, with or without soap, where a moderately strong alkaline material is desired. Gives chemical composition, basis of purchase, and methods of sampling and analysis.

American Society for Testing Materials, D 538-44; 1944. Trisodium Phosphate. Covers material suitable for various washing, cleaning, and scouring processes, with or without soap, where a moderately strong alkaline material is desired. Covers a white uniform product in either flake, granular, or crystalline form. Gives requirements for chemical composition, bases of purchase, and methods of sampling and testing.

American Society for Testing Materials, D 594-41; 1941. Sodium Sesquisilicate. A strongly alkaline material for washing, cleaning, and scouring processes, with or without soap. Requirements for light colored, uniform, granular product. Chemical composition, basis of purchase, and methods of sampling and analysis.

American Society for Testing Materials, D 595-44 T; 1944. Tentative Specifications for Tetrasodium Pyrophosphate (Anhydrous). A mildly alkaline material with water softening properties for washing, cleaning, and scouring processes with soap or other detergents. Requirements for a white uniform product in granular or powdered form and chemical composition.

American Society for Testing Materials, D 632-43; 1943. Sodium Chloride. Covers sodium chloride to be used for road purposes. Gives requirements for chemical composition, grading, packing, marking, inspection, and rejection.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Waters, Brine, and Salt. Brine, Tentative Methods. Determination of iodine in presence of chlorine and bromine, of bromine in presence of chlorine but not iodine, and of bromine in presence of chlorine and iodine.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Waters, Brine, and Salt. Salt. Tentative methods for determination of moisture, matters insoluble in water, sulphate, calcium, and magnesium.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Salt Cake. Covers definition, uses, grades, and containers.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Sodium Acetate. Covers definition, constants, derivation, solubility, specifications, uses, grades, and packing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Sodium Aluminate. Covers definition, constants, grades, solubility, derivation, uses, and containers.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Sodium Bifluoride. Covers definition, constants, specifications, solubility, derivation, uses, and containers.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Sodium Fluoride. Covers definition, constants, derivation, grades, specifications, containers, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Sodium Sulphide. Covers definition, constants, derivation, solubility, purity, uses, grades, packing, and shipping regulations.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Disodium Phosphate. Covers definition, constants, acidity, solubility, derivation, grades, containers, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Sodium Alginate (Algin). Covers definition, solubility, reaction, uses, derivation, forms, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Sodium Chlorite. Covers definition, constants, solubility, stability, uses, grades, packing, hazards, and substitutes.

Technical Assn. of the Pulp and Paper Industry. Analysis of Salt Cake. Standard T 619 m-44; 1944. Salt Cake is an anhydrous sodium sulphate which contains varying amounts of impurities. Covers preparation of sample, complete analysis, and short analysis.

Technical Assn. of the Pulp and Paper Industry. Analysis of Sodium Hydrosulphite. Standard T 622 m-42; 1942. Used as a reducing agent and formed by treating solutions of sodium bisulphite with zinc dust. Covers reagents, sampling, procedure, report, and additional information.

Technical Assn. of the Pulp and Paper Industry. Determination of Sodium by the Uranyl Zinc Acetate Method. Tentative Standard T 623 m-44; 1944. This method is particularly applicable to chemical inventories of soluble sodium compounds about a mill on account of its speed. Covers apparatus, reagents, preparation of sample, procedure, calculation, precision, and notes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Anticoagulant Solution of Sodium Citrate. Description, identification, hydrogen ion cencentration, limit of sodium chloride, assay for sodium citrate, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Barbital Sodium. Description, solubility, melting point, identification, loss on drying, carbonizable substances, reaction, chloride, sulfate, heavy metals, uncombined barbital, assay, and storage. U.S.P. product of barbital sodium—Tabellae Barbitali Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Barbital Sodium Tablets (Soluble Barbital Tablets). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Caffeine and Sodium Benzoate. Description, solubility, identification, loss on drying, carbonizable substances, reaction, chlorinated compounds, heavy metals, assay for caffeine, assay for sodium benzoate, and storage. U.S.P. product of caffeine and sodium benzoate—Injectio Caffeinae et Sodii Benzoatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Caffeine and Sodium Benzoate Injections (Caffeine and Sodium

Benzoate Ampuls). Identification, assay for caffeine, assay for sodium benzoate, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chloramine-T. Description, solubility, identification, carbonizable substances, reaction, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dextrose and Sodium Chloride Injection (Dextrose and Sodium Chloride Ampuls). Identification, heavy metals, assay for dextrose, assay for sodium chloride, pyrogens, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diphenylhydantoin Sodium. Description, solubility, identification, reaction, loss on drying, clarity and color of solution, chloride, sulfate, heavy metals, assay, and storage. U.S.P. product of diphenylhydantoin sodium—Capsulae Diphenylhydantoini Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Diphenylhydantoin Sodium Capsules. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Effervescent Sodium Phosphate. Preparation and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Exsiccated Sodium Phosphate (Dried Sodium Phosphate). Description, solubility, identification, loss on drying, other tests, assay, and storage. U.S.P. product of exsiccated sodium phosphate—Sodii Phosphas Effervescens.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Exsiccated Sodium Sulfite. Description, solubility, identification, reaction, thiosulfate, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Fluorescein Sodium (Soluble Fluorescein). Description, solubility, identification, loss on drying, chloride, sulfate, zinc, acriflavine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iodophthalein Sodium (Soluble Iodophthalein, Tetraiodophenolphthalein Sodium, Tetraiodophthalein Sodium, Tetiothalein Sodium). Description, solubility, identification, free phthalein, assay for tetraiodophenolphthalein, assay for iodine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Isotonic Solution of Sodium Chloride (Physiological Salt Solution, Normal Saline Solution). Description, hydrogen ion concentration, identification, heavy metals, arsenic, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pentobarbital Sodium (Soluble Pentobarbital). Description, solubility, identification, loss on drying, carbonizable substances, reaction, chloride, sulfate, heavy metals, free pentobarbital, assay, and storage. U.S.P. products of pentobarbital sodium—Capsulae Pentobarbitali Sodici, Tabellae Pentobarbitali Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pentobarbital Sodium Capsules (Soluble Pentobarbital Capsules). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pentobarbital Sodium Tablets (Soluble Pentobarbital Tablets). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenobarbital Sodium (Soluble Phenobarbital, Soluble Phenobarbitone). Description, solubility, identification, loss on drying, carbonizable substances, reaction, chloride, sulfate, heavy metals, free phenobarbital, assay, and storage. U.S.P. product of phenobarbital sodium—Tabellae Phenobarbitali Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenobarbital Sodium Tablets (Soluble Phenobarbital Tablets). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Phenolsulfonphthalein Injection (Phenolsulfonphthalein Ampuls). Identification, sensitiveness, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Potassium and Sodium Tartrate (Rochelle Salt). Description, solubility, identification, loss on drying, reaction, ammonia, heavy metals, assay, and storage. U.S.P. product of potassium and sodium tartrate—Pulveres Effervescentes Compositi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Saccharin Sodium (Soluble Saccharin, Soluble Gluside, Sodium Benzosulfimide). Description, solubility, identification, reaction, heavy metals, benzoate and salicylate, other tests, and storage. U.S.P. product of saccharin sodium—Tabellae Saccharini Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Benzoate. Description, solubility, identification, loss on drying, alkalinity, heavy metals, chlorinated compounds, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Biphosphate (Sodium Dihydrogen Phosphate, Monosodium Orthophosphate, Sodium Acid Phosphate). Description, solubility, identification, loss on drying, reaction, free acid and disodium phosphate, chloride, sulfate, ammonium, calcium, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Bromide. Description, solubility, identification, loss on drying, alkalinity, bromate, iodide, sulfate, arsenic, barium, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Cacodylate. Description, solubility, melting temperature, identification, monomethylarsenate, arsenate or phosphate, chloride, sulfate, alkalinity or acidity, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Chloride.

Description, solubility, identification, reaction, iodide or bromide, barium, calcium and magnesium, arsenic, heavy metals, assay, and storage. U.S.P. products of sodium chloride—Injectio Dextrosi et Sodii Chloridi, Liquor Chloridorum Trium Isotonicus, Liquor Sodii Chloridi Isotonicus.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Citrate. Description, solubility, identification, loss on drying, reaction, tartrate, arsenic, heavy metals, assay, and storage. U.S.P. product of sodium citrate—Liquor Sodii Citratis Anticoagulans.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Iodide. Description, solubility, identification, loss on drying (iodate, nitrite, thiosulfate, and barium), (nitrite, nitrate, and ammonia), alkalinity, heavy metals, potassium, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Nitrite. Description, solubility, identification, loss on drying, reaction, heavy metals, assay, and storage. U.S.P. product of sodium nitrite—Tabellae Sodii Nitritis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Nitrite Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Perborate. Description, solubility, identification, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Phosphate. Description, solubility, identification, loss on drying, insoluble substances, reaction, chloride, sulfate, arsenic, heavy metals, assay, and storage. U.S.P. products of sodium phosphate—Sodii Phosphas Effervescens, Sodii Phosphas Exsiccatus.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Salicylate. Description, solubility, identification, loss on drying, reaction, sulfite or thiosulfate, heavy metals, assay, and storage. U.S.P. product of sodium salicylate—Tabellae Sodii Salicylatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Salicylate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Stearate. Description, solubility, identification, loss on drying, alcohol-insoluble substances, reaction, free alkali and free acids, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Sulfate (Glauber's Salt). Description, solubility, identification, loss on drying, reaction, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sodium Thiosulfate (Sodium Hyposulfite). Description, solubility, identification, loss on drying, reaction, arsenic, calcium, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution Sodium Hypochlorite. Description, identification, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfobromophthalein Sodium. Description, solubility, identification, loss on drying, sensitiveness, color and completeness of solution, halide ion, sulfate, arsenic, and storage. U.S.P. product of sulfobromophthalein sodium—Injectio Sulfobromophthaleini Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfobromophthalein Sodium Injection (Sulfobromophthalein Sodium Ampuls). Identification, sensitiveness, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theobromine and Sodium Acetate. Description, solubility, identification, reaction, alkalinity, color and completeness of solution, caffeine, assay, and storage. U.S.P. product of theobromine and sodium acetate—Capsulae Theobrominae et Sodii Acetatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theobromine and Sodium Acetate Capsules. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline and Sodium Acetate (Theophylline with Sodium Acetate). Description, solubility, identification, reaction, limit of caffeine, assay, and storage. U.S.P. Product of theophylline and sodium acetate—Tabellae Theophyllinae et Sodii Acetatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Theophylline and Sodium Acetate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tryparsamide. Description, solubility, identification, distinction from sodium cacodylate, loss on drying, reaction, arsenate, arsanilic acid, arsphenamine compounds, assay, storage, and labeling.

U. S. Gov., Army Air Forces. Specification 14078-A; 1941. Dibasic Sodium Phosphate; Technical.

U. S. Gov., Army Air Forces. Specification 14126-1; 1945. Compound; Plater's Electrocleaning.

U. S. Gov., Army Air Forces. Specification No. 14134; 1945. Sodium Thiosulphate; Anhydrous (Photographic Hypo).

U. S. Gov., Army Air Forces. Specification 40337 (1); 1942. Salt, for Regeneration of Zeolite Water Softeners.

U. S. Gov., Army Air Forces. Specification, 40616-A (2); 1944. Packet; Fluorescein Dye, Sea Marker.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C381; 1930. Sodium Oxalate as a Standard in Volumetric Analysis. Describes the preparation of sodium oxalate as a primary volumetric standard; tests for impurities, stability; recommended procedure for use in oxidimetry.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Sodium Oxalate, Sample 40d. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Specification 0-S-595; 1944. Sodium-Dichromate; Technical Grade. Covers one type and one grade in crystalline form, intended for general use. Gives requirements for volatile matter, sodium-dichromate, water-insoluble matter, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification 0-S-601; 1930. Amendment 1; 1938. Sodium-Fluoride (Insecticide). Covers one grade. Gives detail requirements; method of sampling, inspection, and test; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-0-S-601; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) deletes requirements for metal cans.

U. S. Gov., Federal Specifications 0-S-606; 1930. Sodium-Sulphite; Anhydrous (for) Photography. Covers one grade. Gives detail requirements; method of inspection, sampling, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification 0-S-616; 1941. Admendment 1; 1942. Sodium-Thiosulfate (Hyposulfite), Technical. Covers two grades—(A) granular and (B) pea crystals. Gives requirements for size and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification 0-T-671a; 1940. Trisodium-Phosphate; Technical (Phosphate Cleaner). Covers one grade. Gives detail requirements; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51C29a; 1943. Chemicals; Testing, Dissolved-Oxygen.

U. S. Gov., Navy Dept. Specification 51C37; 1943. Compound; Soot-Remover.

U. S. Gov., Navy Dept. Specification 51 C 38; 1944. Chemicals; Fire-Retardant, for Lumber and Timber.

U. S. Gov., Navy Dept. Specification 51D12; 1944. Disodium-Phosphate; Anhydrous.

U. S. Gov., Navy Dept. Specification 51 S 36; 1943. Sodium-Chromate; Technical Corrosion Inhibiting.

U. S. Gov., Treasury Dept., Procurement Div., No. 646; 1944. Sodium Citrate; Technical Grade. Covers one type and one grade in crystalline form intended for use in lithographic operations. Not intended for edible or medicinal uses. Gives requirements for sodium citrate content, volatile matter at 150° C., tartrate content, water insoluble material, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 648; 1944. Sodium Chloride (for Photographic Purposes). Covers one type and one grade, in the form of white granules, suitable for photographic purposes. Gives requirements for moisture, chloride content, ammonium hydroxide precipitate, bromides and iodides, water insoluble material, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 653; 1944. Sodium Sulphate; Anhydrous (for Photographic Purposes). Covers one type and one grade in granular form. Gives requirements for solubility, loss on ignition, neutrality, heavy metals, iron, hologens; and calcium, magnesium, and ammonium hydroxide precipitate; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 654; 1944. Sodium Sulfide (for Photographic Purposes). Covers one type and one grade in flake form. Gives requirements for volatile matter, sodium sulfide. iron, and solubility; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 659; 1944. Sodium Bisulfite (for Photographic Purposes). Covers one type and one grade in powdered form intended for photographic purposes. Gives requirements for sodium bisulfite content, sulfates, heavy metals, iron, calcium and magnesium, solubility, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 694; 1944. Sodium Phosphates; Glassy (for Water Treatment Purposes). Covers one grade and two types: (I) 64 percent P_2O_5—Class A, granules or flakes and class B, beads or plates; and (II) 67 percent P_2O_5. Gives requirements for phosphate content, loss on heating, water-insoluble material, hydrogen-ion concentration, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 698; 1944. Sodium Metaborate; Hydrated (for Photographic Purposes). Covers one type and grade in crystalline form. Gives requirements for loss in heating, sodium metaborate content, carbonates and bicarbonates, heavy metals, iron, bromides and iodides, water insoluble matter, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 706; 1944. Sodium Oxalate; Technical Grade. Covers one type and grade in the form of white powder. Gives requirements for sodium oxalate content and acidity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 717; 1945. Sodium Bisulfate, for Photographic Purposes. Covers one type and one grade of colorless crystals. Gives requirements for total acidity, water insoluble matter, heavy metals, and iron content; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 4-1050; 1936. Sodium Metaphosphate.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-280; 1943. Powder; Tropic, for Photographic Developers.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-285; 1943. Powder; Hardening, Stop Bath, for Photographic Use.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-286; 1943. Sodium Thiosulphate (for Photographic Use).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-287; 1943. Powder; Hardener, Predeveloping, for Photographic Use.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-300; 1943. Powder; Hardener, Fixing Bath, for Photographic Use.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-336A; 1933. Sodium Acetate; Anhydrous.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-370A; 1938. Sodium Thiosulfate (Technical).

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1067; 1937. Sodium Phosphate; Dibasic, Anhydrous, Reagent Grade.

U. S. Gov., U. S. Army, Medical Dept. Specification 5-1123; 1944. Sodium Sulamyd; Packaged.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-95; 1940. Sodium Oxalate.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 4-2; 1919. Sodium Hyposulfite.

References.—Table salt and dairy salt, *see* 154.6; bisulphite bleach, *see* 891; unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810; test for arsenic in sodium cacodylate, *see* 814.2.

835. BARIUM COMPOUNDS

835.1 BARIUM CARBONATE

American Chemical Society. Specifications for Analytical Reagents, 1941. Barium Carbonate. Gives requirements for matter insoluble in hydrochloric acid, chloride, hydroxide and alkali carbonate, nitrate, sulfide, calcium and alkali salts, strontium and calcium salts, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Barium Carbonate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

References.—Unit weights, *see* 830.

835.2 BARIUM CHLORIDE

American Chemical Society. Specifications for Analytical Reagents, 1941. Barium Chloride. Gives requirements for insoluble matter, nitrate and chlorate, alkali salts, strontium and calcium chlorides, heavy metals, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Barium Chlorid. Chemical symbol, synonyms, description, and preparations for triturations, tincture, dilutions, and medications for use in homeopathic medicines.

References.—Unit weights, *see* 830.

835.3 BARIUM DIOXIDE

835.4 BARIUM HYDROXIDE

American Chemical Society. Specifications for Analytical Reagents, 1941. Barium Hydroxide. Gives requirements for assay and carbonate, insoluble in hydrochloric acid, chloride, sulfide, calcium and alkali salts, heavy metals, iron, and tests.

References.—Unit weights, *see* 830.

835.5 BARIUM NITRATE

American Chemical Society. Specifications for Analytical Reagents, 1941. Barium Nitrate. Gives requirements for insoluble matter, chloride, calcium and alkali salts, calcium and strontium salts, heavy metals, iron, and tests.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-20B; 1942. Barium Nitrate.

References.—Unit weights, *see* 830.

835.6 BARIUM SULPHIDE

835.7 BARIUM IODIDE

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Barium Iodid. Chemical symbol, synonyms, description, and preparations for triturations, tincture, dilutions, and medications for use in homoeopathic medicines.

835.8 BARIUM ACETATE

American Chemical Society. Specifications for Analytical Reagents, 1941. Barium Acetate. Gives requirements for insoluble matter, chloride, nitrate, alkali salts, calcium and strontium salts, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Barium Acetate. Chemical symbol, synonyms, description, and preparations for solutions, dilutions, medications, and triturations for use in homoeopathic medicines.

835.9 MISCELLANEOUS BARIUM COMPOUNDS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Blanc Fixe (Barium Sulphate). Covers definition, constants, solubility, derivation, uses, grades and forms, containers, shipping, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Barium Sulfate. Description, solubility, bulkiness, identification, sulfide, acid-soluble substances, soluble barium salts, free acid or alkali, phosphate, arsenic, heavy metals, and storage.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-57; 1931. Barium Chlorate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-68A; 1942. Barium Peroxide.

References.—Barium sulphate paint pigments, *see* 842.86, 842.87; Food and Drugs Act and Regulations, *see* 810.

836. BISMUTH COMPOUNDS

836.1 BISMUTH CHLORIDE

836.2 BISMUTH NITRATE

836.3 BISMUTH SUBNITRATE

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Bismuth Sub-nitrate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Tablets of Bismuth Subnitrate. Gives chemical composition, identifications, ammonium compounds, assay, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth Subnitrate (Basic Bismuth Nitrate). Description, solubility, identification, reaction, loss on drying, carbonate, chloride, ammonia, alkalies and earths, arsenic, lead, copper, sulfate, silver, assay, and storage.

References.—Food and Drugs Act and Regulations, *see* 810.

836.4 BISMUTH TARTRATE

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth and Potassium Tartrate. Description, solubility, identification, alcohol-soluble extractive, arsenic, lead, assay, and storage. U.S.P. product of bismuth and potassium tartrate—Injectio Bismuthi et Potassii Tartartis.

836.9 MISCELLANEOUS BISMUTH COMPOUNDS

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Bismuthous Oxid. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Bismuth Subgallate (Basic Bismuth Gallate or Dermatol). Gives chemical composition, description, solubility, identifications, nitrate; alkalies and earths; arsenic; lead, copper, or silver; free gallic acid, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Bismuth. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin and Bismuth. Gives chemical composition, storage, alcohol content, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Pepsin, Bismuth, and Strychnine. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Bismuth. Gives chemical composition, description, specific gravity, assay, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Magma of Bismuth (Milk or Cream of Bismuth). Gives chemical composition, description, miscibility, identifications, soluble salts, alkalies and earths, arsenic, lead, assay, storage, average dose, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Paste of Bismuth (Beck's Bismuth Paste). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Bismuth Subcarbonate. Gives chemical composition, identification, alkaline earths, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Bismuth Subgallate. Gives chemical composition, identifications, alkaline earths, assay, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth and Potassium Tartrate Injection (Bismuth and Potassium Tartrate Ampuls). Aqueous solution, identification, and assay. Oil suspension, identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth Subcarbonate (Basic Bismuth Carbonate). Description, solubility, identification, loss on drying, alkalies and earths, chloride, nitrate, sulfate, lead, silver, arsenic, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth Subsalicylate (Basic Bismuth Salicylate). Description, solubility, identification, loss on drying, alkalies and earths, nitrate, other tests, free salicylic acid, arsenic, assay, and storage. U.S.P. product of bismuth subsalicylate—Injectio Bismuthi Subsalicylatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Bismuth Subsalicylate Injection (Bismuth Subsalicylate Ampuls). Identification, assay, storage, and sizes.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

837. CHROMIUM AND MOLYBDENUM COMPOUNDS

837.0 GENERAL ITEMS

837.1 CHROMIUM POTASSIUM SULPHATE

American Chemical Society. Specifications for Analytical Reagents, 1941. Chromium and Potassium Sulfate. Gives requirements for insoluble matter, chloride, aluminum, ammonia, heavy metals, iron, and tests.

U. S. Gov., Treasury Dept., Procurement Div., No. 688; 1944. Chromium-Potassium Sulfate (Chrome Alum), for Photographic Purposes. Covers one type and one grade in the form of dark violet-red particles. Gives requirements for aluminum content, iron content, heavy metals content, water-insoluble matter, loss on heating, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

837.2 CHROMIUM TRIOXIDE

American Chemical Society. Specifications for Analytical Reagents, 1941. Chromium Trioxide. Gives requirements for assay, insoluble matter chloride, sulfate, alkali salts, iron, aluminum, barium, etc., and tests.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Chromium Trioxide. Description, solubility, identification, alkali salts, sulfate, assay, and storage.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810.

837.3 MOLYBDIC OXIDE

837.9 MISCELLANEOUS CHROMIUM AND MOLYBDENUM COMPOUNDS

American Society for Testing Materials, A 146-39; 1939. Molybdenum Salts and Compounds. Covers the standard grades of material, chemical composition requirements, sampling, and inspection.

American Standards Assn., Z 37.7-1943. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Chromic Acid and Chromates. To prescribe the maximum permissible concentration of chromic acid mist or dust from chromates or dichromates of the alkali or alkaline earth metals in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Gives properties of chromic acid and soluble chromates, permissible concentration, sampling procedure, and analytical methods.

References.—Unit weights, *see* 830.

838. ALUMINUM COMPOUNDS

838.1 ALUMINUM HYDROXIDE (REFINED BAUXITE)

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Aluminum Hydrate and Metallic Aluminum. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Aluminum Hydrate. Covers definition, specifications, solubility, derivation, uses, and containers.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aluminum Hydroxide Gel (Collodial Aluminum Hydroxide). Description, identification, reaction, acid-consuming capacity, chloride, sulfate, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Dried Aluminum Hydroxide Gel. Description, solubility, identification, reaction, acid-consuming capacity, chloride, sulfate, assay, and storage. U.S.P. product of dried aluminum hydroxide gel—Gelatum Alumini Hydroxidi.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Bauxite, Sample 69. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

838.2 ALUMINUM POTASSIUM SULPHATE (ALUM)

American Chemical Society. Specifications for Analytical Reagents, 1941. Aluminum and Potassium Sulfate. Gives requirements for insoluble matter, chloride, ammonia, arsenic, heavy metals, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Alum. Chemical symbol, synonyms, description, and preparations for trituration and solution for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Alum, 1942. Gives requirements for insoluble matter, total soluble alumina, total iron, ferric iron, ferrous iron, sulfur trioxide, basic alumina, combined alumina, and total alumina.

Technical Assn. of the Pulp and Paper Industry. Analysis of Alum. Standard T 614 m-44; 1944. For papermakers grade of commercial and iron-free alum. Covers sampling; complete galvimetric analysis including insoluble matter, total soluble alumina, total iron, ferric iron, ferrous iron, foreign sulphates, sulphur trioxide, and final calculations; and routine analysis including insoluble matter, basic alumina, combined alumina, total alumina, and total iron and ferric iron.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Alum (Ammonium Alum, Potassium Alum). Description, solubility, identification, reaction, alkalies and earths, arsenic, heavy metals, iron, assay, and storage. U.S.P. product of alum—Alumen Exsiccatum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Exsiccated Alum (Dried Alum, Burnt Alum). Description, solubility, identification, loss on drying, residue insoluble in water, alkalies and earths, arsenic, heavy metals, iron, assay, and storage.

U. S. Gov., Federal Specification O-A-421; 1935. Aluminum-Potassium-Sulfate (Potash-Alum), (for) Photographic Purposes. Covers one grade in two types—(A) crystals and (B) powder. Gives requirements for solubility, litmus paper test, sulfate, heavy metals; iron, sodium and potassium, and ammonia; methods of sampling, inspecting, and testing; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-96; 1921. Alum; Powdered.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1061; 1937. Aluminum and Potassium Sulfate; Reagent Grade.

References.—Food and Drugs Act and Regulations, *see* 810.

838.3 ALUMINUM SULPHATE

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aluminum Sulfate. Gives chemical composition, description, solubility, identification, loss on drying, reaction, free acid, alkalies and earths, ammonium salts, arsenic, heavy metals, iron, assay, storage, and preparations.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Sulphate of Alumina To Be Used in Water Treatment. Gives requirements for chemical properties, physical properties, and tests; packing and marking; and inspection and rejection.

American Water Works Assn. Emergency Alternate Specifications for Sulfate of Alumina, 1942. Covers chemical requirements, size of lumps or grains, packing and shipment, and sampling and testing. The A.W.W.A. standard specifications for sulfate of alumina will not apply until the war emergency is over.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Aluminum Sulphate. Covers definition, constants, derivation, grades, impurities, uses, containers, and specifications for paper trade.

U. S. Gov., Treasury Dept., Procurement Div., No. 704; 1944. Aluminum Sulfate (Sulfate of Alumina), for Water and Sewage Treatment Purposes. Covers one type and one grade in granular form. Gives requirements for water insoluble matter, aluminum oxide content, iron oxide content, free acid, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Food and Drugs Act and Regulations, *see* 810.

838.4 ALUMINUM AMMONIUM SULPHATE

838.5 ALUMINUM CHLORIDE

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Aluminum Chloride. Gives chemical composition, description, solubility, identification, reaction, sulfate, alkalies and earths, arsenic, heavy metals, iron, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Aluminum Chloride. Gives chemical composition, description, specific gravity, identification, assay, storage, and external use.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Aluminum Chloride (Chloride of Alumina). Covers definition, constants, solubility, derivation, uses, grades, and containers.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-20A; 1940. Aluminum Chloride; Anhydrous.

References.—Food and Drugs Act and Regulations, *see* 810.

838.6 ALUMINUM OXIDE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Alumina; Activated. Covers definition, constants, solubility, derivation, grades, purity, uses, and containers.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Aluminum Oxide. Covers definition, constants, purity, derivation, uses, and containers.

References.—Aluminum oxide abrasives, *see* 541.0, 541.3, 541.4.

838.7 ALUMINUM FLUORIDE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Aluminum Fluoride. Covers description, constants, purity, solubility, derivation, uses, and containers.

838.9 MISCELLANEOUS ALUMINUM COMPOUNDS

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Kaolin. Gives chemical composition, description, solubility, identification, loss on ignition, acid-soluble substances, carbonate, iron, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Aluminum Acetate (Burow's Solution). Gives chemical compositions, preparation for each composition, description, specific gravity, identification, hydrogen-ion concentration, lead, limit for boric acid, assay for aluminum oxide and for acetic acid, storage, and average dilution for external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Aluminum Subacetate. Gives chemical composition, description, identification, reaction, limit for boric acid, assay for aluminum oxide and for acetic acid, storage, average dilution for external use, and preparation.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Aluminum Monohydrate. Covers definition, specifications, solubility, derivation, uses, thermal conductivity, and containers.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Kyanite. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

U. S. Gov., Navy Dept. Specification 51A11; 1935. Aluminum Stearate.

References.—Aluminum bronze paint and powder, *see* 847.1.

839. CHEMICALS AND CHEMICAL COMPOUNDS NOT ELSEWHERE CLASSIFIED

839.0 GENERAL ITEMS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1940. Standard Samples. Arsenic Trioxide, Sample 83.

839.1 ACETONE

American Chemical Society. Specifications for Analytical Reagents, 1941. Acetone. Gives requirements for assay, boiling range, nonvolatile matter, solubility in water, acids, alkaline substances, aldehyde, substances reducing permanganate, and tests.

American Hospital Assn., 16-1. Acetone. Covers two grades. Based on U. S. Gov. Federal Specification O-A-51a.

American Society for Testing Materials, D 329-33; 1933. Acetone. Requirements for purity, specific gravity, color, distillation range, nonvolatile matter, water, acidity, water solubility, alkalinity, potassium permanganate test, in accordance with A.S.T.M. Method D 268 for testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Acetone. Covers definition, constants, solubility, derivation, uses, grades, containers, hazards, shipping regulations, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Acetone. Description, solubility, specific gravity, boiling point, identification, nonvolatile residue, reaction, readily oxidizable substances, assay, and storage.

U. S. Gov., Federal Specification O-A-51a; 1933. Amendment 2; 1939. Acetone. Covers two grades—A and B. Gives detail requirements for each grade; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-32A; 1938. Acetone; Dimethylketone, for Use in the Manufacture of Smokeless Powder.

Reference.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810; testing of lacquer solvents and diluents, *see* 822.0.

839.2 AMYL ACETATE

American Society for Testing Materials, D 318-39; 1939. Amyl Acetate (Synthetic) (85 to 88 Percent Grade). Gives limiting values for specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and ester value, with requirements for tests in accordance with A. S. T. M. Method D 268.

American Society for Testing Materials, D 554-39; 1939. Amyl Acetate Made From Fusel Oil (85 to 88 Percent Grade). Covers allowable range for specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and ester value, with tests using A. S. T. M. Method D 268.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Amyl Acetate (Banana Oil; Isoamyl Acetate). Covers definition, constants, solubility, acidity, derivation, uses, grades, containers, hazards, shipping regulations, and substitutes.

References.— Methods of testing lacquer solvents and diluents, *see* 822.0.

839.3 COMPOUNDS, MIXTURES, AND SALTS OF METALS

839.30 General Items

American Wood-Preservers' Assn., 1d; 1944. Standard Methods of Analysis for Salt Preservatives. Gives general requirements for all classes of salts and determination of the following: insoluble material in zinc chloride, iron and aluminum in zinc chloride, chlorine in zinc chloride and chromated zinc chloride, zinc in zinc chloride, zinc in zinc meta arsenite, zinc in chromated zinc chloride, hexavalent chromium in Tanalith and chromated zinc chloride, total arsenic in Tanalith, trivalent arsenic in zinc meta arsenite, excess acetic acid in zinc meta arsenite, dinitrophenol in Tanalith, and sodium fluoride in Tanalith.

839.31 Antimony Compounds and Salts

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Antimonious Arsenate, Antimonious Iodid, Antimonious Oxid, Antimonious Sulfid, Antimonious Sulfid (Yellow), Calcium Hypophosphite, and Potassium Antimonyl Tartrate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Antimony (Tincture of Tartar Emetic). Gives chemical composition, preparation, alcohol content, and average dose.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Antimony and Potassium Tartrate. Description, solubility, identification, reaction, arsenic, iron, assay, and storage.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-14C; 1943. Antimony Sulphide.

References.—Food and Drugs Act and Regulations, *see* 810.

839.32 Cobalt Compounds and Salts

American Chemical Society. Specifications for Analytical Reagents, 1941. Cobalt Nitrate (Not Low in Nickel). Gives requirements for insoluble matter, chloride, sulfate, alkalies and earths, copper, iron, nickel, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Metallic Cobalt. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Cobalt Oxide. Covers definition, constants, solubility, derivation, impurities, other forms, range analysis, substitutes, containers, and uses.

References.— Unit weights, *see* 830.

839.33 Copper Compounds and Salts

American Chemical Society. Specifications for Analytical Reagents, 1941. Cupric Acetate; Normal. Gives requirements for insoluble matter, chloride, sulfate, alkali salts, iron, ammonium sulfide metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Cupric Ammonium Chloride. Gives requirements for insoluble matter, free acid, nitrate, sulfate, substances not precipitated by hydrogen sulfide, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Cupric Nitrate. Gives requirements for insoluble matter, chloride, sulfate, alkali salts, iron, ammonium sulfide metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Cupric Oxide; Powdered. Gives requirements for insoluble in acid, carbon compounds, chloride, nitrogen, sulfate, free alkali, substances not precipitated by hydrogen sulfide, ammonium hydroxide precipitate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Cupric Oxide—Wire Form. Gives requirements for carbon compounds, nitrogen, sulfur compounds, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Cupric Sulfate. Gives requirements for insoluble matter, chloride, substances not precipitated by hydrogen sulfide, ammonium hydroxide precipitate, ammonium sulfide metals other than iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Cuprous Chloride. Gives requirements for assay, insoluble in acid, sulfate, arsenic, substances not precipitated by hydrogen sulfide, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Cupric Acetate, Cupric Carbonate, Cupric Sulphate, Hydric Cupric Arsenite, and Metallic Copper. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Copper Carbonate. Official method for determination of copper oxide.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Cupric Sulfate (Copper Sulfate). Description, solubility, identification, reaction, alkali and alkaline earths, assay, and storage.

U. S. Gov., Treasury Dept., Procurement Div., No.610; 1943. Cupric Sulfate; Technical Grade, Crystals. Covers one type and one grade intended for use in electroplating and batteries. Gives requirements for material, cupric sulfate content, insoluble matter, iron compounds, and particle size; sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-22A; 1938. Copper Sulfocyanate, for Use in Primer Composition.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-104; 1941. Oxide; Cupric.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810; testing canned foods for copper, *see* 120; copper base paint pigments, *see* 842.9; copper carbonate fungicide, *see* 881.9.

839.34 Iron Compounds and Salts

American Chemical Society. Specifications for Analytical Reagents, 1941. Ferric Ammonium Sulfate. Gives requirements for appearance, insoluble matter, chloride, copper, ferrous iron, material not precipitated by ammonium hydroxide, zinc, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Ferric Chloride. Gives requirements for insoluble matter, nitrate, phosphorus compounds, sulfate, arsenic, copper, ferrous iron, substances not precipitated by ammonium hydroxide, zinc, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Ferric Nitrate. Gives requirements for insoluble matter, chloride, sulfate, substances not precipitated by ammonium hydroxide, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Ferrous Ammonium Sulfate. Gives requirements for insoluble matter, phosphate, copper, ferric iron, manganese, material not precipitated by ammonium hydroxide, zinc, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Ferric Acetate, Ferric Chlorid, Ferro-Ferric Oxid, Ferroso-Ferric Phosphate, Ferrous Arsenate, Ferrous Bromid, Ferrous Carbonate, Ferrous Iodid, Ferrous Lactate, Ferrous Sulfate, and Iron by Hydrogen. Chemical symbol, synonyms, description, and preparations for triturations, tincture, solutions, and dilutions for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Green Iron and Ammonium Citrates. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Beef and Iron. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Gentian and Iron. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Iron, Quinine, and Strychnine. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Elixir of Iron, Quinine, and Strychnine Phosphates. Gives chemical composition, preparation, storage, alcohol content, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ferric Glycerophosphate. Gives chemical composition, description, solubility, identification, loss on drying, reaction, chloride and sulfate, phosphate, arsenic, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ferric Hypophosphite. Gives chemical composition, description, solubility, identification, loss on drying, carbonate and calcium, phosphate, sulfate, arsenic, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Gargle of Potassium Chlorate With Iron (Golden Gargle). Gives chemical composition, storage, alcohol content, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Iron. Gives form, identification, arsenic, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Peptonized Iron. Gives description, solubility, identification, reaction, ionic iron, sugar, assay, storage, preparations, average dose, and chemical composition.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Pills of Ferrous Iodide. Gives chemical composition, preparation, tests for purity, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Pills of Iron, Quinine, Strychnine and Arsenic (Aitken's Pills). Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Red Ferric Oxide. Gives chemical composition, description, solubility, particle size, loss on ignition, water-soluble substances and acid-insoluble substances, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Saccharated Ferric Oxide (Ferrum Oxydatum Saccharatum or Eisenzucker). Gives chemical composition, ionic iron, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Saccharated Ferrous Carbonate. Gives chemical composition, description, solubility, identifications, sulfate, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Soluble Ferric Phosphate. Gives description, solubility, identifications, reaction, ammonium salts, assay, storage, preparation, average dose, and chemical composition.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Soluble Ferric Pyrophosphate. Gives description, solubility, identifications, reaction, phosphate, ammonium salts, arsenic, assay, storage, average dose, and chemical composition.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ferric Chloride (Solution of Iron Perchloride). Gives chemical composition, description, miscibility, specific gravity, identification, alkali and alkaline earth salts, nitrate, ferrous salts, zinc or copper, assay for hydrochloric acid and for iron, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ferric Subsulfate (Solution of Basic Ferric Sulfate). Gives chemical composition, description, miscibility, specific gravity, identification, reaction, nitrate, ferrous salts, assay, storage, average dose, external use as a styptic, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Ferric Sulfate (Solution of Iron Tersulfate). Gives chemical composition, description, miscibility, specific gravity, identification, nitrate, ferrous iron, assay, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Iron and Ammonium Acetate (Basham's Mixture). Gives chemical composition, description, identifications, reaction, assay for ammonia and for iron, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Peptonized Iron. Gives chemical composition, description, specific gravity, identifications, assay, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Peptonized Iron and Manganese. Gives chemical composition, description, specific gravity, identifications, assay for iron, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Syrup of Ferrous Iodide. Gives chemical composition, description, specific gravity, identification, free iodine, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Ferric Chloride (Tincture of Iron). Gives chemical composition, description, specific gravity, identifications, nitrate, assay, alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tincture of Ferric Citrochloride. Gives chemical composition, assay, alcohol content, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Yellow Ferric Oxide. Gives description, solubility, particle size, loss on ignition, water-soluble substances, acid-insoluble substances, assay, storage, preparation, and chemical composition.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Sulphate of Iron To Be Used in Water Treatment. Covers granular sugar sulphate of iron. Gives requirements for chemical properties and tests, packing and marking, and inspection and rejection.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Exsiccated Ferrous Sulfate (Dried Ferrous Sulfate). Description, solubility, identification, insoluble matter, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ferrous Sulfate (Iron Sulfate). Description, solubility, identification, reaction, free acid, copper and lead, assay, and storage. U.S.P. products of ferrous sulfate—Ferri Sulfas Exsiccatus, Tabellae Ferri Sulfatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ferrous Sulfate Tablets. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Green Iron and Ammonium Citrates. Description, solubility, identification, reaction, other tests, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iron and Ammonium Citrates. Description, solubility, identification, reaction, tartrate, ferric citrate, assay, and storage. U.S.P. product of iron and ammonium citrates—Capsulae Ferri et Ammonii Citratum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Iron and Ammonium Citrates Capsules. Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mass of Ferrous Carbonate (Vallet's Mass). Preparation, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pills of Ferrous Carbonate (Chalybeate Pills, Blaud's Pills, Ferruginous Pills). Preparation, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Reduced Iron (Iron of Hydrogen). Description, identification, insoluble in diluted sulfuric acid, reaction, sulfide, arsenic, lead, assay, and storage.

U. S. Gov., Treasury Dept., Procurement Div., No. 647; 1944. Ferric Ammonium Oxalate; Technical Grade. Covers one type and one grade of green granules intended for use in the sensitizing of blue print paper. Gives requirements for ferric ammonium oxalate content, water insoluble matter, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 665; 1944. Ferrous Sulfate (for Photographic Purposes). Covers one type and one grade of bluish-green crystals or granules for wet plate photography. Gives requirements for water insoluble matter, ferrous sulfate, ferric iron, copper and zinc, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 695; 1944. Ferric Ammonium Citrate (Green); Technical Grade. Covers one type and one grade in the form of yellowish-green granules or scales. Gives requirements for iron content, water soluble matter, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-190A; 1938. Ferrous Sulfide.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-206; 1926. Hammer Scale (Magnetic Oxide of Iron).

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810; iron oxide pigments for paints, *see* 841.4; ammonium sulphate, *see* 831.7.

839.35 Lead Compounds and Salts

American Chemical Society. Specifications for Analytical Reagents, 1941. Lead Acetate. Gives requirements for insoluble matter, chloride, nitrate, copper, iron, substances not precipitated by hydrogen sulfide, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Lead Carbonate. Gives requirements for insoluble in acetic acid, chloride, nitrate, alkalies and alkaline earths, iron, zinc, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Lead Chromate. Gives requirements for assay, soluble matter, carbon compounds, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Lead Dioxide. Gives requirements for assay, acid-insoluble matter, carbonate, chloride, nitrate, sulfate, manganese, other hydrogen sulfide metals, substances not precipitated by hydrogen sulfide, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Lead Nitrate. Gives requirements for insoluble matter, chloride, copper, iron, substances not precipitated by hydrogen sulfide, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Lead Subacetate. Gives requirements for assay of lead, insoluble in acetic acid, chloride, nitrate, substances not precipitated by hydrogen sulfide, copper, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Metallic Lead, Plumbic Acetate, Plumbic Carbonate, Plumbic Chromate, and Plumbic Iodid. Chemical symbol, synonyms, description, and preparations for triturations, solution, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cerate of Lead Subacetate. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Diluted Solution of Lead Subacetate (Lead Water). Gives chemical composition, description, identifications, reaction, copper or iron, assay, storage, and external use.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lead Monoxide. Gives chemical composition, description, solubility, identification, loss on ignition, acetic acid-insoluble substances, alkaline earths, assay, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Lead Oleate. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Plaster of Lead Oleate (Lead Plaster or Diachylon Plaster). Gives chemical composition, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Lead Subacetate (Goulard's Extract). Gives chemical composition, description, specific gravity, identifications, reaction, alkaline earths, copper or iron, assay, storage, preparations, and average dilution for external use.

American Standards Assn., Z 37.11-1943. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Lead and Certain of Its Inorganic Compounds. To prescribe the permissible concentration of metallic lead, lead carbonate, lead sulfate, lead oxides, lead nitrate, and lead chloride in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Gives toxic properties of lead, permissible concentration, sampling procedure, and analytical methods.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 2, Part 6; 1938. Determination of Lead in the Air. Covers collection of dust sample from the air, analysis of sample, typical example, and microscopic detection of lead.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Basic Lead Carbonate; Dry and Paste (White Lead, *see* Basic Lead Sulphate). Covers definition, constants, solubility, grades, substitutes, containers, uses, and ordering instructions; also constants, derivation, grades, containers, uses, and ordering instructions for paste.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Basic Lead Sulphate; Dry and Paste (White Lead; Sublimed White Lead, *see* Basic Lead Carbonate). Covers definition, constants, solubility, common form, occurrence, derivation, containers, uses, and ordering instructions.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Lead Acetate (Sugar of Lead). Covers definition, constants, solubility, derivation, uses, grades, containers, hazards, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Litharge. Covers definition, constants, derivation, grades, specifications, substitutes, containers, and uses.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Lead Acetate (Sugar of Lead). Description, solubility, identification, reaction, carbonate, alkali or earths, iron or copper, assay, and storage.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-13A; 1938. Lead Sulfocyanate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-28A; 1938. Lead Oxide; Litharge, for Primer Composition.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810; lead arsenate, insecticide, *see* 881.11; lead pigments for paints, *see* 842.6.

839.36 Mercury Compounds and Salts

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Cinnabar, Hahnemann's Soluble Mercury, Mercur-Ammonium Chlorid, Mercuric Chlorid, Mercuric Cyanid, Mercuric Iodid, Mercuric Nitrate, Mercuric Oxid, Mercuric Sulfate, Mercurous Chlorid, Mercurous Iodid, Mercury, and Potassium Mercuric Iodid. Chemical symbol, synonyms, description, and preparations for tincture, dilutions, medications, and triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Mercuric Succinimide. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Pills of Mild Mercurous Chloride (Compound Cathartic Pills). Gives chemical composition, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Mass of Mercury (Blue Mass or Blue Pill). Gives chemical composition, assay, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Merbromin. Gives chemical composition, description, solubility, identifications, loss on drying, bromine ions and mercury ions, assay for bromine and for mercury, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Mercuric Nitrate (Citrine Ointment). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Mild Mercurous Chloride (Calomel Ointment). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Red Mercuric Oxide. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Red Mercuric Iodide. Gives chemical composition, description, solubility, identifications, loss on drying, residue, residue insoluble in potassium iodide solution, soluble mercury salts, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Red Mercuric Oxide (Red Precipitate). Gives chemical composition, description, solubility, identification, loss on drying, residue, nitrate, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Arsenic and Mercuric Iodides (Donovan's Solution). Gives chemical composition, description, identifications, assay for arsenic triiodide and for mercuric iodide, storage, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Solution of Merbromin. Gives chemical composition, description, identifications, bromine ions, mercury ions; assay for merbromin, for bromine, and for mercury; and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Surgical Solution of Merbromin. Gives chemical composition, preparation, description, identification, distinction from solution of merbromin, bromine ions, mercury ions, assay for each, total solids, bromine and mercury, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Mild Mercurous Chloride (Calomel Tablets). Gives chemical composition, identifications, mercuric chloride, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Mild Mercurous Chloride and Sodium Bicarbonate (Calomel and Soda Tablets). Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Red Mercuric Iodide. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Tablets of Yellow Mercurous Iodide. Gives chemical composition, identifications, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Yellow Mercurous Iodide. Gives chemical composition, description, solubility, identifications, loss on drying, residue on ignition, mercuric iodide, assay, storage, preparation, and average dose.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Drugs. Mercuric Iodide in Tablets. Tentative method of determining the amount of mercuric iodide.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Mercurous Iodide. Tentative method for determining amount of mercurous iodide in tablets.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ammoniated Mercury (White Precipitate). Description, solubility, identification, residue on ignition, mercurous compounds, assay, and storage. U.S.P. product of ammoniated mercury—Unguentum Hydrargyri Ammoniati.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ammoniated Mercury Ointment (White Precipitate Ointment). Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Large Poison Tablets of Mercury Bichloride (Large Corrosive Sublimate Tablets, Large Bichloride Tablets). Regulations and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercuric Salicylate. Description, solubility, identification, residue on ignition, alkali-insoluble substances, foreign mercury compounds, assay, and storage. U.S.P. product of mercuric salicylate—Injectio Hydrargyri Salicylatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercuric Salicylate Injection (Mercuric Salicylate Ampuls). Identification, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercuric Succinimide. Description, solubility, identification, loss on drying, residue on ignition, reaction, chloride, mercury, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercurophylline Injection. Description, identification, mercury ions, assay of mercury, assay of theophylline, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercury Bichloride (Corrosive Mercuric Chloride, Corrosive Sublimate, Mercuric Chloride). Description, solubility, identification, loss on drying, residue on ignition, ether-insoluble residue, reaction, assay, and storage. U.S.P. products of mercury bichloride—Toxitabellae Hydrargyri Bichloridi Magnae, Toxitabellae Hydrargyri Bichloridi Parvae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mercury with Chalk (Gray Powder). Description, identification, mercurous oxide, mercuric oxide, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mersalyl. Description, solubility, identification, reaction, chloride, sulfate, mercury ions, readily oxidizable substances, assay for mercury, and storage. U.S.P. product of mersalyl—Injectio Mersalylis et Theophyllinae.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mersalyl and Theophylline Injection (Mersalyl and Theophylline Ampuls). Identification, reaction, mercuric ion, assay for mercury, assay for theophylline, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mild Mercurial Ointment (Diluted Mercurial Ointment, Blue Ointment). Preparation and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mild Mercurous Chloride (Mercurous Chloride, Calomel, Subchloride of Mercury). Description, solubility, identification, loss on drying, residue on ignition, ammonia, mercury bichloride, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oleate of Mercury. Description, solubility, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Small Poison Tablets of Mercury Bichloride (Small Corrosive Sublimate Tablets, Small Bichloride Tablets). Regulations and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strong Mercurial Ointment (Mercurial Ointment). Preparation and assay. U.S.P. product of strong mercurial ointment—Unguentum Hydrargyri Mite.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Yellow Mercuric Oxide (Yellow Precipitate). Description, solubility, identification, loss on drying, residue on ignition, acid-insoluble substances, alkali, distinction from red mercuric oxide, assay, and storage. U.S.P. product of yellow mercuric oxide—Unguentum Hydrargyri Oxidi Flavi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Yellow Mercuric Oxide Ointment. Preparation and assay.

U. S. Gov., Treasury Dept., Procurement Div., No. 683; 1944. Mercuric Chloride (for Photographic Purposes). Covers one type and one grade in the form of colorless crystals, white granules, or powder. Gives requirements for ether-insoluble matter and residue on heating; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-103; 1941. Calomel.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810; mercury base paint pigments, *see* 842.9; mercurial seed disinfectants, *see* 881.9.

839.37 Silver Compounds and Salts

American Chemical Society. Specifications for Analytical Reagents, 1941. Silver Nitrate. Gives requirements for insoluble matter, chloride, free acid, substances not precipitated by hydrochloric acid, sulfate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Silver Sulfate. Gives requirements for insoluble and chloride, nitrate, substances not precipitated by hydrochloric acid, iron, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Argentum Chlorid, Argentum Cyanid, Argentum Iodid, Argentum Nitrate, Argentum Oxid, Argentum Phosphate, and Metallic Silver. Chemical symbol, synonyms, description, and preparations for solution, dilutions, and triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ammoniacal Solution of Silver Nitrate. Gives chemical composition, description, specific gravity, identifications, reaction, copper, potassium and sodium, assay for silver and for ammonia, storage, oral use, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Mild Protein Silver. Description, solubility, identification, distinction from strong protein silver, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Silver Nitrate. Description, solubility, identification, clarity of solution and reaction, copper, assay, and storage. U.S.P. product of silver nitrate—Argenti Nitras Induratus.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Strong Protein Silver. Description, solubility, identification, distinction from mild protein silver, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Toughened Silver Nitrate. Description, solubility, reaction, other tests, assay, and storage.

U. S. Gov., Treasury Dept. Procurement Div., 701a; 1944. Silver Nitrate (for Wet Plate Photography). Covers one type and one grade in crystalline form. Gives requirements for silver nitrate content, acidity, insoluble matter, lead, copper, iron, chlorides, and bromides and iodides; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1102A; 1941. Silver Nitrate and Formalin, for Howe's Treatment.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810.

839.38 Zinc Compounds and Salts

American Chemical Society. Specifications for Analytical Reagents, 1941. Zinc Chloride. Gives requirements for assay, oxychloride, insoluble matter, nitrate, sulfate, ammonia, iron, lead, substances not precipitated by ammonium sulfide, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Zinc, Low in Arsenic. Gives requirements for arsenic, iron, insoluble in sulfuric acid, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Zinc, Low in Lead and Iron. Gives requirements for arsenic, iron, lead, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Zinc Oxide. Gives requirements for insoluble in sulfuric acid, alkalinity, chloride, nitrate, sulfur compounds, arsenic, iron, lead, manganese, substances not precipitated by ammonium sulfide, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Zinc Sulfate. Gives requirements for insoluble matter, free acid, chloride, nitrate, ammonia, arsenic, iron, manganese, substances not precipitated by ammonium sulfide, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Argentum Cyanid, Argentum Iodid, Argentum Chlorid, Argentum Oxid, Argentum Phosphate, Metallic Silver, Metallic Zinc, Zinc Acetate, Zinc Bromid, Zinc Carbonate, Zinc Chlorid, Zinc Cyanid, Zinc Iodid, Zinc Oxid, Zinc Phosphid, Zinc Sulfate, and Zinc Valerate. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Cement of Zinc Compounds and Eugenol. Gives chemical compositions of powder and liquid, preparations of the powder, liquid, and cement. The powder—gives description, identifications, assay for rosin and for total zinc as zinc oxide, and storage. The liquid—gives description, miscibility, specific gravity, index of refraction, identification, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh

Edition, 1942. Compound Powder of Zinc Sulfate. Gives chemical composition, test for antiseptic value, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Glycerite of Iodine and Zinc Iodide (Diluted Talbot's Solution). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Hard Paste of Zinc Oxide (Unna's Hard Zinc Paste). Gives chemical composition and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ointment of Zinc Stearate. Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Paste of Zinc Oxide. Gives chemical composition, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Paste of Zinc Oxide With Salicylic Acid. Gives chemical composition, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Prepared Calamine. Gives chemical composition, description, solubility, identification, loss on ignition, acid-insoluble substances, alkaline substances, calcium; calcium or magnesium, arsenic, lead, assay, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Prepared Neocalamine. Gives chemical composition, description, solubility, identification, loss on ignition, acid-insoluble substances, degree of fineness, alkalies, calcium, calcium or magnesium, arsenic, lead, assay, storage, and preparations.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Soft Paste of Zinc Oxide (Unna's Soft Zinc Paste). Gives chemical composition, preparation, and storage.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Zinc Iodide. Gives chemical composition, description, solubility, identifications, loss on drying, reaction, chloride, sulfate, alkalies and earths, arsenic, assay, storage, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Zinc Phenolsulfonate (Zinc Sulfocarbolate). Gives chemical composition, description, solubility, identifications, reaction, sulfate, arsenic, assay, storage, and average dose.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1926. Methods of Chemical Analysis of Zinc Chloride. Gives preparation and standardization of solutions, determination of insoluble or basic zinc chloride, determination of zinc, estimation of iron and alumina, determining the strength of zinc chloride solution, directions for the use of iodine potassium ferricyanide starch, color reaction test for determining zinc chloride penetration, and determination of zinc in treated timbers.

American Society for Testing Materials, D 199-27; 1927. Methods of Chemical Analysis of Zinc Chloride. For determination of insoluble basic zinc chloride, zinc chloride, and iron present in commercial concentrated solutions, or in fused, or granulated zinc chloride for use in the preservative treatment of wood. Solutions required, volumetric and gravimetric methods, and estimation of iron and aluminum. Conforms to American Railway Engineering Assn. methods of chemical analysis of zinc chloride.

American Society for Testing Materials, D 432-39; 1939. Zinc Chloride. For preservative treatment of timber by use of either commercial concentrated solutions or fused or granulated zinc chloride. Covers acid-free, minimum iron content, and chloride of zinc content requirements, and for tests using A.S.T.M. Method D 199.

American Wood-Preservers' Assn., 17a; 1921. Standard Specification for Zinc Chloride. Shall be acid-free zinc chloride. Gives requirements for iron content, fused or solid zinc chloride, and concentration.

American Wood-Preservers' Assn., 21a; 1922. Properties of Zinc Chloride Solutions at 60 Degrees Fahrenheit Based on Chemically-Pure Zinc Chloride. Gives tables showing percentage of zinc chloride in solutions of various specific gravities and degrees Baumé, weight of solutions, and pounds of zinc chloride per gallon for solutions expressed in percentage strengths.

American Wood-Preservers' Assn., 60b; 1944. Standard Specification for Chromated Zinc Chloride. Gives requirements for chromated zinc chloride in the dry form, chromated zinc chloride in concentrated solution or fresh working solution, and permissible change in composition for treating solution taken from working tanks or treating cylinder.

American Wood-Preservers' Assn., 62b; 1944. Standard Specification for Zinc Meta Arsenite. Shall be prepared at the treating plant under competent technical supervision. Gives requirements for chemical composition and proportion of ingredients and for preparation of solution.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet T-9. Table—Zinc Chloride Solution. Standard. Adopted, 1922. Embodies specific gravity, percentages, Baumé and Tw.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Zinc Oxide. Covers definition, constants, uses, properties, containers, specifications, and ordering instructions; also definition, properties, uses, purity, containers, and grades for leaded zinc oxide.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Zinc Sulphide. Covers definition, constants, derivation, uses, purity, forms available, and grades.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Zinc Stearate. Covers definition, constants, solubility, derivation, uses, grades, containers, and substitutes.

Society of Automotive Engineers. Aeronautical Material Specification 3111; 1943. Compound; Zinc Chromate (Slushing). Liquid for sealing minute leaks and as a protective coating in fuel tanks and for protecting synthetic rubber tanks. Composition (by weight), material, physical properties, requirements, tests, corrosion, containers, identification, approval, reports, and rejection. Similar to Army Air Forces Specification 3595.

Society of Automotive Engineers. Aeronautical Material Specification 3112; 1943. Compound; Zinc Chromate, Sealing (Unthinned), Hot-Oil Resisting. For sealing seams in high-pressure structures (including oil tanks). Composition (by weight), material, tests, corrosion, containers, identification, approval, reports, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 3113; 1943. Compound; Zinc Chromate, Sealing (Thinned), Hot-Oil Resisting. For sealing seams in high-pressure structures (including oil tanks). Composition (by weight), material, test, corrosion, containers, identification, approval, reports, and rejection.

Society of Automotive Engineers. Aeronautical Material Specification 3114; 1943. Compound; Zinc Chromate, Sealing (Unthinned), Aromatic Fuel-Resisting. For sealing seams in hull structures and in fuel tanks. Composition (by weight), material, tests, corrosion, containers, identification, approval, reports, and rejection. Similar to Army Air Forces Specification 3596, Condition A.

Society of Automotive Engineers. Aeronautical Material Specification 3115; 1943. Compound; Zinc Chromate, Sealing (Thinned), Aromatic Fuel-Resisting. For sealing seams in hull structures and in fuel tanks. Composition (by weight), material, tests, corrosion, containers, identification, approval, reports, and rejection.

Toilet Goods Assn. Inc. Specification No. 14; 1944. Zinc Oxide. Gives requirements for color, odor, identity, particle size, apparent density, loss on ignition, carbonates, alkalis, ZnO, arsenic, and lead.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Zinc Acetate. Description, solubility, identification, reaction, alkalies or alkaline earths, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Zinc Chloride. Description, solubility, identification, reaction, oxychloride, sulfate, ammonium salts, alkalies or alkaline earths, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Zinc Oxide. Description, solubility, identification, loss on ignition, carbonate, alkali, arsenic, iron and many other metals, lead, assay, and storage. U.S.P. product of zinc oxide—Unguentum Zinci Oxidi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Zinc Oxide Ointment (Zinc Ointment). Preparation (calcium, magnesium, and other foreign substances) and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Zinc Stearate. Description, solubility, identification, reaction, alkalies or alkaline earths, fatty acid, solidification temperature, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Zinc Sulfate. Description, solubility, identification, reaction, free acid, alkalies and alkaline earths, arsenic, heavy metals, assay, and storage.

U. S. Gov., Army-Navy Aeronautical Specification AN-O-Z-361; 1938. Zinc-Cyanide.

U. S. Gov., Federal Specification TT-W-576a; 1941. Wood-Preservative; Zinc-Chloride (for) Ties and Structural Timbers. Covers one grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-W-581; 1941. Wood-Preservative; Zinc-Meta-Arsenite (ZMA). Covers one grade. Gives detail requirements and methods of sampling, inspection, and tests.

U. S. Gov., Navy Dept. Specification 51C37; 1943. Compound; Soot-Remover.

U. S. Gov., Navy Dept. Specification 51 C 38; 1944. Chemicals; Fire-Retardant, for Lumber and Timber.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-435A; 1936. Zinc Chloride.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-440A; 1926. Zinc Dust.

References.—Unit weights, labeling poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810; zinc arsenite, insecticide, *see* 881.19; tests for zinc in canned foods, *see* 120; preservative treatment of lumber, *see* 400.4; zinc paint pigments, *see* 842.7.

839.39 Miscellaneous Compounds, Mixtures, and Salts of Metals

American Chemical Society. Specifications for Analytical Reagents, 1941. Cadmium Chloride. Gives requirements for insoluble matter, nitrate, sulfate, ammonia, copper, iron, lead, substances not precipitated by ammonium sulfide, zinc, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Cadmium Sulfate. Gives requirements for insoluble matter, chloride, nitrate, arsenic, copper, iron, lead, substances not precipitated by ammonium sulfide, zinc, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Manganese Sulfate. Gives requirements for water of crystallization, insoluble matter, chloride, alkalies and alkaline earths, iron, heavy metals, nickel, zinc, substances reducing permanganate, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Stannous Chloride. Gives requirements for solution, sulfate, arsenic, substances not precipitated by hydrogen sulfide, iron, other metals, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Uranium Nitrate. Gives requirements for insoluble matter, chloride, sulfate, alkalies and alkaline earths, heavy metals, iron, uranous uranium, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Auric Chlorid, Auric Sulfid, Cadmium Sulfate, Cadmium Sulfid, Cerium Oxalate, Indium, Iridium, Lithium Benzoate, Lithium Bromid, Lithium Carbonate, Magnesium Carbonate, Magnesium Chlorid, Magnesium Phosphate, Magnesium Sulfate, Manganous Acetate, Manganous Carbonate, Manganous Chlorid, Manganous Oxid, Metallic Gold, Metallic Nickel, Metallic Platinum, Metallic Tin, Nickel Carbonate, Nickel Sulfate, Palladium, Platinum Hydrochlorid, Selenium, Sodium Ayro-Chlorid, Sodium Platino Chlorid, Strontium Carbonate, and Tellurium. Chemical symbol, synonyms, description, and preparations for triturations for use in homoeopathic medicines.

American Leather Chemists Assn. Methods of Sampling and Analysis. Epsom Salts, 1942. Gives requirements for magnesium oxide, sulfur trioxide, and iron.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Magnesium Sulfate. Gives chemical composition, assay, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Artificial Carlsbad Salt. Gives chemical composition, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Artificial Kissingen Salt. Gives chemical composition, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Artificial Vichy Salt. Gives chemical composition, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Compound Effervescent Salt of Potassium Bromide (Effervescent Potassium Bromide With Caffeine). Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Effervescent Artificial Carlsbad Salt. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Effervescent Artificial Kissingen Salt. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Effervescent Artificial Vichy Salt. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Effervescent Salt of Lithium Citrate. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Effervescent Salt of Magnesium Sulfate. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Effervescent Salts. Gives general processes; directions for granulating in an oven and on a water bath.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formularv, Seventh Edition, 1942. Elixir of Hydrangea and Lithium. Gives chemical composition, storage, alcohol content, average dose, and preparation.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Infusion of Senna With Magnesium Sulfate. Gives chemical composition, preparation, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lithium Benzoate. Gives chemical composition, description, solubility, identifications, loss on drying, reaction, carbonate, other alkalies, coloring matter, chlorinated compounds, heavy metals, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lithium Bromide. Gives chemical composition, description, solubility, identification, reaction, chloride, iodide, bromate, sulfate, other alkalies, heavy metals, assay, storage, preparations, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lithium Carbonate. Gives chemical composition, description, solubility, identification, loss on drying, acetic acid insoluble substances, reaction, other alkalies, chloride, sulfate, aluminum or iron, arsenic, heavy metals, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lithium Citrate. Gives chemical composition, description, solubility, identifications, loss on drying, reaction, carbonate, other alkalies, arsenic, heavy metals, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Lithium Salicylate. Gives chemical composition, description, solubility, identifications, loss on drying, reaction, carbonate, other alkalies, coloring matter, arsenic, heavy metals, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Manganese Glycerophosphate. Gives chemical composition, description, solubility, identifications, loss on drying, chloride, phosphate, sulfate, arsenic, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Manganese Hypophosphite. Gives chemical composition, description, solubility, identification, loss on drying, carbonate, phosphate, sulfate, calcium, arsenic, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Soluble Manganese Citrate. Gives chemical composition, description, solubility, identification, carbonizable impurities, reaction, chloride, sulfate, arsenic, iron, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Strontium Bromide. Gives chemical composition, description, solubility, identification, loss on drying, reaction, bromate, chloride, iodide, barium, calcium, heavy metals, assay, storage, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Strontium Salicylate. Gives chemical composition, description, solubility, identification, loss on drying, reaction, free salicylic acid, barium, heavy metals, assay, storage, and average dose.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Epsom Salt. Covers definition, derivation, solubility, uses, grades, supply, and packing.

Toilet Goods Assn. Inc. Specification No.10; 1942. Talc. Gives requirements for color, odor, identity, screen test, solubility, slip, lustre, apparent density, lead, arsenic, alkalis and acids, carbonates, sharp particles, loss on ignition, soluble calcium, and acid soluble iron.

Toilet Goods Assn. Inc. Specification No.12; 1943. Titanium Dioxide. Gives requirements for color, odor, particle size, water soluble, acid soluble, loss on ignition, acid and alkali, moisture, assay, arsenic, and lead.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Butyl Aminobenzoate. Description, solubility, melting point, identification, ash, chloride, sulfate, heavy metals, completeness and color of solution, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Heavy Magnesium Oxide (Heavy Magnesia). Description, other tests, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Magnesia Magma (Milk of Magnesia). Description, identification, reaction, soluble salts, soluble alkalies, carbonate, arsenic, calcium, heavy oils, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Magnesium Carbonate (Carbonate of Magnesia). Description, solubility, identification, soluble salts, arsenic, calcium oxide, heavy metals, iron, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Magnesium Oxide (Magnesia, Light Magnesia). Description, solubility, identification, loss on ignition, soluble salts, carbonate, arsenic, calcium oxide, heavy metals, iron, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Magnesium Sulfate (Epsom Salt). Description, solubility, identification, loss on drying, reaction, chloride, arsenic, heavy metals, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Magnesium Trisilicate. Description, solubility, identification, loss on ignition, soluble salts, chloride, sulfate, free alkali, heavy metals, absorptive power, acid-consuming capacity, assay for magnesium oxide, assay for silicon dioxide, ratio of MgO to SiO_2, and storage. U.S.P. product of magnesium trisilicate—Tabellae Magnesii Trisilicatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Magnesium Trisilicate Tablets. Identification, free alkali, acid-consuming capacity, absorption of methlene blue, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Solution of Magnesium Citrate. Description, identification, chloride, sulfate, tartaric acid, minimum of total citric acid, and assay for magnesium oxide.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tribasic Magnesium Phosphate. Description, solubility, identification, loss on ignition, acid-insoluble substances, soluble salts, carbonate, chloride, nitrate, sulfate, arsenic, barium, calcium, heavy metals, dibasic salt and magnesium oxide, assay, and storage. U.S.P. product of tribasic magnesium phosphate—Tabellae Magnesii Phosphatis Tribasici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Tribasic Magnesium Phosphate Tablets. Identification, calcium, soluble salts, assay, storage, and sizes.

U. S. Gov., Federal Specification O-S-61; 1930. Salts; Nickel (for) Electroplating and Electrotyping. Covers three compounds—(A) nickel sulphate (single salt), (B) nickel ammonium sulphate (double salt), and (C) nickel chloride. Gives chemical formulae; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification TT-R-58; 1941. Amendment 1; 1941. Radio-Active-Luminous Compound and Adhesives. Covers five grades and brightness. Gives detail requirements for radioactive component, initial brightness in micro-lamberts, adhesives, and exposure to radiation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51B4a; 1942. Baths; Salt, for Heating Metals.

U. S. Gov., Navy Dept. Specification 51 D 11; 1944. Dichlorodifluoromethane (F-12).

U. S. Gov., Navy Dept. Specification 52R8a; 1938. Resinate; Manganese, Precipitated.

U. S. Gov., Navy Dept. Specification 52R9c; 1945. Radioactive-Luminous-Material (Powder Form).

U. S. Gov., U. S. Army, Army Air Forces. Specification 4-1044; 1936. Cadmium Oxide.

U. S. Gov., U. S. Army, Chemical Warfare Service Specification 4-503-260B; 1938. Magnesium Oxide; Light.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-21-18; 1941. Magnesium Silicate Fibrous.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-29; 1926. Hopcalite.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 197-54-172; 1942. Magnesium Arsenide.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1060; 1937. Gold Chloride; Reagent Grade.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1063; 1937. Platinic Chloride; Reagent Grade.

References.—Unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810; magnesium arsenate, insecticide *see* 881.19; tests for metals in canned foods, *see* 120.

839.4 GASES AND TOXIC DUSTS*

839.40 General Items

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 1; 1936. Measurement and Control of Industrial Dusts. Relates to the preventive engineering aspects of the problems of industrial diseases caused by factory air contaminants. Covers methods of determining dust, analysis of dust, the size of dust particles, dust collection, protective equipment, permissible dustiness, and investigations needed.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 2, Part 3; 1938. The Determination of Chlorinated Hydrocarbon Vapors in the Atmosphere. Covers taking of sample, analysis of sample, sample calculation, chloronaphthalenes and chlorodiphenyls, and brominated compounds.

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 2, Part 7; 1938. Identification of Industrial Dusts. Covers chemical examination, petrographic examination, technique, examples of application, variations in composition with size, table showing dust from shakeout, summary, and table showing characteristics of a few minerals commonly found in dusts.

Natural Gasoline Assn. of America. Standard Method for Determining the Specific Gravity of Gases.

839.41 Carbon Dioxide

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Carbon Dioxide (Carbonic Acid Gas). Description, solubility, identification, acid and sulfur dioxide, phosphine, hydrogen sulfide, organic reducing substances, carbon monoxide, assay, and storage.

U. S. Gov., Army Air Forces. Specification 14069-A; 1941. Carbon Dioxide; Liquid.

U. S. Gov., Navy Dept. Specification 51C16c; 1943. Carbon Dioxide (CO_2); Compressed.

U. S. Gov., Treasury Dept., Procurement Div., No. 505; 1941. Carbon Dioxide (Compressed); Technical Grade. Compressed carbon dioxide (CO_2) shall be furnished in one grade in cylinders containing 20 to 50 lbs. Gives requirements for odor, carbon dioxide content, moisture content, acidity, separated water, cylinders, and valve outlet; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 662; 1944. Carbon Dioxide; Solid (Dry Ice). Covers one type and one grade of solid carbon dioxide intended as a cooling or refrigerating agent. Gives requirements for color and body, weight per cubic foot, moisture content, oil content, and odor; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-95; 1926. Carbon Dioxide; Liquid.

839.42 Hydrogen

U. S. Gov., Treasury Dept., Procurement Div., No. 636; 1943. Hydrogen; Technical Grade. Covers one grade. Gives requirements for capacity of cylinders, dryness, impurities, and cylinders shall have commercial finishes and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 4-83A; 1942. Hydrogen.

839.43 Oxygen

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Oxygen. Description, solubility, identification, acids or alkalies, carbon dioxide, oxidizing substances, halogens, carbon monoxide, assay, and storage.

U. S. Gov., Army-Navy Aeronautical Specification AN-O-1b; 1944. Oxygen; Aviators' Breathing (Gas).

U. S. Gov., Navy Dept. Specification 51G3; 1942. Gas; Oxygen; Cutting and Welding (Shore Use).

U. S. Gov., Treasury Dept., Procurement Div., No. 547; 1942. Oxygen; Technical Grade (for Use in Cutting and Welding). Not intended for breathing or medical purposes. Covers one grade compressed within cylinders and free from objectionable odor. Gives requirements for oxygen content, dryness, cylinders, and valves; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Food and Drugs Act and Regulations, *see* 810.

839.44 Chlorine

Chlorine Institute, Inc. Method for Determination of Hydrogen in Loaded Class I.C.C. 105A300 Tank Cars, 1930. For combustion of sample of the vapor phase of a liquid chlorine container, preparation of absorbent solution, combustion in a Burrell dual ignition gas pipette, measuring burette design, and formula for calculation of hydrogen present.

839.45 Nitrous Oxide

American Standards Assn. Z 37.13-1944. Allowable Concentration of Oxides of Nitrogen. To prescribe the permissible concentration of oxides of nitrogen in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Covers general, physical-chemical, and toxic properties of nitrogen oxides; permissible concentration; sampling procedure; and qualitative and quantitative analytical methods.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Nitrous Oxide (Nitrogen Monoxide). Description, solubility, acids, or alkalies, carbon dioxide, oxidizing substances, reducing substances, halogens, assay, and storage.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-132; 1940. Nitrogen, for Sealed Storage of Rubber Components.

References.—Food and Drugs Act and Regulations, *see* 810.

839.49 Miscellaneous Gases and Toxic Dusts

American Standards Assn., Z 37.1-1941. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Carbon Monoxide. To prescribe the permissible concentration of carbon monoxide in the atmosphere of work places for the protection of the health of all workers. Gives properties of carbon monoxide, permissible concentration, sampling, and analytical methods.

American Standards Assn., Z 37.2-1941. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Hydrogen Sulfide. To prescribe the permissible concentration of hydrogen sulfide in the atmosphere of work places for the protection of the health of all workers. Gives properties of hydrogen sulfide, permissible concentration, sampling, and analytical methods.

American Standards Assn., Z 37.6-1942. Prepared by the U. S. Public Health Service. Allowable Concentration of Manganese (American War Standard). To prescribe the permissible concentration of manganese dust and fumes in the atmosphere of work places for the protection of the health of all workers. Gives properties of manganese, permissible concentration, sampling procedure, and analytical methods.

Compressed Gas Manufacturers' Assn., Inc. Method of Analysis for Refrigeration Grade Liquid Sulfur Dioxide. Tentative standard, 1932. Covers procedures for determination of minute quantities of moisture, reagents, apparatus, diagrams of types of sampling tubes, requirements for sample container, heat exchanger, drying tubes, sampling, computations, residue test, sulfuric acid test, and procedures for noncondensible gases.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Acetylene. Covers definition, constants, solubility, derivation, uses, grades, containers, hazards, shipping regulations, and substitutes.

Technical Assn. of the Pulp and Paper Industry. Analysis of Sulphur-Burner Gas. Standard T 603 m-36; 1936. Requires use of Orsat apparatus for control tests for sulphur dioxide and sulphur trioxide. Describes apparatus and reagents required and method of calculation.

Underwriters' Laboratories, Inc. Standard for Gas Systems for Protection of Vaults Against Burglary, 1929. For door and lock and entire vault; covers design and construction, practicability, durability, reliability, effectiveness, operation, safety control, and marking.

Underwriters' Laboratories, Inc. Standard for Normally Operated Gas Systems for Protection Against Interior Robbery, 1934. For use in banks, post offices, cashiers' cages, etc.; area of coverage, door closers and locks, details of design and construction, reliability, distribution, location of controls, installation, testing, and maintenance.

U. S. Gov., Navy Dept. Specification 51 N 3c; 1943. Nitrogen for Use in Optical Instruments.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 4-4; 1919. Sulphur Dioxide.

References.—Illuminating gas, *see* 997.2.

839.5 HYDROQUINONE (HYDROCHINONE)

U. S. Gov., Federal Specification O-H-886; 1935. Hydroquinone (Paradihydroxybenzene). Covers one grade. Gives requirements for color, solubility, melting point, ash, sulfate, catechol, and resorcinol; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

839.6 CARBON DISULPHIDE

American Chemical Society. Specifications for Analytical Reagents, 1941. Carbon Disulfide. Gives requirements for boiling range, nonvolatile matter, foreign sulfides, sulfite and sulfate, water, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Carbon Disulfid. Chemical symbol, synonyms, description, and preparations for tincture, dilutions, and medications for use in homoeopathic medicines.

American Standards Assn., Z 37.3-1941. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Carbon Disulfide. To prescribe the permissible concentration of carbon disulfide in the atmosphere of work places for the protection of the health of all workers. Gives properties of carbon disulfide, permissible concentrations, sampling, and analytical methods.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Carbon Bisulphide. Covers definition, constants, derivation, solubility, purity, uses, supply, packing, and shipping regulations.

U. S. Gov., Treasury Dept., Procurement Div., No. 624; 1943. Carbon Disulfide; Technical Grade. Covers one type and one grade. Intended for use as a solvent and for other technical uses and is a highly inflammable volatile liquid. Gives requirements for material, appearance, color, odor and residual odor, specific gravity, nonvolatile matter, water, spot test, distillation range, and copper corrosion; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-21-22; 1939. Carbon Disulfide; Technical Grade.

References.—Unit weights, *see* 830.

839.7 CARBON TETRACHLORIDE

American Chemical Society. Specifications for Analytical Reagents, 1941. Carbon Tetrachloride. Gives requirements for boiling point, nonvolatile matter, acid, aldehyde, chloride, free chlorine, iodine-consuming substances, substances darkened by sulfuric acid, sulfur compounds, and tests.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Chloroform and Carbon Tetrachloride. For carbon tetrachloride as a medicinal, carbon tetrachloride in capsules, and carbon tetrachloride mixtures; tentative method for determining amount of carbon tetrachloride.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Carbon Tetrachloride. Covers definition, physical properties, solubility, derivation, grades, containers, shipping regulations, uses, and substitutes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Carbon Tetrachloride. Description, solubility, specific gravity, distillation range, nonvolatile residue, carbonizable substances, acid, chloride ion, free chlorine, carbon disulfide, and storage. U.S.P. product of carbon tetrachloride—Capsulae Carbonei Tetrachloridi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Carbon Tetrachloride Capsules. Identification, assay, storage, and sizes.

U. S. Gov., Federal Specification O-C-141; 1944. Amendment 1; 1944. Carbon Tetrachloride; Technical Grade. Covers one grade intended for general use as a solvent. Gives requirements for appearance, color, odor, specific gravity, nonvolatile matter, spot test, neutrality, water, distillation range, and copper corrosion; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-110B; 1937. Carbon Tetrachloride.

References.—Unit weights, *see* 830; Food and Drugs Act and Regulations, *see* 810.

839.8 LIQUID CHLORINE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Liquid Chlorine. Covers description, constants, solubility, derivations, purity, grades, specifications, substitutes, containers, shipping regulations, and uses.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 4-1A; 1938. Chlorine; Liquid.

839.9 MISCELLANEOUS SPECIFICATIONS FOR CHEMICALS AND CHEMICAL COMPOUNDS

American Chemical Society. Specificatior for Analytical Reagents, 1941. Arsenic Trioxide. Gives requirements for nonvolatile matter, insoluble in ammonium hydroxide, chloride, sulfide, antimony and other hydrogen sulfide metals, iron, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Bromine. Gives requirements for specific gravity, nonvolatile matter, iodine, organic bromine compounds, sulfur compounds, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. 8-Hydroxyquinoline. Gives requirements for melting point range, insoluble in alcohol, residue on ignition, sulfate, suitability for magnesium determinations, and tests.

American Chemical Society. Specifications for Analytical Reagents, 1941. Iodine. Gives requirements for form, nonvolatile matter, chlorine and bromine, and tests.

American Institute of Homoeopathy. Homoeopathic Pharmacopoeia of U. S., 1941. Amyl Nitrite, Bromin, Phosphorous, Red Phosphorous, Silica, Sulfur, Sulfur Di-Iodid, and Uranium Nitrate. Chemical symbol, synonyms, description, and preparations for triturations, tincture, dilutions, and medications for use in homoeopathic medicines.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ethyl Acetate (Acetic Ether). Gives chemical composition, description, miscibility, specific gravity, boiling point, identification, residue, carbonizable impurities, free acid, butylic or amylic derivatives, methyl compounds, assay, storage, preparation, and average dose.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Phosphorus. Gives description, solubility, identification, sulfate and arsenic, storage, preparations, and average dose.

American Society for Testing Materials, D 302-33; 1933. Ethyl Acetate (85 to 88 Percent Grade). Requirements for specific gravity, distillation range, nonvolatile matter, odor, color, water, acidity and ester value, with tests using A.S.T.M. Method D 268.

American Society for Testing Materials, D 303-40; 1940. Normal Butyl Acetate (88 to 92 Percent Grade). Gives requirements on specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, ester value, and test using A.S.T.M. Method D 268.

American Society for Testing Materials, D 320-40; 1940. Butyl Propionate (90 to 93 Percent Grade). Specifications cover gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and ester value, using A.S.T.M. Method D 268.

American Society for Testing Materials, D 321-40; 1940. Ethyl Lactate (Synthetic). Specification for gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and ester value, with test using A.S.T.M. Method D 268.

American Society for Testing Materials, D 330-35; 1935. Ethylene Glycol Monobutyl Ether. Also known as butyl glycol. Requirements for specific gravity, color, distillation range, nonvolatile matter, odor, water, and acidity, with tests using A.S.T.M. Method D 268.

American Society for Testing Materials, D 331-35; 1935. Ethylene Glycol Monoethyl Ether. Limiting values for specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and for tests using A.S.T.M. Method D 268. This material is also known as ethyl glycol.

American Society for Testing Materials, D 343-35; 1935. Acetate Ester of Ethylene Glycol Monoethyl Ether (95 to 96 Percent Grade). Covers properties including specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and ester value, with tests using A.S.T.M. Method D 268. Also known as ethyl glycol acetate.

American Standards Assn., Z37.15-1944. Allowable Concentration of Styrene Monomer (American War Standard). To prescribe the maximum permissible concentration of styrene monomer in the atmosphere of work places. Covers properties of styrene monomer (phenyl ethylene), permissible concentration, and sampling procedure and analytical methods.

American Wood-Preservers' Assn., 61b; 1944. Standard Specification for Tanalith. Gives requirements for chemical composition and proportions of ingredients and tolerances.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Abrastol (Asaprol). Tentative method for tests for presence of.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Insoluble Fluorides, Fluoborates, Fluosilicates, etc. Preparation of sample; test methods for indicating presence of insoluble fluorides.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Saccharin. Preparation of sample, qualitative test methods, quantitative test.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Soluble Fluorides. Qualitative test methods for indicating presence of.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Sucrol or Dulcin. Tentative test methods for indicating presence of.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Barite (Baryte, Heavy Spar, Tiff). Covers definition, constants, solubility, occurrence, grades, containers, uses, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Ethylene Dichloride. Covers definition, constants, derivation, purity, solubility, uses, and packing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Ortho-Dichlorobenzene (Technical). Covers definition, constants, derivation, solubility, purity, uses, and packing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Tetrachlorethylene. Covers definition, constants, derivation, solubility, uses, grades, and packing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Anthracene. Covers definition, constants, solubility, derivation, grades, uses, and containers.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Bromine. Covers definition, constants, solubility, derivation, forms, uses, hazards, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Butyl Stearate. Covers definition, constants, acidity, solubility, derivation, uses, containers, grades, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Diacetone. Covers definition, constants, solubility, derivation, uses, grades, containers, shipping regulations, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Dibutyl Phthalate. Covers definition, constants, solubility, derivation, uses, grades, containers, hazards, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Methyl Ethyl Ketone. Covers definition, constants, solubility, derivation, uses, containers, shipping regulations, hazards, and substitutes.

Technical Assn. of the Pulp and Paper Industry. Analysis of Sulphate White and Green Liquors. Tentative Standard T 624 m-44; 1944. Deals with the analysis of both white and green liquors in the sulphate process. Covers gravity, sodium sulphate, alkalinity, reducing agents, total sodium, total sulphur, silica, and aluminum and iron oxides.

Technical Assn. of the Pulp and Paper Industry. Analysis of Sulphate Black Liquor. Tentative Standard T 625 m-44; 1944. Deals with the analysis of black liquor separated from the pulp in the blow pits, diffusers and washers of the sulphate process. Covers gravity, total solids, sulphated ash and organic matter, silica, total sodium, aluminum and iron oxides, sodium sulphate, total sulphur, alkalinity, sodium sulphide, and sodium sulphite and thiosulphate.

Toilet Goods Assn. Inc. Specification No. 13; 1944. Propylene Glycol. Gives requirements for odor, solubility, specific gravity, ash, acidity, chloride, sulfate, heavy metals, distillation range, arsenic, and assay.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Aminopyrine. Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, chloride, heavy metals, antipyrine, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Amyl Nitrite. Description, solubility, specific gravity, identification, free acid, aldehyde, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Antipyrine (Phenazone). Description, solubility, melting point, identification, loss on drying, ash, reaction, heavy metals, completeness and color of solution, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethyl Aminobenzoate (Benzocaine). Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, free acid, chloride, arsenic, heavy metals, and storage. U.S.P. product ethyl aminobenzoate—Unguentum Aethylis Aminobenzoatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethyl Aminobenzoate Ointment. Preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethyl Carbamate (Urethane). Description, solubility, melting point, identification, loss on drying, ash, reaction, chloride, nitrate, urea, completeness and color of solution, heavy metals, and storage. U.S.P. product of ethyl carbamate—Injectio Quininae Hydrochloridi et Aethylis Carbamatis.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethyl Chaulmoograte. Description, solubility, specific gravity, specific rotation, saponification value, iodine value, free acid, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethyl Chloride. Description, solubility, specific gravity, nonvolatile residue, chloride ion, acid, alcohol, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Ethyl Oxide (Solvent Ether). Description, aldehyde, peroxide, other requirements, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Precipitated Sulfur. Description, solubility and identification, loss on drying, residue on ignition, acid or alkali, arsenic, other forms of sulfur, assay, and storage. U. S. P. product of precipitated sulfur—Unguentum Sulfuris.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Saccharin (Gluside, Benzosulfimide). Description, solubility, melting point, identification, loss on drying, ash, carbonizable substances, reaction, ammonium compounds, glucose and lactose, heavy metals, benzoic and salicylic acids, and storage. U.S.P. product of saccharin—Saccharinum Sodicum.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Saccharin Sodium (Soluble Saccharin, Soluble Gluside, Sodium Benzosulfimide). Description, solubility, identification, reaction, heavy metals, benzoate and salicylate, other tests, and storage. U.S.P. product of saccharin sodium—Tabellae Saccharini Sodici.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Saccharin Sodium Tablets (Soluble Saccharin Tablets). Identification, ammonium salts, assay, storage, and sizes.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sublimed Sulfur (Flowers of Sulfur). Description, solubility, identification, residue on ignition, arsenic, assay, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sulfur Ointment. Preparation and assay.

U. S. Gov., Army Air Forces. Specification 14116; 1942. Compound; Anti-Frosting (for Aircraft Windows).

U. S. Gov., Army Air Forces. Specification 40828-1; 1945. Packet; Shark Deterrent.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Arsenic Trioxide, Sample 83a. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Refined Silicon, Sample 57. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Joint Army-Navy Specification JAN-D-56; 1944. Dichlordiphenyl Trichloroethane (DDT) (Technical Grade).

U. S. Gov., Navy Dept. Specification 51C15; 1924. Compound; Cyanide.

U. S. Gov., Navy Dept. Specification 51C 29a; 1943. Chemicals; Testing, Dissolved-Oxygen.

U. S. Gov., Navy Dept. Specification 51M6; 1945. Monoethanolamine (Ethanolamine).

U. S. Gov., Navy Dept. Specification 51 O 1; 1941. Orthodichlorobenzene; Technical.

U. S. Gov., Navy Dept. Specification 51P14; 1937. Pyridine.

U. S. Gov., Navy Dept. Specification 51T3; 1943. Trichloroethylene.

U. S. Gov., Navy Dept. Specification 51T6; 1944. Tetrachlorethane (Acetylene Tetrachloride).

U. S. Gov., Treasury Dept., Procurement Div., 562a; 1942. Diethyl Sulfate (Technical). Covers one type and one grade intended for use as an ethylating agent in the manufacture of drugs and in the manufacture of dyeline sensitized paper. Gives requirements for appearance, color, odor, purity, specific gravity, ash content, distillation range, water, acidity, and solubility; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.566; 1942. Ethylene Glycol Mono Ethyl Ether. Covers one type and one grade intended for use in the manufacture of organic protective coatings. Gives requirements for appearance, color, odor, specific gravity, distillation range, nonvolatile matter, acidity, spot test, sulfur, and water test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div,, 644a; 1945. Soda-Lime. Covers one grade; two types—(I) dry and (II) moist; and two classes—(A) 4 to 8 mesh and (B) 8 to 16 mesh. Shall be a uniform product consisting of calcium hydroxide, and sodium or potassium hydroxide or both, in granular form. Gives requirements for moisture content, particle sizes, absorption of carbon dioxide, indicator color change, and hardness numbers; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.652; 1944. Iodine; Technical Grade. Covers one type and one grade in the form of granules, flakes, or plates; intended for use in photography, process engraving, and lithography. Not for pharmaceutical purposes. Gives requirements for iodine content, nonvolatile residue, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 4-1048; 1936. Methyl Butyl Ketone (90-95 Percent Grade).

U. S. Gov., U. S. Army, Army Air Forces. Specification 4-1049; 1936. Secondary Butyl Acetate.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-502-12; 1933. Acetylene Tetrachloride.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-215; 1924. Hexachlorethane.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-300A; 1939. Phosphorus; Red.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 4-503-305A; 1941. Phosphorus; White.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-21-1A; 1942. Chlorpicrin.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-21-9; 1939. Sulfur Monochloride.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-31-5A; 1939. Chlorosulfonic Acid, Sulfur Trioxide Solution, FS.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-111-8A; 1941. Chloracetophenone.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-111-16A; 1939. Diphenylaminechlorarsine (DM).

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-111-32; 1940. Diphenylchlorarsine (DA).

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1125; 1944. Amyl Nitrite (Inhalants).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-45A; 1930. Ether.

References.—Other chemicals for medicinal purposes, *see* 810-829; iodine for medicinal purposes, *see* 814.1; unit weights, labeling of poisons, *see* 830; Food and Drugs Act and Regulations, *see* 810.

840-849 PAINTS, VARNISHES, LACQUERS, AND RELATED PRODUCTS

840. GENERAL ITEMS RELATING TO PAINTS AND PAINTING

840.1 PAINTS AND PAINTING

American Assn. of State Highway Officials. Standard Specifications for Highway Bridges, 1941. Includes specifications for painting metal structures—requirements for materials (to conform to A.A.S.H.O. Standard Specifications), number of coats and color, mixing of paint, weather conditions, application, spraying, inaccessible surfaces, removal of paint, thinning paint, painting galvanized surfaces, cleaning of surfaces (by hand, sandblasting, and flame), shop painting, and field painting.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Painting and Glazing. Gives requirements for materials; application; preparing the surface; time for drying; weather and temperature; priming coats; painting and finishing wood surfaces; painting steel, iron, sheet metal, plaster, brick, and concrete surfaces; staining shingles; sign painting; and lettering.

American Water Works Assn. Tentative Recommended Practice—Repainting Elevated Steel Tanks and Water Storage Tanks, With Notes on Repairs, 7H.2-T-1943. Covers frequency of painting, number of coats, inside tank, kind of paint, repairs, rivets, spider rods, leaks, inspections, and precautions.

Assn. of American Railroads. Operations and Maintenance Dept., Engineering Division, Signal Section. Manual of Recommended Practice. Specification 120-40; 1941. Paint and Painting. For railway signal service, workmanship for shop and field work, with approved materials tested by A.A.R., Signal Section standards.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Paint. Covers definition, constants, types and uses, components, containers, and ordering instructions.

National Paint, Varnish, and Lacquer Assn., Inc. Circular 668; 1944. This circular consists of abstracts of U. S. Gov. specifications for paints and related materials. An attempt has been made to include all the information that is needed to give to sellers and buyers of paint and related materials, writers of specifications, and paint and varnish technologists; essential data needed for preliminary actions pertaining to them.

Painting and Decorating Contractors of America. Painting Specifications. Cover requirements in general; requirements for interior and exterior painting of concrete, brick, stucco, stone, galvanized iron, sheet metal, shingles, steel sash, structural steel, wood floors, siding trim, plaster, canvased walls, and acoustic material; material definitions; and requirements for refinishing previously painted surfaces.

Portland Cement Assn. Specification for Application of Portland Cement Paint (on Exposed Concrete Masonry Walls), 1940. Requirements for factory prepared and job-mixed cement paint; preparation of surface, for seal coat, and finish coat; and curing.

U. S. Gov., Army Air Forces. Specification 20020-A; 1941. Protective Coatings and Finishes for Automotive Vehicles; General Specification for.

U. S. Gov., Dept. of Agriculture, Technical Bulletin 804; 1942. Classification of House and Barn Paints. This bulletin is to aid in developing the best methods of selecting and applying paint and maintaining painted surfaces on wooden farm buildings. Describes a system of classifying paints by groups, types, and grades. Covers why classification is needed, classification outlined, use of classification, and calculating classification from paint formulas.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R144-43; 1943. Paints, Varnishes, and Related Products (Colors and Containers). This recommendation establishes a schedule for limiting colors and eliminating superfluous sizes of containers in order to conserve metals and materials needed for defense purposes. It lists various items of oil, paints, enamels, varnishes, water mixed paints, etc., and gives the recommended maximum number of colors and sizes of containers for each. Initiated by National Paint, Varnish and Lacquer Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS 44; 1940. Surface Treatment of Steel Prior to Painting. A number of surface-treatment processes are described for both plain and galvanized steel.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Building Materials and Structures Report BMS 102; 1944. Painting Steel. A large number of priming and finish-coal paints, representing various types, were tested for durability and protective value against corrosion by means of accelerated laboratory and outdoor-exposure tests. Covers introduction, priming-coat paints, painting plain steel surfaces, painting galvanized-steel surfaces, topcoat paints, summary and conclusions, and selected references.

U. S. Gov., Treasury Dept., Procurement Div., No.360; 1939. Paint (Marine); General Specifications (Methods of Testing). This specification covers technical requirements and the methods are intended for testing various glyceryl phthalate marine enamels and paints. Gives requirements for sampling, general procedure, composition determination, and physical and performance tests.

U. S. Gov., U. S. Army, Army Air Forces. Specification 3-100-1; 1942. Protective Coatings and Finishes for Aircraft and Aircraft Parts; General Specification for.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-1F; 1943. Paint and Related Materials; General Specifications.

U. S. Gov., U. S. Maritime Commission. Specification MC-52-A-1; 1939. Amendment 3; 1944. Paint and Paint Materials (Other Than Ships' Bottom Paints). Covers approval, lists 42 classes of paints and paint materials, general requirements, specific requirements for each class, packing, containers, marking of deliveries, and inspection.

U. S. Gov., U. S. Maritime Commission. Specification MC-52-B-1; 1939. Ships' Bottom Paints and the application Thereof. Covers approval; lists four classes—(I) anticorrosive paints, (II) antifouling paint, (III) red boottopping paints, and (IV) hull stern plate coating; general requirements, detail requirements, specific requirements for each class, packing and marking, inspection of paints, and preparation of ships' bottoms for painting and application of paint thereto including general, rigging, scaling of bottoms, cleaning and drying of bottoms, preparation of paints, application of paint, care of opened drums, cooperation in return of empty paint drums, and inspection of services.

840.2 SAFETY CODES FOR HANDLING AND STORAGE OF PAINTS AND VARNISHES

Associated Factory Mutual Fire Insurance Companies. Japan Application and Drying. Enamel, Paint, and Varnish, 1938. Recommended safeguards for use in storage and mixing and application of finishes as regards isolation of materials and rooms, ventilation, overflow pipes and drains for dip tanks, construction of drying and baking ovens, etc.

Associated Factory Mutual Fire Insurance Companies. Pyroxylin Lacquer, 1931. Information on hazards present and safeguards recommended in storage, mixing, spraying, dipping, and spreading of pyroxylin lacquer as regards location of buildings or rooms, ventilation, protection of electrical equipment, provision of automatic sprinklers, good housekeeping, etc.

National Board of Fire Underwriters. Paint Spraying and Spray Booths, No.33; 1941. Standards covering application of paint, varnishes, lacquers and similar flammable finishes, by spraying with an air brush or direct pressure. Gives introduction, location, spraying enclosures, booths, blower and exhaust systems, electric equipment, containers, mixing rooms and circulating pipe systems, protection, maintenance, and hydrogen peroxide spraying.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Dip Tanks, Containing Flammable Liquids. Covers classification of tanks, location, storage of flammable liquids, control of hazards, ventilation, construction and installation, hoods and curtains, automatic heat actuated devices, fire protection, and special requirements for various classes.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Paint Spraying and Spray Booths. Standards for paint spraying and spray booths using flammable materials. Covers location, spraying enclosures, booths, blower and exhaust systems, electric equipment, containers, mixing rooms, protection, maintenance and hydrogen peroxide spraying.

References.—Dip tanks for application of varnish, *see* 956.2; enameling and japanning ovens, *see* 614.9.

840.3 TERMS RELATING TO PAINT

American Society for Testing Materials, D 16-44 T; 1944. Tentative Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products. Defines baking finish, baking temperature, color, drier, drying oil, enamel, filler, fineness, flattening agent, forced drying temperature, U. S. gallon, Imperial gallon, hiding power, lake, nondrying oil, nonvolatile oil, opacity, paint, pigment, resin, semidrying oil, shade, size, specific gravity, spreading rate, tint, tinting strength, toner, varnish, vehicle, and volatile thinner.

840.4 PAINT COLORS

U. S. Gov., Federal Specification TT-C-591; 1934. Amendment 1; 1934. Colors; (for) Flag of the U. S. Provides a general method for use in the procurement of materials having the red, white and/or blue colors of the flag, and a precise colorimetric definition of the standard colors for purpose of record.

U. S. Gov., Federal Specification TT-P-381; 1944. Pigments-in-Oil; Paint-Colors. Covers one type and colors in blacks, blues, browns, greens, oranges, reds, and yellows. Gives requirements for color, character of tint, tinting, strength, pigment content, coarse particles and skins, properties of vehicle, consistency, and skinning; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-X-61c; 1941. Colors; Artists Oil.

840.5 TESTS OF PAINTS AND VARNISHES

American Society for Testing Materials, D 34-39; 1939. American Standards Assn., K15-1939. Methods of Chemical Analysis of White Pigments. Includes preparation of sample, determination of small amounts of iron, methods of analysis of basic carbonate of lead, basic sulfate of lead, zinc-lead and leaded-zincs, zinc-oxide, lithopone, titanium pigments, calcium pigments, gypsum, terra alba, plaster of Paris, barium pigments, and silica pigments.

American Society for Testing Materials, D 50-36; 1936. American Standards Assn., K44-1937. Methods of Chemical Analysis of Yellow, Orange, Red, and Brown Pigments Containing Iron and Manganese. Methods of test for Indian reds, red oxides, ochers, Venetian red, siennas, and umbers, for chemical composition.

American Society for Testing Materials, D 56-36; 1936. American Petroleum Institute Standard, 509-36. American Standards Assn., Z11.24-1936. Method of Test for Flash Point by Means of the Tag Closed Tester. For all mobile liquids flashing below 175° F., except for fuel oil which is preferable tested with the Pensky-Martens closed tester. Dimensions of tag closed tester, requirements for thermometers, procedure for average value of flash point, and variation for lacquer solvents or diluents of low flash point.

American Society for Testing Materials, D 126-36; 1936. American Standards Assn., K58-1941. Methods of Chemical Analysis of Yellow and Orange Pigments Containing Chromium Compounds, Blue Pigments, and Chrome Green. Includes preparation of sample, methods of chemical analysis of yellow and orange pigments, blue pigments, ultramarine blue, cobalt blue, sublimed blue, chrome green, and chrome oxide green.

American Society for Testing Materials, D 153-39; 1939. American Standards Assn., K41-1939. Methods of Test for Specific Gravity of Pigments. Description of apparatus and methods of procedure for—(a) routine testing of several samples simultaneously, (b) for tests requiring the highest accuracy, and (c) for rapid accurate testing of single samples.

American Society for Testing Materials, D 185-37; 1937. American Standards Assn., K42-1937. Methods of Test for Coarse Particles in Pigments, Pastes, and Paints. Describes apparatus and procedures for insoluble dry pigments, metallic aluminum and bronze powders, water-soluble pigments, pastes in oil or japan, mixed paints, ship-bottom paints containing resins and alcohol, and for cellulose ester lacquers.

American Society for Testing Materials, D 215-41; 1941. Methods of Chemical Analysis of White Linseed Oil Paints. Preparation of sample, reagents, water, volatile thinner, nature of thinner, percentage of pigment, percentage of nonvolatile vehicle, testing nonvolatile vehicle, and analysis of pigment.

American Society for Testing Materials, D 278-31; 1931. American Standards Assn., K51-1941. Method of Test for Alkalinity or Acidity of Pigments. Describes methyl orange test for water filtered through pigment.

American Society for Testing Materials, D 279-31; 1931. American Standards Assn., K52-1941. Methods of Test for Bleeding of Pigments. Covers procedure for dry pigments used in cellulose ester lacquers, for dry pigments used in oil or oleo-resinous paints and enamels, for pastes in oil, and for pastes in japan.

American Society for Testing Materials, D 280-33; 1933. American Standards Assn., K53-1941. Method of Test for Hydroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments. Covers method for pigments which decompose at 110° C., and for pigments which do not decompose at 110° C. Description of apparatus and outlines of procedure.

American Society for Testing Materials, D 281-31; 1931. American Standards Assn., K54-1941. Method of Test for Oil Absorption of Pigments. To determine the least quantity of raw linseed oil which will "wet" the pigment to produce a stiff putty-like paste.

American Society for Testing Materials, D 283-39; 1939. Method of Chemical Analysis of Dry Cuprous Oxide. Covers preparation of sample, determination of total copper, metallic copper, and cuprous oxide.

American Society for Testing Materials, D 307-44; 1944. Method of Test for Spectral Characteristics and Color of Objects and Materials. Description of apparatus required, standard reflecting surface, illumination, calibrations, and method of procedure.

American Society for Testing Materials, D 332-36; 1936. American Standards Assn., K56-1941. Method of Test for Tinting Strength of White Pigments. Covers requirements as to apparatus, materials, and procedures for white pigments, pastes, and optional method for pigments varying greatly in tinting strength by comparison with agreed standards; formulas for computing tinting strength.

American Society for Testing Materials, D 333-40; 1940. Methods of Testing Nitrocellulose Clear Lacquers and Lacquer Enamels. Method of procedure for the determination of weight, drying time, gloss, homogeneity, print test, outdoor exposure, nonvolatile matter, consistency, and apparatus assembly required.

American Society for Testing Materials, D 344-39; 1939. Method of Test for Relative Dry Hiding Power of Paints. For comparison and for quantitative determination of relative dry hiding powers of paints. Describes apparatus, materials, method of procedure, and optional procedure with formula for calculation of the hiding power.

American Society for Testing Materials, D 387-36; 1936. American Standards Assn., K57-1941. Method of Test for Mass Color and Tinting Strength of Color Pigments. For dry colors either in form of dry pigments or of pastes in oil or japan; requirements for apparatus, mass color procedure, tinting strength procedures for color pigments and for pastes.

American Society for Testing Materials, D 406-39; 1939. Method of Test for Relative Dry Hiding Power of White Pigments in a Linseed Oil Vehicle. For a comparison of a standard and sample of same type of pigment and also for quantitative difference in two pigments of the same type. Describes apparatus, materials, test for relative dry hiding power, and procedure for determining the quantitative differences in hiding power.

American Society for Testing Materials, D 444-39; 1939. Methods of Chemical Analysis of Zinc Yellow Pigment (Zinc Chromate Yellow). Includes preparation of sample, determination of moisture, chromium, total alkali metals, sodium, calcium, and ammonia.

American Society for Testing Materials, D 479-40; 1940. Method of Test for Reactivity of Paint Liquids. For the determination of reactivity between paint liquids and zinc oxide. Requirements as to apparatus and reagents, outline of procedure for test, and method of grading.

American Society for Testing Materials, D 523-44 T; 1944. Tentative Method of Test for Specular Gloss of Paint Finishes. Describes two procedures for measuring specular gloss of paint finishes as follows: Procedure A may be used for the classification of any surface regardless of the presence of some texture and may also be used for measurement of eggshell and flat finishes. Procedure B is applicable only to surfaces which are free from macroscopic structure or texture and is intended for measurement of specular gloss over a wider gloss range than procedure A. Definition, apparatus, method of measurement, specular gloss standards, preparation and measurement of samples, report, definitions of five types of gloss not involved in present method of test, and discussion of definitions.

American Society for Testing Materials, D 555-41; 1941. Methods of Testing Drying Oils. For drying oils used in paints and varnishes. Reagents, preparation of sample, specific gravity; acid number of linseed oil, raw tung oil, perilla oil, and raw soybean oil; saponification number, unsaponifiable matter, iodine number Wijs and Hanus, loss on heating, appearance, color, foots; and heated and chilled oil tests, heating test, quality test; refractive index, time of drying on glass, ash, lead, and matter insoluble in chloroform.

American Society for Testing Materials, D 562-44; 1944. Method of Test for Consistency of Exterior House Paints and Enamel-Type Paints. For determining the consistency expressed in terms of the weight required to produce a specified speed in a Stormer viscosimeter.

American Society for Testing Materials, D 564-43; 1943. Methods of Testing Liquid Driers. To be applied to driers for use in paints and varnishes. Gives requirements for conditioning, physical tests, chemical analysis, zinc, and iron.

American Society for Testing Materials, D 609-41 T; 1941. Tentative Method for Preparation of Steel Panels for Exposure Tests of Enamels for Exterior Service. Covers two procedures for the preparation of steel panels for exposure tests of enamels for exterior service. Test panels, preparation of panel surface, and application of finishing material.

American Society for Testing Materials, D 610-43; 1943. Method of Evaluating Degree of Resistance to Rusting Obtained With Paint on Iron or Steel Surfaces. The photographic reference standards included in this method are representative of degrees of resistance to rusting obtained from paint on iron or steel surfaces. They are to be used for comparative purposes and are not intended to have a direct relationship to a decision regarding painting requirements. Covers types of rusting and use of photographic reference standards.

American Society for Testing Materials, D 658-44; 1944. Method of Test for Abrasion Resistance of Organic Coatings With the Air Blast Abrasion Tester. Covers coatings applied to flat sheet metal of uniform surface texture.

American Society for Testing Materials, D 659-44; 1944. Method of Evaluating Degree of Resistance to Chalking of Exterior Paints of the Linseed-Oil Type. Chalking is defined as that phenomenon manifested in paint films by the presence of loose removable powder, evolved from the film itself, at or just beneath the surface.

American Society for Testing Materials, D 660-44; 1944. Method of Evaluating Degree of Resistance to Checking of Exterior Paints of the Linseed-Oil Type. Checking is defined as that phenomenon manifested in paint films by slight breaks in the film that do not penetrate to the underlying surface.

American Society for Testing Materials, D 661-44; 1944. Method of Evaluating Degree of Resistance to Cracking of Exterior Paints of the Linseed-Oil Type. Cracking is defined as that phenomenon manifested in paint films by a break extending through to the surface painted.

American Society for Testing Materials, D 662-44; 1944. Method of Evaluating Degree of Resistance to Erosion of Exterior Paints of the Linseed-Oil Type. Erosion is that phenomenon manifested in paint films by the wearing away of the finish to expose the substrate.

American Society for Testing Materials, D 711-43T; 1943. Tentative Method of Test for Dry to No-Pick-Up Time of Traffic Paint. Describes a laboratory test to determine the length of drying time after application for no-pick-up of traffic or pavement-marking paint by the tire of an automobile. Gives requirements for apparatus and procedure.

American Society for Testing Materials, D 712-43T; 1943. Tentative Method of Test for Light Sensitivity of Traffic Paint. Intended for determining the color change produced by sunlight on paint material intended for use as traffic or pavement-marking paint. Covers preparation of test panels and procedure.

American Society for Testing Materials, D 713-43T; 1943. Tentative Method of Conducting Road Service Tests on Traffic Paint. Intended for determining the relative values of service of traffic or pavement-marking paints under actual road conditions. Covers type of location of road surface for tests, conditions at time of application, consistency of paint samples, method and rate of application, and observations.

American Society for Testing Materials, D 714-43T; 1943. Tentative Method for Evaluating the Degree of Resistance to Blistering of Organic Coatings on Metal When Subjected to Immersion or Other Tests Involving Exposure to Moisture or Liquids. The photographic reference standards included in this method are representative of different sizes of blisters that may develop on paint systems on iron, steel, or other metal surfaces when subjected to immersion tests. Covers types of blistering and use of photographic reference standards.

American Society for Testing Materials, D 715-43T; 1943. Tentative Methods of Analysis of Barium Sulfate Pigments. These methods cover the procedures for the chemical analysis of barium sulfate pigments. Includes procedure for barium sulfate, ferric oxide, hydrogen ion concentration,matter soluble in water, moisture and other volatile matter, coarse particles, and free silica.

American Society for Testing Materials, D 716-43T; 1943. Tentative Methods of Analysis of Mica Pigment. These methods cover the procedures for the chemical analysis of mica pigments. Includes procedure for apparent density, moisture and other volatile matter, grit, coarse particles, and color.

American Society for Testing Materials, D 717-43T; 1943. Tentative Methods of Analysis of Magnesium Silicate Pigment. These methods cover the procedures for the chemical analysis of magnesium silicate pigment. Includes procedure for silicon dioxide, magnesium oxide, loss on ignition, moisture and other volatile matter, coarse particles, and color.

American Society for Testing Materials, D 718-43T; 1943. Tentative Methods of Analysis of Aluminum Silicate Pigment. These methods cover the procedures for the chemical analysis of aluminum silicate pigment. Includes procedure for silicon dioxide, aluminum oxide, loss on ignition, moisture and other volatile matter, coarse particles, and color.

American Society for Testing Materials, D 719-43T; 1943. Tentative Methods of Analysis of Diatomaceous Silica Pigment. These methods cover the procedures for the chemical analysis of diatomaceous silica pigment. Includes procedure for loss on ignition, matter soluble in hydrochloric acid, moisture and other volatile matter, volume of settling in petroleum spirits, coarse particles, and color.

American Society for Testing Materials, D 771-44 T; 1944. Tentative Method of Test for Daylight 45 Degree, 0 Degree Apparent Reflection of Paint Finishes. Covers scope, definition, apparatus, standards, preparation of sample, and report.

American Society for Testing Materials, D 772-44 T; 1944. Tentative Method of Evaluating Degree of Resistance to Flaking (Scaling) of Exterior Paints of the Linseed-Oil Type. Covers scope, definition, types of flaking (scaling), and use of photographic reference standards.

American Society for Testing Materials, E 41-42 T; 1942. Tentative Definitions With Procedures Relating to Conditioning and Weathering. Intended to apply to all cases where combinations of atmospheric influences are an essential part of materials testing. Definitions, relative humidity determination, room temperature determination, and test in standard laboratory atmosphere.

American Society for Testing Materials, E 42-42 T; 1942. Tentative Recommended Practice for Characteristics of Standard Carbon Arc Accelerated Weathering Unit. The characteristics recommended cover those points of fundamental importance that will provide an acceptable accelerated weathering unit for many purposes, and at the same time permit the development of detailed and specific cycles needed for the obtaining of particular data and falling within the general structure of this recommended practice.

American Society for Testing Materials, ES-35; 1944. Emergency Method of Test for Changes in Protective Properties of Organic Coatings on Steel Surfaces When Subjected to Immersion. Intended for use in determining the resistance to failure of organic coatings when immersed in specified test liquids. Gives apparatus, test specimens, preparation of specimens, coating of specimens, and procedure.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Paints, Varnishes, and Constituent Materials. Includes white linseed oil paints—same (except editing for form) as Specification D215-29 of the American Society for Testing Materials; nonvolatile vehicle—for mineral oil and other unsaponifiable matter, iodine number of fatty acids, rosin, pigment, and specific gravity; single pigments (basic carbonate of lead, basic sulfate of lead, zinc oxide, lithopone, and titanium); mixed or composite pigments—for moisture, loss on ignition, insoluble matter, total lead and antimony, antimony oxide, soluble barium, alumina, total zinc, soluble calcium, soluble magnesium, total soluble sulfur compounds, soluble sulfate, sulfide sulfur, sulfur dioxide, and matter soluble in water, and recommendations for calculations of component pigments; oleoresinous varnishes—for appearance, color, nonvolatile matter, elasticity or toughness, flash point, viscosity, and water; raw linseed oil—specific gravity, iodine absorption number, saponification number, acid number, foots, loss on heating 105°-110°, and color; and boiled linseed oil—specific gravity, iodine absorption number, saponification number, acid number, loss on heating 105°-110°, time of drying on glass, ash, lead, and appearance.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Flash Point Test-Tag Closed Tester. For determining the flash point of mobile liquids flashing below 175° F. and lacquer solvents or diluents of low flash points. Covers apparatus, procedure, repeat tests, average value of flash point, and correction for barometric pressure.

U. S. Gov., Army-Navy Aeronautical Specification AN-QQ-S-91; 1938. Salt-Spray Corrosion Test; Process for.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-C-516-4; 1944. Coatings; Protective, Organic (for Aircraft); General Specifications (Methods for Sampling and Testing).

U. S. Gov., Federal Specification TT-P-141a; 1944. Paint, Varnish, Lacquer, and Related Materials. General Specifications for Sampling and Test Method. Covers inspection, and sampling, preparation of test panels and application of films, package stability tests, physical tests of materials, chemical tests of materials, properties of coated panels, and analytical tests of ingredients.

840.6 PAINTING AND PROTECTIVE COATING EQUIPMENT

American Hospital Assn., 34-133. Paint Sprayers (Outfits). Covers general and special purpose types.

Based on U. S. Gov., Navy Dept., Specifications 41 S 35.

Society of Automotive Engineers. Aeronautical Standard 11a; 1945. Spray Equipment, Corrosion-Preventive Compound. For Applying corrosion-preventive compound AMS-3072 to aircraft engines. Gives requirements for equipment, sprayer extension, nozzle, and operation.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-8; 1942. Metal Spraying; Process for.

U. S. Gov., Navy Dept. Specification 41P31; 1942. Pots; Paint.

U. S. Gov., Navy Dept. Specification 41S35d; 1942. Sprayers; Paint (Outfits).

U. S. Gov., Navy Dept. Specification 41S38d; 1942. Sprayers, Dope; Guns and Accessories, Aircraft Use.

U. S. Gov., Navy Dept. Specification 41S41a; 1939. Sprayers, Metal; Guns and Accessories.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 39-7; 1943. Sprayer; Paint, Pneumatic Pressure Type, Trailer Mounted.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 39-8; 1943. Agitator; Paint, Motor-Driven, 1/2 H.P., 110 Volt, 60 Cycle, AC, with 50-Gal. Mixing Tank.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 29-10; 1923. Strainer; Paint.

U. S. Gov., Veterans Administration. Specification VA-M-43b; 1937. Portable Electric Spray Painting Outfit.

U. S. Gov., Veterans Administration. Specification VA-M-44; 1936. 1 H.P. Portable Electric Spray Painting Outfit.

U. S. Gov., Veterans Administration. Specification VA-M-51b; 1938. 'Automobile Paint Finishing Outfit.

U. S. Gov., Veterans Administration. Specification VA-M-180; 1935. Paint Spray Outfit (Automotive).

U. S. Gov., Veterans Administration. Specification VA-M-209; 1936. Paint Spray Gun (Only) Automotive.

U. S. Gov., Veterans Administration. Specification VA-MC-42a; 1941. 1/2 H.P. Portable Electric Spray Painting Outfit.

840.9 MISCELLANEOUS REQUIREMENTS FOR PAINTS

American Society for Testing Materials, D 358-44 T; 1944. Tentative Specifications for Wood To Be Used as Panels in Weathering Tests of Paints and Varnishes. For exterior paints and other materials for similar purpose, either outdoor or accelerated laboratory tests, and for uses of each specie. Includes Western red cedar, white pine, and Southern yellow pine.

References.—Lime for use in manufacture of varnish, *see* 517.2.

841. MINERAL PIGMENTS, DRY AND PASTE

841.1 ASBESTINE PIGMENTS (MAGNESIUM SILICATE)

841.2 BARYTES PIGMENTS

American Society for Testing Materials, D 602-42; 1942. Barium Sulfate Pigments. Covers the barium sulfate pigments commercially known as barytes and blanc fixe. Composition and properties, number of tests, and methods of testing.

841.3 GRAPHITE PIGMENTS

841.4 IRON OXIDE PIGMENTS

841.41 Iron Oxide, Red Pigments

American Society for Testing Materials, D 84-43T; 1943. American Assn. of State Highway Officials, M 129. Tentative Specifications for Red and Brown Iron Oxide Pigments. Covers three classes and two types. Gives requirements for total iron oxide, moisture and other volatile matter, sulfur, matter soluble in water, organic coloring matter, and coarse particles for dry pigments; coarse particles and skins, and moisture and other volatile matter for paste in oil; number of tests and methods of testing.

U. S. Gov., Federal Specification TT-I-511a; 1944. Indian-Red and Bright-Red (Iron-Oxide); Dry (Paint-Pigments). Covers one grade and two types—(I) Indian red and (II) bright red. Gives requirements for iron oxide, coarse particles, lime, moisture and other volatile matter, organic colors or lakes, matter soluble in water, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-M-381; 1944. Mineral-Red (Iron-Oxide), Natural; Dry (Paint Pigments). Covers one grade and one type. Gives detail requirements for coarse particles, iron oxide, sulfates, moisture and other volatile matter, organic colors, matter soluble in water, and mass color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Definitions, methods of testing pigments, *see* 840.3, 840.5.

841.42 Iron Oxide, Brown Pigments

American Society for Testing Materials, D 84-43T; 1943. American Assn. of State Highway Officials, M 129. Tentative Specification for Red and Brown Iron Oxide Pigments. Covers three classes and two types. Gives requirements for total iron oxide, moisture and other volatile matter, sulfur, matter soluble in water, organic coloring matter, and coarse particles for dry pigments; coarse particles and skins, and moisture and other volatile matter for paste in oil; number of tests and methods of testing.

U. S. Gov., Federal Specification TT-I-702; 1944. Iron Oxide; Brown, Synthetic, Dry (Paint Pigment). Covers the grade of pigment commercially known as synthetic brown iron oxide. Gives requirements for total ferro-ferric oxide of iron, loss on ignition, moisture and other volatile matter, water-soluble matter, organic colors or lakes, extenders and adulterants, coarse particles, and mass color and character of tint; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Brown pigments, *see* 841.41.

841.43 Iron Oxide, Yellow Pigments

American Society for Testing Materials, D 768-44 T; 1944. Tentative Specifications for Yellow Iron Oxide; Hydrated. Covers the pigment commercially known as yellow iron oxide, hydrated. Gives composition and properties, number of tests, and methods of testing.

U. S. Gov., Federal Specification TT-Y-216; 1943. Amendment 1; 1944. Yellow-Iron-Oxide; Hydrated, Synthetic, Dry (Paint Pigment). Covers the grade of pigment commercially known as synthetic hydrated yellow iron oxide, suitable for use in paints, enamels, lacquers, and similar products. Shall be a manufactured yellow iron oxide obtained by chemical reaction. Gives requirements for chemical composition and the mass color and character of the tint; methods of sampling, inspection, and tests; and packaging, packing, and marking.

841.44 Iron Oxide, Black Pigments

American Society for Testing Materials, D 769-44 T; 1944. Tentative Specifications for Black Synthetic Iron Oxide. Covers the pigment commercially known as black synthetic iron oxide. Gives composition and properties, number of tests; and methods of testing.

U. S. Gov., Federal Specification TT-I-698; 1944. Iron Oxide; Black, Synthetic, Dry (Paint Pigment). Covers the grade of pigment commercially known as synthetic black iron oxide. Gives requirements for total ferro-ferric oxide of iron, ferrous oxide, moisture and other volatile matter, water-soluble matter, organic colors or lakes, extenders and adulterants, coarse particles, and mass color and character of tint; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

841.49 Miscellaneous Red, Brown, and Maroon Pigments

National Assn. of Purchasing Agents, Handbook of Commodity Data Sheets, Volume 2; 1944. Pigments; Iron (Iron Oxide, Red Iron Oxide, Yellow Iron Oxide, Ocher, Persian Red, Umber, Sienna). Covers definition, derivation, uses, grades, and packing.

U. S. Gov., Federal Specification TT-M-251; 1944. Metallic-Brown; Dry (Paint-Pigment). Covers one grade and one type of dry metallic brown paint pigment. Gives requirements for coarse particles, iron oxide, sulfates, moisture and other volatile matter, organic colors, matter soluble in water, and mass color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Ocher pigments of iron oxide, *see* 841.5.

841.5 Ocher (Pigment)

American Society for Testing Materials, D 85-41; 1941. Ocher. Covers ferrous earthy pigments in dry or paste form, composition of dry ingredients, paste made by thoroughly grinding pigment with linseed oil or grinding japan, mass color, character of tint, number of tests, and methods of test.

U. S. Gov., Federal Specification TT-O-121; 1944. Ocher; Yellow, Dry (Paint-Pigment). Covers one grade and type of hydrated oxide of iron permeating a siliceous base and shall be in the form of a soft, dry powder. Gives requirements for coarse particles, iron oxide, lime, lead chromate, organic colors, moisture, tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Definitions, methods of testing pigments, *see* 840.3, 840.5.

841.6 SIENNA (PIGMENT)

American Society for Testing Materials, D 765-44 T; 1944. Tentative Specifications for Raw Sienna. Covers the pigment commercially known as raw sienna. Gives composition and properties, number of tests, and methods of testing.

American Society for Testing Materials, D 766-44 T; 1944. Tentative Specifications for Burnt Sienna. Covers the pigment commercially known as burnt sienna. Gives composition and properties, number of tests, and methods of testing.

U. S. Gov., Federal Specification TT-S-346; 1944. Sienna; Burnt and Raw, Dry (Paint-Pigments). Covers one grade and two types—(I) raw and (II) burnt. Gives detail requirements for iron oxide, calcium compounds, organic colors, coarse particles, moisture, and mass color for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

841.7 UMBER (PIGMENT)

American Society for Testing Materials, D 763-44 T; 1944. Tentative Specifications for Raw Umber. Covers the pigment commercially known as raw umber. Gives composition and properties, number of tests, and methods of testing.

American Society for Testing Materials, D 764-44 T; 1944. Tentative Specifications for Burnt Umber. Covers the pigment commercially known as burnt umber. Gives composition and properties, number of tests, and methods of testing.

U. S. Gov., Federal Specification TT-U-481; 1944. Umber; Burnt and Raw, Dry (Paint-Pigments). Covers one grade and two types—(I) raw and (II) burnt. Gives detail requirements for iron oxide, calcium compounds, coarse particles, moisture, and mass color for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

841.8 WHITING OR PARIS WHITE

U. S. Gov., Navy Dept. Specification 52Wle; 1942. Whiting.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-33; 1944. Pigment; Whiting (Calcium Carbonate). Covers one type and one grade of a pigment for use in ready mixed paint. Gives requirements for material, workmanship, form, composition, specific gravity, coarse particles, color, and oil absorption, inspection, sampling, and methods of test; and packaging and marking.

References.—Ceramic whiting, calcium carbonate, *see* 546, 833.3.

842. CHEMICAL PIGMENTS (DRY AND PASTE)

842.1 BLANC FIXE AND TITANIUM OXIDE (PIGMENTS)

American Society for Testing Materials, D 476-41; 1941. American Standards Assn., K45-1941. Titanium

Dioxide Pigments. Includes titanium dioxide, titanium-barium, titanium-calcium, and titanium-magnesium pigments. Composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 602-42; 1942. Barium Sulfate Pigments. Covers the barium sulfate pigments commercially known as barytes and blanc fixe. Composition and properties, number of tests, and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Titanium Dioxide. Covers definition, constants, manufacture, grades, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Titanium Pigments. Covers: (I) Titanium dioxide—definition, physical properties, chemical properties, solubility, grades, derivation, substitutes, containers, uses, and ordering instructions; (II) titanium-barium—definition, constants, solubility, derivation, substitutes, containers, uses, and ordering instructions; (III) titanium-calcium—definition, constants, solubility, derivation, substitutes, containers, uses, and ordering instructions; (IV) lead titanate—definition, constants, chemical formula, solubility, derivation, substitutes, containers, and uses; (V) titanium-magnesium (titanium silicate), definition, constants, solubility, derivation, substitutes, containers, uses, and ordering instructions.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Blanc Fixe (Barium Sulphate). Covers definition, constants, solubility, derivation, uses, grades and forms, containers, shipping, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Lead Titanate. Covers definition, constants, impurities, derivation, characteristics, uses, grades, and substitutes.

Technical Assn. of the Pulp and Paper Industry. Determiniation of Titanium Dioxide. Tentative Standard T 627 m-43; 1943. Deals with the determination of titantium dioxide in raw materials such as pigments, fillers, and minerals, as well as in various stages of mill process. Covers volumetric method including apparatus, reagents, preparation of sample, and procedure; and colorimetric method including reagents, procedure, interfering elements, and report.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-T-436a; 1943. Titanium Oxide; Chalk-Resisting, Dry (Pigment).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C 398 and Supplement, 1944. Standard Samples. Titanium Dioxide, Sample 154. This sample is prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar material.

U. S. Gov., Federal Specification TT-T-425; 1944. Amendment 1; 1944. Titanium Dioxide; Dry, Paint-Pigment. Covers one grade of soft, dry powder in three types—(I) free chalking, anatase; (II) semi-chalking in two classes—(A) antimony-aluminum treated, anatase, and (B) aluminum treated, rutile; and (III) chalk-resisting, rutile, in three classes—(A) zinc treated, (B) silicon-aluminum treated, and (C) silicon-aluminum-zinc treated. Gives requirements for composition, specific gravity, oil absorption, color, water solubility, tinting strength, hydrogen ion concentration, moisture, and chalk resistance; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52B9c; 1924. Blanc Fixe; Dry and Paste.

U. S. Gov., Navy Dept. Specification 52T10a; 1945. Titanium-Calcium Pigment.

U S. Gov., U. S. Maritime Commission. Specification 52-MC-9; 1942. Pigment; Titanium Dioxide; Rutile, Chalk-Resisting. Covers one type and grade of dry pigment. Gives requirements for coarse particles, chemical composition, specific gravity, hiding power, color, tinting strength, hydrogen ion concentration; inspection, sampling, and methods of test; and packaging and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-16; 1943. Pigment; Titanium-Calcium, Rutile. Covers one type and one grade of dry pigment. Gives requirements for coarse particles, chemical composition, specific gravity, hiding power, composition, color, and tinting strength; inspection, sampling, and methods of tests; packaging and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-19; 1943. Pigment; Titanium Dioxide, Rutile. Covers one type and grade of dry pigment. Gives requirements for coarse particles, chemical composition, specific gravity, hiding power, color, tinting strength, and hydrogen ion concentration; inspection, sampling, and methods of test; and packaging and marking.

References.—Titanium mixed pigments, *see* 842.87; Definitions of terms, *see* 840.3.

842.2 CHINESE, PRUSSIAN, OR BRONZE BLUE (PIGMENTS)

American Society for Testing Materials, D 261-41; 1941. American Assn. of State Highway Officials, M 131-42. American Standards Assn., K 29-1941. Prussian Blue. For pigment known commercially as Prussian blue, Chinese blue, or iron blue, in dry form or as paste in oil or in japan. Requirements for dry ingredients formed by reaction of solutions of iron salts with ferrocyanide or ferricyanide solutions, paste made by grinding pigment with linseed oil or by grinding in japan, mass color and character of tint, number of tests, and methods of test.

U. S. Gov., Federal Specification TT-I-677; 1944. Iron Blue; Dry (Paint-Pigment). Formerly designated "Prussian Blue." Covers one grade of iron blue (also called Chinese, Prussian, Milori, etc.) in one type only, a fine dry powder. Gives requirements for moisture and other volatile matter, total matter soluble in water, character of tint when diluted with zinc oxide, tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing and marking for shipment.

References.—Definitions of terms, methods of testing pigments, *see* 840.3, 840.5.

842.3 ULTRAMARINE BLUE (PIGMENTS)

American Society for Testing Materials, D 262-41; 1941. Ultramarine Blue. Covers the pigments commercially known as ultramarine blue, suitable for use in paints, enamels, lacquers, and similar products. The pigment may be purchased in the dry form or as a paste in oil or in japan. Composition and properties, number of tests, and methods of testing.

U. S. Gov., Federal Specification TT-U-450; 1944. Ultramarine Blue; Dry (Paint-Pigment). Covers the grade of pigment known commercially as ultramarine blue, in one grade only, the dry pigment. Gives requirements for coarse particles, moisture and other volatile matter, matter soluble in water, organic colors or lakes, tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Definitions of terms, *see* 840.3; methods of testing pigments, *see* 840.5.

842.4 CARBON BLACK, LAMPBLACK, BONE BLACK, ETC.

American Society for Testing Materials, D 209-41; 1941. American Standards Assn., K26-1941. Lampblack. For dry pigment made by burning oils or tars in a manner to form carbon or soot and for paste in oil or japan. Limiting percentages of ash, acetone extract, coarse particles; tone when diluted with zinc oxide for dry pigment, for paste in linseed oil, for paste in grinding in japan; number of tests, and methods of test.

American Society for Testing Materials, D 210-41; 1941. American Standards Assn., K36-1941. Bone Black. Covers the pigment commercially known as bone black, ivory black, or drop black. The pigment may be purchased in the dry form or as a paste in oil or in japan. Limiting percentages of ash, ash insoluble in acids; acetone extract, coarse particles; tone when diluted with zinc oxide for dry pigment; for paste in linseed oil and in grinding in japan; number of tests and methods of test.

American Society for Testing Materials, D 305-31; 1931. American Standards Assn., K55-1941. Method of Test for Acetone Extract in Dry Lampblack and Dry Bone Black. Covers arbitrary routine procedure for percentage of acetone extract.

American Society for Testing Materials, D 561-41; 1941. Carbon Black. Covers commercial pigment suitable for use in the manufacture of protective or decorative coatings. Number of tests and methods of testing.

Assn. of American Feed Control Officials. Definitions of Feedingstuffs, 1942. Bone Charcoal or Bone Black. Includes spent bone black, minimum percentage of phosphorus contained in product after charring bones in closed retort.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Bone Black (Animal Charcoal). Covers definition, constants, derivation and characteristics, grades, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Carbon Black (Gas Black, Channel Black). Covers definition, derivation, constants, uses, grades, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Lampblack. Covers definition, constants, derivation, uses, grades, containers, and substitutes.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-C-121; 1941. Carbon Black; Dry (Pigment).

U. S. Gov., Federal Specification TT-B-600; 1944. Bone Black; Dry (Paint-Pigment). Covers the grade of dry bone black also known as ivory black or drop black and shall be the product made by calcination of bones. Gives requirements for coarse particles, total ash, ash insoluble in acids, acetone extract, tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-C-120; 1944. Carbon Black; Dry (Paint-Pigment). Covers two forms—(I) powder and (II) pellets (dustless); and two classes—(A) high color and (B) standard all-purpose. Gives requirements for ash, acetone extract, coarse particles, moisture, organic dyes, mass color and character of tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-L-70; 1944. Lampblack; Dry (Paint-Pigment). Covers one grade of a fine dry powder made by burning oils or tars. Gives requirements for coarse particles, ash, acetone extract, tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52L7c; 1943. Lampblack; Dry.

References.—Other black pigments, *see* 842.81, 843.31; definitions, methods of testing pigments, *see* 840.3, 840.5.

842.5. CHROMIUM COLORS (PIGMENTS) (GREEN, YELLOW)

American Society for Testing Materials, D 211-43; 1943. American Standards Assn., K27.1; 1943. Chrome Yellow and Chrome Orange. For pigment known commercially as primrose chrome yellow, lemon chrome yellow, medium chrome yellow, light chrome orange, dark chrome orange, and orange chrome yellow. May be purchased in the dry form or as a paste in oil or in japan. Gives requirements for composition and properties, number of tests, and method of testing.

American Society for Testing Materials, D 212-41; 1941. American Assn. of State Highway Officials, M 130-42. Pure Chrome Green. Covers the pigment commercially known as pure chrome green. The pigment may be purchased in the dry form or as a paste in oil or in japan. A precipitated mixture of lead chromate and iron ferrocyanide and ferricyanide blue, with or without other insoluble compounds of lead. Composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 213-41; 1941. American Standards Assn., K28-1941. Reduced Chrome Green. Covers pigment known commercially as reduced chromium green, also as grinders green. May be purchased in the dry form or as a paste in oil or in japan. A mixture of lead chromate and iron ferrocyanide and ferricyanide blue, with or without other insoluble compounds of leads, precipitated on a base of barium sulfate or insoluble siliceous material. Composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 263-41; 1941. American Standards Assn., K37-1941. Chrome Oxide Green. Covers the pigment commercially known as chrome oxide green. The pigment may be purchased in the dry form or as a paste in oil. Composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 478-41; 1941. American Standards Assn., K50-1941. C. P. Zinc Yellow (Zinc Chromate). Covers pigment known commercially as chemically pure zinc yellow or zinc chromate, in dry or paste form. Composition and properties, number of tests, and methods of test.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-C-221-1; 1942. Chrome Green; Dry (Pigment), Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-L-116-1; 1942. Lead Chromate (Pigment).

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-Z-416-2; 1942. Zinc Yellow (Zinc Chromate); Dry (Pigment).

U. S. Gov., Federal Specification TT-C-235; 1944. Chrome Green; Pure, Dry (Paint-Pigment). Covers the grade of pure chrome green (blend of chrome yellow and iron blue) for use in paints and shall be supplied in one type only. Gives requirements for coarse particles, total matter soluble in water, moisture and other volatile matter, lead chromate, tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-C-290; 1944. Chrome Yellow and Chrome Orange; Dry (Paint-Pigments). Covers one grade and five types—(I) primrose chrome yellow, (II) lemon chrome yellow, (III) medium chrome yellow, (IV) light chrome orange, and (V) dark chrome orange. Gives requirements for total chromium, total matter soluble in water, total of all substances other than insoluble compounds of lead, volatile including moisture, coarse particles, organic colors or lakes, tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-C-306; 1944. Chromium Oxide Green; Dry (Paint-Pigment). Covers one grade and one type of a fine dry powder and shall be practically pure sesquioxide of chromium (Cr_2O_3). Gives requirements for total chromium, coarse particles, total matter soluble in water, moisture and other volatile matter, tint, and oil absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-Z-415; 1944. Zinc Yellow, Zinc Chromate; Dry (Paint-Pigment). Covers one grade and two types—(I) low chloride-sulfate and (II) regular. Gives requirements for material, chemical composition, specific gravity, coarse particles, oil absorption, acetic acid solubility, color, and lightfastness; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Definitions, methods of testing pigments, *see* 840.3, 840.5; green chromium pigments, *see* 842.85.

842.6 LEAD PIGMENTS

842.61 Blue-Lead Pigments

American Society for Testing Materials, D 405-41; 1941. American Standards Assn., K48-1941. Blue Lead; Basic Sulfate. Covers the pigment commercially known as blue lead, basic sulfate, suitable for use in paints. The pigment may be purchased in the dry form or as a paste in oil. Composition and properties, number of tests, and methods of test.

U. S. Gov., Federal Specification TT-B-486; 1934. Blue Lead; Basic Sulphate; Dry, and Paste-in-Oil. Covers two types—(A) dry pigment and (B) paste-in-oil. Gives requirements for lead sulphate, lead oxide, lead sulphite, zinc oxide, carbon, and coarse particles in dry pigment; pigment, linseed oil, volatile matter, and coarse particles in paste-in-oil; methods of sampling, testing, and basis of purchase; and requirements for packaging, packing, and marking.

842.62 Litharge Pigments

U. S. Gov., Navy Dept. Specification 52L10b; 1942. Litharge; Dry.

842.63 Red-Lead Pigments

American Assn. of State Highway Officials, M71-42. Standard Specifications for Red Lead (Dry and Paste-in-Oil) and Paint Made Therefrom. Gives scope, general requirements, dry pigment, paste-in-oil, paint, packing and marking, and methods of analysis.

American Society for Testing Materials, D 49-44; 1944. American Standards Assn., K16.1-1944. Methods of Chemical Analysis of Dry Red Lead. Covers treatment of sample and procedure for the determination of moisture, organic color, total lead and insoluble matter, lead peroxide and true red lead, zinc, matter soluble in water, total silica, carbon dioxide, soluble sulfates, and iron oxide.

American Society for Testing Materials, D 83-41; 1941. American Standards Assn., K24-1941. Red Lead. Cover three grades of red lead pigment in paste or dry form for 85, 95, and 97 percent grades, total impurities allowed, lead monoxide, coarse particles and test mixture for properties of dry pigment, formula for mixture of paste in linseed oil, number of tests, and methods of test.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Red Lead. Covers definition, constants, derivation, grades, specifications, containers, uses, and substitutes.

U. S. Gov., Federal Specification TT-R-191a; 1938. Red Lead; Dry and Paste-In-Oil. Covers two types—(I) dry (in three grades—85, 95, and 97 percent) and (II) paste-in-oil (in two grades—95 and 97 percent). Gives requirements for true red lead, total impurities, lead monoxide, and coarse particles in dry pigment; and pigment, linseed oil, volatile matter, and coarse particles in paste; methods of sampling and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.356; 1939. Paint; Glyceryl Phthalate, Marine, Exterior, Basic Lead Chromate-Red Lead-Zinc Oxide. Shall be free from toxic ingredients and of one type and grade. For use as a priming coat for ferrous metal surfaces. Gives chemical composition of pigment and vehicle; details of paint including weight, coarse particles and skins, odor, flash point, moisture, working and drying properties, gloss, water resistance, and gasoline resistance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.358; 1939. Paint; Glyceryl Phthalate, Marine, Exterior, Red-Lead. Shall be of one type and grade, free from toxic ingredients. Intended for use as a priming coat for ferrous metal surfaces. Gives chemical composition of pigment and vehicle; details of paint including weight, coarse particles and skins, odor, flash point, moisture, working and drying properties, gloss, gasoline resistance, and moisture impedance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Definitions, methods of testing pigments, *see* 840.3, 840.5.

842.64 White-Lead Pigments

American Society for Testing Materials, D 81-43; 1943. American Assn. of State Highway Officials, M 122. American Standards Assn., K23.1; 1943. Basic Carbonate White Lead. Covers the material commercially known as basic carbonate white lead used as a pigment and in putty. The pigment may be purchased in the dry form or as a paste in oil. Gives requirements for composition and properties, number of tests, and methods of testing.

American Society for Testing Materials, D 82-44; 1944. American Assn. of State Highway Officials, M123. American Standards Assn., K47.1; 1944. Basic Sulfate White Lead. Covers the pigment commercially known as basic sulfate white lead. The pigment may be purchased in the dry form or as a paste in oil. Gives composition and properties, number of tests, and methods of test.

U. S. Gov., Federal Specification TT-W-251a; 1934. White Lead; Basic Carbonate, Dry, Paste-in-Oil, and Semipaste Containing Volatile Thinner. Covers three types—(A) dry pigment, (B) paste in oil, and (C) semipaste containing volatile thinner. Gives requirements for composition and color of each type; methods of sampling and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification TT-W-261a; 1937. White Lead, Basic Sulphate; Dry and Paste-in-Oil. Covers grade for use in paints in two types—(I) dry pigment and (II) paste-in-oil. Gives requirements for coarse particles, lead oxide, zinc oxide, and total impurities in dry pigment; and pigment, linseed oil, volatile matter, and coarse particles in paste-in-oil; methods of inspection and tests; and requirements for packaging, packing, and marking.

References.—Other white lead pigments, *see* 842.87; definitions, methods of testing pigments, *see* 840.3, 840.5.

842.69 Miscellaneous Lead Pigments

American Society for Testing Materials, D 606-42; 1942. Lead Titanate. Covers the pigment commercially known as lead titanate. Composition and properties, number of tests, and methods of testing.

References.—Lead chromate pigments, *see* 842.5; leaded zinc oxide pigments, *see* 842.7; pigments according to color, *see* 842.8.

842.7 ZINC OXIDES AND ZINC SULPHIDES (PIGMENTS)

American Society for Testing Materials, D 79-44; 1944. American Assn. of State Highway Officials, M 124. American Standards Assn., K22.1, 1944. Zinc Oxide. Covers the pigments commercially known as "zinc white" or zinc oxide. The pigment may be purchased in the dry form or as a paste in oil. Gives composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 80-41; 1941. Leaded Zinc Oxide. Covers the pigment commercially known as leaded zinc oxide. The pigment may be purchased in the dry form or as a paste in oil. Composition and properties, number of tests, and methods of testing.

American Society for Testing Materials, D 477-41; 1941. Zinc Sulfide Pigments. Includes commercially pure zinc sulfide, zinc sulfide-barium pigment, and zinc sulfide-magnesium pigment, lithopone, and titanated lithopone. Composition and properties, number of tests, and methods of test.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Lithopone. Covers definition, constants, derivation, uses, purity, forms available, and grades.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Zinc Oxide. Covers definition, constants, uses, properties, containers, specifications, and ordering instructions; also definition, properties, uses, purity, containers, and grades for leaded zinc oxide.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Zinc Sulphide. Covers definition, constants, derivation, uses, purity, forms available, and grades.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-Z-416-2; 1942. Zinc Yellow (Zinc Chromate); Dry (Pigment).

U. S. Gov., Federal Specification TT-L-426; 1944. Lithopone; Dry (Paint-Pigment). Covers processed lithopone (zinc sulfide pigment) in one type only—a soft, dry powder. Gives requirements for chemical composition, fineness, mass color and tinting strength, oil absorption, reflectivity, and light resistance; methods of sampling, inspection, and testing; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-Z-301; 1931. Zinc Oxide; Dry and Paste-in-Oil. Covers two grades—

American process, made directly from the ore; and French process, made from spelter. Gives requirements for composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-TT-Z-301; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for iodine number on the fatty acids recovered from the vehicle.

U. S. Gov., Federal Specification TT-Z-321; 1931. Zinc Oxide; Leaded, Dry and Paste-in-Oil. Covers two grades—high-leaded and low-leaded. Gives detail requirements for zinc oxide, water soluble salts, and total impurities in dry pigment; pigment, linseed oil, coarse particles, and volatile matter in paste; methods of sampling, testing, and basis of purchase; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification TT-Z-415; 1944. Zinc Yellow, Zinc Chromate; Dry Paint Pigment. Covers one grade and two types—(I) low chloride-sulfate and (II) regular. Gives requirements for material, chemical composition, specific gravity, coarse particles, oil absorption, acetic acid solubility, color, and lightfastness; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52Z3e; 1941. Zinc-Dust.

U. S. Gov., Navy Dept. Specification 52Z5; 1939. Zinc Yellow (Zinc Chromate).

U. S. Gov., Navy Dept. Specification 52Z7; 1943. Zinc Oxide.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-98; 1941. Zinc Oxide.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-8; 1942. Pigment; Oxide, Acicular. Covers one type and grade of dry pigment. Gives requirements for composition, coarse particles, oil absorption, microscopic appearance, and color; inspection, sampling, and methods of test; and packaging and marking.

References.—Definitions, methods of testing pigments, *see* 840.3-840.5; other zinc pigments, *see* 842.87.

842.8 MISCELLANEOUS PIGMENTS, DRY AND PASTE, CLASSIFIED BY COLOR

842.81 Black and Gray Pigments

References.—Specifications and methods of test for lampblack and bone black pigments, *see* 842.4; definitions, methods of testing pigments, *see* 840.3, 840.5.

842.82 Blue Pigments

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-I-676; 1941. Iron Blue; Dry.

U. S. Gov., Federal Specification TT-C-610; 1944. Copper-Phthalocyanine Blue; Dry, Paint Pigment. Covers one grade of a dry powdered pigment in two types—(I) toner type and (II) resinated or benzoated type. Gives requirements for material, composition, specific gravity, water solubility, oil absorption, color, lightfastness, and tests for identity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

842.83 Brown Pigments

References.—Iron oxide brown pigments, *see* 841.41.

842.84 Bluff, Drab, and Slate Pigments

842.85 Green and Olive Pigments

U. S. Gov., Navy Dept. Specification 52P55; 1945. Paint; Outside, Haze-Green (Formula No.5HG).

References.—Chromium pigments, *see* 842.5; definitions, methods of testing pigments, *see* 840.3, 840.6.

842.86 Red Pigments

American Society for Testing Materials, D 264-41; 1941. American Standards Assn., K31-1941. Reduced Para Red. Cover the red pigment commercially known as reduced para red. The pigment may be purchased in the dry form or as a paste in oil or in japan. Composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 475-41; 1941. American Standards Assn., K49-1941. C. P. Para Red Toner. Cover red pigment known commercially and "chemically pure" para red toner in dry form or paste in oil. Composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 656-43; 1943. C. P. Toluidine Toner. Covers the red pigment commercially known as "chemically pure" toluidine toner. The pigment may be in the dry form or in a paste in oil. Gives requirements for composition and properties, number of tests, and methods of testing.

American Society for Testing Materials, D 767-44 T; 1944. Tentative Specifications for Venetian Red. Covers the pigment commercially known as venetian red. Gives composition and properties, number of tests, and methods of testing.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-T-561-1; 1942. Toluidine Red; Dry (Pigment).

U. S. Gov., Federal Specification TT-T 562; 1944. Toluidine-Red Toner; Dry (Paint-Pigment). Covers one grade and type of a soft, dry powder. Gives requirements for coarse particles, ash, moisture and other volatile matter, paranitraniline red, and solubility in chloroform; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-V-226; 1944. Venetian Red; Dry (Paint-Pigment). Covers one grade and type. Gives requirements for ferris oxide, coarse particles, moisture and other volatile matter, organic coloring matter, and mass color and character of tint; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52T6b; 1944. Toluidine-Red Toner; Dry.

References.—Definitions, methods of testing pigments, *see* 840.3, 830.5; iron oxide pigments, red, *see* 841.41; red lead pigments, *see* 842.63.

842.87 White Pigments

American Society for Testing Materials, D 520-41; 1941. Zinc Dust (Metallic Zinc Powder). For use as pigment in paints. Composition and properties, number of tests, and methods of test.

References.—Whiting, *see* 841.8; other titanium, white lead, and zinc pigments, *see* 842.1, 842.64, 842.7; definitions, methods of testing pigments, *see* 840.3, 840.5.

842.88 Yellow, Cream, and Straw Pigments

References.—Yellow chromium pigments, *see* 842.5; ocher pigments, *see* 841.5.

842.9 MINERAL AND CHEMICAL PIGMENTS, DRY AND PASTE, NOT ELSEWHERE CLASSIFIED

American Society for Testing Materials, D 284-33; 1933. American Standards Assn., K59-1941. Method of Chemical Analysis of Dry Mercuric Oxide. For treatment of sample, alkalinity or acidity test by A.S.T.M. Method D-278, microscopic examination for free mercury, and procedure for determination of combined mercuric mercury and for ash.

American Society for Testing Materials, D 603-42; 1942. Aluminum Silicate Pigment. Cover the aluminum silicate pigment commercially known as china clay. Composition and properties, number of tests, and methods of testing.

American Society for Testing Materials, D 604-42; 1942. Diatomaceous Silica Pigment. Cover two types of diatomaceous silica pigments for use in paints—type A, standard fineness for general paint use; type B, extra fine, for special uses. Composition and properties, number of tests, and methods of testing.

American Society for Testing Materials, D 605-42; 1942. Magnesium Silicate Pigment. Cover the magnesium silicate pigment commercially known as talc. Composition and properties, number of tests, and methods of testing.

American Society for Testing Materials, D 607-42; 1942. Mica Pigment. Covers the finely divided mica, commercially known as pigment mica, suitable for use in the manufacture of protective coatings. Gives composition and properties, number of tests, and methods of testing. A.S.T.M. Emergency Alternate Provision EA-D 607; 1942, changed the requirement for total residue.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-A-566; 1941. Antimony Oxide; Dry (Pigment).

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-L-421; 1941. Lithopone; Cadmium, Dry.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-M-91; 1941. Magnesium Silicate; Dry (Pigment).

U. S. Gov., Federal Specifications TT-M-90; 1942. Magnesium Silicate; Dry (Paint-Pigment). Covers one type and grade. Gives physical requirements and chemical composition of material; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-P-21; 1941. Paint; Cement-Water, Powder, White and Tints (for Interior and Exterior Use). Applies to hydraulic base paints designed for use on porous surfaces of masonry, concrete, stucco, common brick, masonry block, and rough plaster (except gypsum plaster) as a decorative, protective, and water-repellent coating. Covers two types—(I) 65 percent, Portland cement and (II) 80 percent, Portland cement; and two classes—(A) without siliceous aggregate (for general use) and (B) with siliceous aggregate (for open texture walls). Gives requirements for composition, physical properties and working properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 52A1e; 1939. Aluminum Pigment (Paste Form).

U. S. Gov., Navy Dept., Specification 52C4b; 1934. Cuprous Oxide.

U. S. Gov., Navy Dept. Specification 52M1b; 1940. Mercuric Oxide (for Use in the Manufacture of Ships' Bottom Paint).

U. S. Gov., Navy Dept. Specification 52M2a; 1934. Magnesium Silicate (Pigment).

U. S. Gov., Navy Dept. Specification 52M3; 1943. Mica (Extender Pigment).

U. S. Gov., Navy Dept. Specification 52T4f; 1944. Titanium Barium, Pigment.

U. S. Gov., Navy Dept. Specification 52A10; 1944. Antimony Sulphide, Pigment, Paint Ingredient.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-11; 1942. Pigment; Magnesium Silicate. Covers one grade of dry pigment in two types—(I) low oil absorption and (II) high oil absorption. Gives physical and chemical requirements, color, oil absorption, and flattening properties of type II; inspection, sampling, and methods of test; and packaging and marking.

843. MIXED PAINTS, ENAMELS, ENAMEL PAINT, AND JAPAN

843.1 FLAT FINISH PAINT

U. S. Gov., Federal Specification TT-P-47; 1943. Paint; Oil, Interior, One-Coat Flat, Heavy-Bodied (for Thinning), Light Tints and White (Combined Sealer, Primer, and Finish). Shall be furnished in one grade and one type only. Covers material and workmanship, general requirements, detail requirements, methods of sampling, inspection, tests, packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-P-51a; 1937. Amendment 1; 1943. Paints; Oil, Interior, Eggshell-Flat-Finish, Ready-Mixed, Light Tints and White. Covers one grade. Gives requirements for pigment, liquid, details for ready-mixed paint, and composition; methods of sampling and testing; and packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-34; 1944. Paints; Interior, White and Tints (Flat and Eggshell). Covers one grade and two types—(I) white and (II) tints; for interior use over primed surfaces. Gives requirements for materials, workmanship, color, composition, fineness of grind, weight per gallon, nonvolatile, viscosity, coarse particles and skins, odor, flash point, moisture, skinning, working properties, drying properties, appearance after drying, recoating, gloss, wet hiding power, compatibility, and package stability; inspection, sampling, and methods of test; and packaging and marking.

References.—Painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

843.2 GLOSS FINISH PAINT

References.—Painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

843.3 ENAMELS AND ENAMEL PAINTS

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Synthetic Enamel.

843.31 Black and Gray Enamel

American Water Works Assn. Standard Specifications for Coal-Tar Enamel Protective Coatings for Steel Water Pipe of Sizes 30 Inches and Over, 7A.5-1940. Cover the material and application requirements for coal-tar enamel protective coatings for steel water pipe of large diameter where conditions warrant their use. The appendix provides additional exterior protective measures for extraordinary or severe soil conditions.

American Water Works Assn. Standard Specifications for Coal-Tar Enamel Protective Coatings for Steel Water Pipe of Sizes 4 1/2 Inches Outside Diameter up to but Not Including 30 Inches, 7A.6-1940. Cover the material and application requirements for coal-tar enamel protective coatings for steel water pipe of large diameter where conditions warrant their use. The appendix provides additional exterior protective measures for extraordinary or severe soil conditions.

Society of Automotive Engineers. Aeronautical Material Specification 2503; 1940. Black Finishing; Low Baking. For parts which do not exceed a temperature of 350°F. Gives requirements for process, preparation, priming coat, enamel finish, and approved materials.

Society of Automotive Engineers. Aeronautical Material Specification 2510A; 1944. Engine Gray Finishing; Low Baking. For parts which do not exceed a temperature of 300°F. Gives requirements for process, preparation, priming coat, enamel finish, and approved materials.

Society of Automotive Engineers. Aeronautical Material Specification 3120; 1940. Black Enamel; Glyceryl Phthalate. A gloss black as an exterior protective coating for metal surfaces, generally. Includes requirements for composition, components, quality, physical properties, working properties, tests, identification, approval, reports, and rejections.

Society of Automotive Engineers. Aeronautical Material Specification 3125; 1940. Engine Gray Enamel; Glyceryl Phthalate. A gloss engine gray as an exterior protective coating for metal and fabric and also for marking purposes. Includes requirements for composition, components, quality, physical properties, working properties, tests, identification, approval, results, and rejections.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-E-501-2; 1944. Enamel; Heat-Resisting, Glyceryl Phthalate, Black.

U. S. Gov., Federal Specification TT-E-496; 1941. Amendment 1; 1943. Enamel; Heat-Resisting (400 °F.), Black. Covers one type only—a bituminous base (unpigmented) product. Gives requirements for consistency, nonvolatile matter, drying properties, color, finish, flexibility, and flashpoint; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-E-521; 1930. Amendment 3; 1943. Enamel; Pigmented (Air-Drying and Baking), Black. Covers two types—(A) air-drying pigmented black enamel and (B) baking pigmented black enamel. Gives requirements for material, physical properties, performance, and composition; methods of sampling, testing, and basis of purchase; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 52E7; 1945. Enamel; Gray, Ready-Mixed, for Motor Vehicles.

U. S. Gov., Treasury Dept., Procurement Div., 357; 1939. Enamel; Glyceryl Phthalate, Marine Exterior, Black High Gloss. Shall be of one type and grade, free from toxic ingredients intended for outside or inside use on both wood and metal. Gives requirements for composition, weight, viscosity, coarse particles or skins, odor, flash point, moisture, working properties, drying properties, gloss, flexibility, water and gasoline resistance, and package stability; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-32; 1943. Enamel; Black, Interior (Oleoresinous), Gloss. Covers one type and grade for general interior use over primed surfaces but is not recommended as a deck enamel. Gives requirements for color, composition, weight per gallon, nonvolatile, viscosity, coarse particles and skins, odor, flash point, moisture, skinning, working properties, drying properties, appearance after drying, recoating, gloss, compatibility, and package stability; inspection, sampling, and methods of test; and packaging and marking.

References.—Painting practice, safety codes, definitions, methods of testing, *see* 840.1-840.5; elasticity tests of enamel of electric rigid conduit, *see* 715.11.

843.32 Brown Enamel

843.33 Cream Enamel

843.34 Green Enamel

U. S. Gov., Marine Corps Specification, 1934. Enamel; Green, Glyceryl Phthalate (for Motor Vehicles).

843.35 Olive-Drab Enamel

U. S. Gov., Federal Specification TT-E-514; 1943. Enamel; Lusterless, Olive-Drab (Primarily for Nonmilitary Use). Covers one grade and class for use as finish coat on motor vehicles, trailers, and similar equipment. Gives requirements for pigment, vehicle, nonvolatile matter, set, gloss, color; working properties and resistance to various conditions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-97; 1927. Enamel; Olive-Drab, for Fire-Control Instruments.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-181; 1943. Enamel; Olive-Drab, Rust-Inhibiting.

843.36 Red and Maroon Enamels

U. S. Gov., Federal Specification TT-E-531a; 1935. Amendment 3; 1943. Enamel; Water-Resisting, Red. Covers one type suitable primarily for outside use. Gives requirements for pigment, appearance, working properties, and trichromatic coefficients; methods of sampling and testing; and requirements for packaging, packing, and marking.

References.—Painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

843.37 White Enamels

U. S. Gov., Federal Specification TT-E-506a; 1938, Amendment 1; 1943. Enamel; Interior, Gloss, Light Tints and White. Covers enamels suitable for interior use in two types—(A) quick drying and (B) slow drying. Gives detail requirements for pigment, liquid, enamel, wet hiding power, drying time, and physical characteristics; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52P21; 1945. Paint; White-Enamel (Formula No. 30).

U.S. Gov., Treasury Dept., Procurement Div., No. 353; 1939. Enamel; Glyceryl Phthalate, Marine, Interior, White and Light Tints, Eggshell-Gloss. Covers one type and grade, free from toxic ingredients, and intended for interior finish. Gives requirements for chemical composition, weight, viscosity, coarse particles and skins, odor, flash point, moisture, working properties, drying properties, glass flexibility, and package stability, methods of sampling, inspection, and tests; and packaging, packing, and marking.

U.S. Gov., Treasury Dept., Procurement Div., No. 354; 1939. Enamel; Glyceryl Phthalate, Marine, Interior, White, High-Gloss. Shall be of one type and grade, free from toxic ingredients, intended for interior finish. Gives requirements for chemical composition, weight, viscosity, coarse particles and skins, odor, flash point, moisture, working properties, drying properties, gloss, flexibility, and package stability; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 3-170A; 1942. Paint; Ready-Mixed, White Enamel, Acid Proof.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-30; 1943. Enamels; White and Tints, Interior, (Gloss), Alkyd. Covers one grade and two types—(I) white and (II) tints. For interior use as a finishing enamel. Gives requirements for color, composition, tinting, weight per gallon, nonvolatile, viscosity, coarse particles and skins, odor, flash point, moisture, skinning, working properties, drying properties, after-tack, appearance after drying, recoating, gloss, compatibility, and package stability; inspection, sampling, and methods of test and packaging and marking.

843.38 Yellow Enamels

843.39 Miscellaneous Enamels and Enamel Paints

American Hospital Assn., 4-16. Enamel; Interior, Gloss, Light-Tint and White. Covers white and light-tint gloss enamels suitable for interior use in quick drying and in slow drying types. Based on U. S. Gov. Federal Specification TT-E-506a.

U. S. Gov., Army Air Forces. Specification 14109-B; 1943. Enamel; Quick Drying, Camouflage.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-133; 1944. Coatings; Fused, High Temperature.

U. S. Gov., Army-Navy Aeronautical Specification AN-E-3—3; 1944. Enamel; Aircraft, Gloss.

U. S. Gov., Army-Navy Aeronautical Specification AN-E-7-4; 1945. Enamel; Camouflage, Quick Drying.

U. S. Gov., Federal Specification TT-E-485; 1944. Enamel; Drum-Coating, Exterior, Rust-Inhibiting, Solvent-Resistant. Covers one grade and one type of combination air-drying and baking enamel for metal, suitable for brush or spray application. Gives requirements for material, toxicity, color, composition, package stability, consistency, brushing properties, spraying properties, appearance, coarse particles, odor, drying time, gloss, hiding power, flexibility, immersion resistance, and recoating; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1943. Enamel; Glyceryl Phthalate, Flat.

U. S. Gov., Navy Dept. Specification 52P17a; 1941. Enamel (and Primer); Bituminous.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Paints, Enamels for Truck Painting.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-67E; 1943. Enamel; Lustreless, Quick-Drying, for Ammunition.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-173; 1944. Enamel; Synthetic, Lustreless.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-174; 1944. Enamel; Synthetic, Semi-Gloss.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-175A; 1944. Enamel; Synthetic, Gloss.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-177; 1943. Enamel; Gloss, for Wood (Cleansing Compound Resistant).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-178; 1943. Enamel; Gloss, for Metal (Cleaning Compound Resistant).

U. S. Gov., Veterans Administration. Specification VA-X-66d; 1941. Paint; Enamel.

References.—Tests of enamel on magnet wire, *see* 715.44; Elasticity tests of enamel on electric rigid conduit, *see* 715.11.

843.4 JAPAN PAINTS

843.5 WHITEWASH AND CALCIMINE

National Lime Assn. Lime Hints for the Home. Whitewash. Gives recommended composition for simple mixture and for a durable, nonrubbing whitewash. Also, instructions for mixing, application, and use.

U. S. Gov., Federal Specification TT-C-96; 1940. Calcimine, Cold and Hot Water Types. Covers one grade. Gives requirements for color, odor, daylight reflectance for white, dry hiding properties, working properties, appearance, and condition of the calcimine film, removal properties, and spreading rate; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-P-23a; 1940. Paint; Cold Water, Interior, Light Tints and White. Covers two types—(I) powder and (II) paste. Gives requirements for application, odor, composition, working properties, and opacity; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Lime, *see* 517.2.

843.6 LEAD PAINTS, MIXED

843.61 Red-Lead Paints

American Assn. of State Highway Officials, M71-42. Standard Specifications for Red Lead (Dry and Paste-in-Oil) and Paint Made Therefrom. Gives scope, general requirements, dry pigment, paste-in-oil, paint, packing and marking, and methods of analysis.

American Assn. of State Highway Officials, M72-42. Standard Specifications for Red Lead Ready-Mixed Paint. Gives scope, general requirements, pigment, vehicle, composition, drying time, colors, packing and marking, and methods of analysis.

American Hospital Assn., 4-34. Ready-Mixed Linseed Oil Red-Lead-Base Paint. Covers one grade suitable for either outside or interior use. Based on U. S. Gov. Federal Specifications TT-P-86 for Paint, Red-Lead-Base; RR-S-366 for Standard Testing Sieves; TT-R-191a for Dry and Paste-in-Oil Red-Lead; and VV-L-791a for General Specifications (Methods for Sampling and Testing) Lubricants and Liquid Fuels.

U. S. Gov., Federal Specification TT-P-86; 1939. Amendment 1; 1943. Paint; Red-Lead-Base; Linseed Oil, Ready-Mixed. Covers one grade of paint for either outside or interior use. Gives detail requirements for pigment, vehicle, and properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Red lead pigments, lampblack, *see* 842.63, 842.4; linseed oil, turpentine, *see* 848.1, 848.7; painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

843.62 White-Lead Paints

American Hospital Assn., 4-37. Light Tints and White Ready-Mixed Basic-Carbonate White-Lead-Base Paint. Covers ready-mixed linseed oil white and tinted paints made on a basic carbonate white lead base.

U. S. Gov., Federal Specification TT-P-40; 1943. Paint; Oil, Exterior, Ready-Mixed, Light Tints and White. Type I, mixed-pigment base, class A—white, general-purpose, class B—white, special fume-proof (lead-free), class C—tint-base; and type II, white-lead base. Gives requirements for tints, pigment, ingredients, extenders, vehicle, apparent daylight reflectance, drying properties, consistency, working properties and surface appearance, resistance to sulfide fumes; methods of sampling, inspection, and tests; packaging, packing, and marking.

References.—White lead pigments, *see* 842.64, 842.87.

843.63 Blue-Lead Paints

U. S. Gov., Federal Specification TT-P-20; 1940. Amendment 1; 1943. Paint; Blue-Lead-Base, Basic Sulfate, Linseed Oil, Ready-Mixed. Covers one grade intended for either outside or interior use. Gives requirements for pigment, vehicle, and details for ready-mixed paint; methods of sampling, testing, and basis of purchase; and requirements for packaging, packing, and marking for shipment.

843.7 GRAPHITE PAINTS

American Assn. of State Highway Officials, M67-42. Standard Specifications for Green Graphite Bridge Paint. Covers linseed oil green ready-mixed paint for bridges. Gives general requirements, pigment, vehicle, composition, drying time, weight, packing and marking, and methods of analysis.

U. S. Gov., Federal Specification TT-P-27; 1938. Paint; Graphite, Outside, Ready-Mixed, Black. Covers a ready-mixed, linseed oil, black graphite paint intended for outside use on either wood or metal; and two types—(I) only natural crystalline flake graphite permitted and (II) may be either amorphous graphite, crystalline graphite, mined or manufactured, or a mixture thereof. Gives requirements for pigments, liquid, and details for ready-mixed paint; methods of sampling and testing; and packaging, packing, and marking for shipment.

843.8 IRON OXIDE PAINTS

U. S. Gov., Federal Specification TT-P-31a; 1941. Paint; Iron Oxide, Ready-Mixed and Semipaste, Red and Brown. Covers one grade of linseed oil-iron oxide paint. Gives requirements for pigment, liquid, composition, and ingredients; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Amendment 1, July 1943, deletes "and Semipaste" from title, changes vehicle, and modifies specification.

References.—Iron oxide pigments, *see* 841.41; linseed oil, turpentine, *see* 848.1, 211.1; painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

843.9 MISCELLANEOUS PAINTS

U. S. Gov., Army-Navy Aeronautical Specification AN-P-31; 1943. Paint; Blended Type, Coal-Tar Pitch-Base, Bituminous.

844. MIXED PAINTS AND PROTECTIVE COMPOUNDS NOT ELSEWHERE CLASSIFIED

844.1 ANTIFOULING AND METAL-PROTECTING PAINTS AND COMPOUNDS

American Gear Manufacturers Assn. Standard 254.02; 1944. Data Sheet—Rust Preventatives. Covers scope, preparation of surface for coating, inside preparation of gear cases, coating compounds for interior of cases, machined surfaces, coating compounds for external use, and rust removal from machined and nonmachined surfaces.

American Society for Testing Materials, D 277-31; 1931. Toxic Ingredients in Antifouling Paints (Dry Cuprous Oxide, Dry Mercuric Oxide). Gives requirements for amounts of ingredients for general use, for temperate and tropical waters, fineness and oxide content of powders, ash, and purity of mercuric oxide.

Society of Automotive Engineers. Aeronautical Material Specification 2574; 1943. Preservations of Engines (Limited Period). Provides preparing aircraft engines to resist corrosion during shipment and limited storage under favorable conditions. Material and equipment, preliminary operation, preparation for storage procedure, recommended procedure for represervation, and general.

Society of Automotive Engineers. Aeronautical Material Specification 3072A; 1943. Compound; Corrosion Preventive (Aircraft Engine). Consists of a mixture of aircraft engine lubricating oil and a corrosion inhibitive agent as an additive and is suitable for the preservation of metal parts of aircraft engines during shipment and storage and for lubricating the engine while operating as specified. Covers quality, physical requirements, tests, reports, identification, approval, and rejection. Similar to Army-Navy Aeronautical Specification AN-VV-C-576.

Society of Automotive Engineers. Aeronautical Material Specification 3075; 1943. Compound; Corrosion-Preventive (Parts and Equipment). Consists of a homogeneous, stable, noncorrosive, nondrying, nonpoisonous, solid grease consisting of refined petrolatum with additives and suitable for the external preservation of miscellaneous metal parts, tools, subassemblies and equipment against corrosion during extended periods of shipment and/or storage. Application, requirements, test procedures, reports, identification, approval, and rejection. Similar to Army-Navy Aeronautical Specification AN-C-52, type II.

Society of Automotive Engineers. Aeronautical Material Specification 3080A; 1944. Compound Anti-Seize (White Lead Base). A paste to be applied to threads on removable plugs when assembling to prevent seizure while assembling or disassembling. Gives requirements for composition, components, quality, corrosion, containers, identification, approval, and rejections. Similar Specification: Army-Navy Aeronautical AN-C-53.

Society of Automotive Engineers. Aeronautical Material Specification 3082A; 1944. Compound; Anti-Seize (Mica Base). A paste primarily for application to threads of aircraft engine spark plugs to prevent seizure while assembling or disassembling but may be used on other threaded fittings where applicable. Gives requirements for composition, components, quality, containers, identification, approval, and rejections. Similar Specification: Army-Navy Aeronautical AN-VV-C-566.

U. S. Gov., Army Air Forces. Specification 20023 (1); 1944. Finishes; Fire Retardant, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-52a-1; 1944. Compound; Exterior Surface, Corrosion Preventive.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-53-2; 1943. Compound; Anti-Seize, White Lead Base, for Threaded Fittings.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-124-3; 1945. Compound; Soft-Film Corrosion Preventive.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-8; 1942. Metal Spraying, Process for.

U. S. Gov., Army-Navy Aeronautical Specification AN-VV-C-566—3; 1943. Compound; Anti-Seize, Mica-Base (for Threaded Fittings).

U. S. Gov., Army-Navy Aeronautical Specification AN-VV-C-576a—2; 1944. Compound; Corrosion Preventive, Aircraft Engine.

U. S. Gov., Navy Dept. Specification 14C6a; 1941. Compound; Rust Preventive, Pigmented.

U. S. Gov., Navy Dept. Specification 52C14; 1941. Compound; Joint-and-Thread, High Temperature.

U. S. Gov., Navy Dept. Specification 52C18; 1945. Compound; Rust Preventive, Thin-Film, Polar Type.

U. S. Gov., Navy Dept. Specification 52C19; 1945. Compound; Antiseize.

U. S. Gov., Navy Dept. Specification 52P19a; 1944. Paint; Heat Resisting.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-82C; 1940. Compound; Rust Preventive, Heavy.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 2-84B; 1941. Compound; Rust Preventive, Light. Formerly Designated Medium.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 83-12A; 1939. Flux; Nonacid.

U. S. Gov., U. S. Maritime Commission. Specification 14-MC-1; 1944. Compound; Packing, for Propeller Hub and Cap Void Spaces. Covers one type and grade. Gives requirements for material and workmanship, homogeneity, odor, corrosion of copper, protection of steel, dropping point, penetration, water absorption, water content, free acid, and fillers and abrasive substances; inspection, sampling, and methods of test; and packaging, packing, and marking.

References.—Methods of analysis of cuprous oxide and mercuric oxide, *see* 842.9; linseed oil, turpentine, *see* 848.1, 211.1; painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

844.2 BUILDING PAINTS NOT ELSEWHERE CLASSIFIED

U. S. Gov., Federal Specification TT-P-24; 1943. Paint; Concrete and Masonry, Exterior, Egg-Shell Finish, Ready-Mixed, White and Tints. Paint shall be furnished in two types and one grade. Type I, white only and Type II, tint-base-white. Shall be ready-mixed and be suitable for use as an exterior finish coat on concrete, brick, stucco, and similar surface material (except floors). Gives requirements for pigment, vehicle, color, drying properties, consistency, flexibility, water resistance, working properties and surface appearance, and chalk resistance; methods of sampling, inspection, tests; packaging, packing, and marking for shipment.

844.3 FIELD-COAT PAINTS

U. S. Gov., Treasury Dept., Procurement Div., 439A; 1942. Coating Material; Bituminous (Nonbleeding), Brushing Consistency (for Foundations, Roofs, Walls, Etc.). Shall be composed of suitable inorganic filler, volatile organic solvent, and binder consisting of suitable bituminous materials; intended for use as a dampproofing material in the maintenance of bituminous and metal roofing and for application on walls and foundations. Gives requirements for colors; consistency, nonvolatile matter, inorganic filler and tinting material, heat and cold test, and paint bleeding test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Paint pigments, *see* also 841, 842; linseed oil, turpentine, *see* 848.1, 211.1; painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

844.4 PRIMING PAINTS

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 201-43; 1944. Primer Paint for Steel and Iron Structures. Covers material and workmanship, general composition and properties, application, inspection, tests, shipping containers, packing, marking, and warranty.

Society of Automotive Engineers. Aeronautical Material Specification 3110; 1940. Primer Zinc Chromate. For general use on metal surfaces before enameling. Includes requirements for composition, compounding, quality, physical properties, working properties, tests, identification, approval, reports, and rejections.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-49; 1943. Primer; Zinc Chromate, Reclaimed, Blended.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-P-656b—1; 1944. Primer; Zinc Chromate.

U. S. Gov., Federal Specification TT-P-25; 1942. Paint; Exterior-Primer, Ready-Mixed, White (Undercoat for Wood). Covers one grade, intended for use as exterior primer for wood. Gives requirements for white lead, titanium dioxide, barium sulfate, matter soluble in water, liquid, kauri reduction, ready-mixed paint, consistency, drying time, pigment volume, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification TT-P-56; 1935. Amendment 1; 1936. Paint; (for) Priming Plaster Surfaces (Plaster Primer and Sealer). Covers one grade of ready-mixed white paint of the bodied oil or varnish type for interior use as a primer on unpainted, old or new, plaster surfaces. Intended to seal and stop the varying "suction" of porous plaster by one coat. Gives detail requirements for composition and properties; methods of sampling and testing; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification TT-P-641; 1939. Primer; Paint, Zinc Dust-Zinc Oxide, for Galvanized (Zinc-Coated) or Zinc Surfaces. Covers three types—(I) zinc dust-zinc oxide-linseed oil paint, (II) zinc dust-zinc oxide-glyceryl phthalate paint, and (III) zinc dust-zinc oxide-phenolic resin paint; and two classes—(A) ready-to-mix and (B) ready-mixed. Gives requirements for composition, pigment, liquid, and paint; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Amendment 1, Sept. 1943, deletes types II and III, changes vehicle, and makes necessary changes.

U. S. Gov., Navy Dept. Specification 52P17a; 1941. Primer (and Enamel); Bituminous.

U. S. Gov., Navy Dept. Specification 52P65; 1944. Primer; Paint, Iron Oxide, Ready-Mixed, for Motor Vehicles.

U. S. Gov., U. S. Army, Army Air Forces. Specification 3-156; 1932. Primer; Metal, Iron Oxide.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 39-2; 1943. Primer; Camouflage Paint, Oil Type, for Wood.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-165A; 1939. Primer; Metal, Quick-Drying.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-171; 1944. Primer; Synthetic, for Ferrous Metals.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-18; 1943. Primer; Red Lead, Modified. Covers one type and grade. For use on bare metal. Gives requirements for color, composition, kettle bodied linseed oil, weight per gallon, nonvolatile, viscosity, coarse particles and skins, odor, flash point, moisture, skinning, working properties, drying properties, after tack, appearance after drying, recoating, gloss, compatibility, and package stability; inspection, sampling, and methods of test; and packaging and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-17; 1943. Primer; White and Tints, Interior (Wood). Covers two types—(I) white and (II) tints; and two classes—(A) nontoxic and (B) toxic. For interior use on bare wood. Gives requirements for color, composition, varnish, kettle bodied linseed oil, tinting, weight per gallon, nonvolatile, viscosity, coarse particles and skins, odor, flash point, moisture, skinning, working properties, sanding, holdout, and package stability; inspection, sampling, and methods of test; and packaging and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-20; 1943. Primer; Red Lead and Oil, Ready Mixed. Covers one type and grade. For use over bare metal. Gives requirements for color, composition, weight per gallon, viscosity, moisture, flash point, odor, coarse particles and skins, skinning, working properties, drying properties, recoating, gloss, compatibility, and package stability; inspection, sampling, and methods of test; and packaging and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-23; 1943. Primer; Red Lead, Quick Drying (Synthetic). Covers one type and grade for use on bare metal. Gives requirements for color, composition, weight per gallon, nonvolatile, viscosity, coarse particles and skins, odor, flash point, moisture, skinning, working properties, drying properties, appearance after drying, recoating, gloss, compatibility, and package stability; inspection, sampling, and methods of test; and packaging and marking.

References.—*See* references under 844.3.

844.5 STENCIL PAINTS

U. S. Gov., Federal Specification RR-S-714; 1943. Amendment 1; 1944. Stencil-Outfits (Letters and Figures); Metallic. Shall be of the lockedge type, and shall be 1/2, 1, 2, 4, and 6-in. sizes. Covers material, workmanship, and details of stencil-outfit, stencils, ink, brush, stencil box, and marking;

methods of sampling, inspection, tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 3-120-D; 1941. Colors; Insignia, in Oil (Semi-Paste).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-179; 1943. Paint; Stencil.

844.6 PAINTS CLASSIFIED BY COLOR ONLY

844.61 Black and Gray Paints

American Assn. of State Highway Officials, M68-42. Standard Specifications for Black Bridge Paint. Covers linseed oil black ready-mixed paint for bridges. Gives general requirements, pigment, vehicle, composition, drying time, weight, packing and marking, and methods of analysis.

U. S. Gov., Federal Specification TT-P-61a; 1944. Paint; Ready-Mixed, Black. Covers one grade and type of black, ready-mixed, linseed oil paint. Gives requirements for pigment, liquid, and ready-mixed paint composition; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52P51; 1945. Paint; Outside, Pale-Gray (Formula No.5P).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-106E; 1941. Paint; Acid-Proof Black, for Ammunition.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-128; 1926. Black Target Paint.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-5; 1943. Amendment 2; 1944. Paints; Gray, Low-Visibility (Alkyd), Eggshell. Covers one grade and two types—(I) deck gray (horizontal surfaces) and (II) slate gray (vertical surfaces). For interior or exterior finish coat over metal, wood, or composition surfaces. Gives requirements for color, composition, tinting, weight per gallon, total solids, viscosity, coarse particles and skins, odor, flash point, moisture, skinning, working properties, drying properties, appearance after drying, recoating, gloss, flexibility, water resistance, compatibility and package, stability; inspection, sampling, and method of test; and packing and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-6; 1943 Amendment 2; 1944. Paint; Hull Gray, Low Visibility (Alkyd), Eggshell. Covers one type and one grade. For interior or exterior finish coat over metal, wood, or composition surfaces. Gives requirements for color, composition, tinting, weight per gallon, total solids, viscosity, coarse particles and skins, odor, flash point, moisture, skinning, working properties, appearance after drying, recoating, gloss, flexibility, water resistance, compatibility, and package stability; inspection, sampling, and methods of test; and packaging and marking.

References.—Black pigment, *see* 842.4; linseed oil, turpentine, *see* 848.1, 211.1; painting practice, safety codes, definitions, methods of testing, *see* 840.1-840.5.

844.62 Blue Paints

U. S. Gov., Navy Dept. Specification 52P43; 1945. Paint; Deck, Blue, Formula No.20B.

U. S. Gov., Navy Dept. Specification 52P47; 1945. Paint; Outside, Thayer-Blue, Formula No.5B.

References.—White-lead and zinc-oxide paint, *see* 844.67.

844.63 Brown Paints

844.64 Buff, Drab, and Slate Paints

844.65 Green and Olive Paints

U. S. Gov., Federal Specification TT-P-71a; 1941. Amendment 1; 1943. Paint; Ready-Mixed, Exterior, Chrome-Green. Covers but one grade and type of ready-mixed green trim paint. Gives requirements for pigment, vehicle, semipaste, and ready-mixed paint; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification TT-P-81a; 1943. Paints; Ready-Mixed, Olive-Drab. Covers one grade and one type linseed oil paint suitable for outside use. Gives requirements for pigment (white lead, zinc oxide, tinting colors and extending pigment, organic colors, and sulfide sulfur), vehicle, and ready-mixed paint (pigment, liquid, water, and coarse particles and skins); methods of sampling, inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1943. Paint; Ready-Mixed and Semipaste, Exterior, Chrome-Green.

U. S. Gov., Navy Dept. Specification 52P50; 1945. Paint; Tinting, Green (Chromium Oxide), Formula No. 5GTM.

U. S. Gov., Navy Dept. Specification 52P53; 1945. Paint; Outside, Pale-Green, Formula No.5PG.

U. S. Gov., Navy Dept. Specification 52P56; 1945. Paint; Outside, Ocean-Green, Formula No. 5-OG.

References.—Lead pigments. zinc pigments, *see* 842.6, 842.7; linseed oil, turpentine, *see* 848.1, 211.1; painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

844.66 Red Paints

U. S. Gov., Navy Dept. Specification 52P23; 1945. Paint; Deck, Red, Formula No.23.

References.—Red lead pigments, *see* 843.61; red enamel, *see* 843.36; red pigments, *see* 842.63, 842.86.

844.67 White and Light-Tinted Paints

American Assn. of State Highway Officials, M70-42. Standard Specifications for White and Tinted Ready-Mixed Paint (Lead and Zinc Base). Covers linseed oil paint, lead-zinc base, for outside use. Gives pigment, vehicle, composition, drying time, weight, packing and marking, and methods of analysis.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP1007; 1937. Some Properties and Tests of Traffic or Zone Paints. This publication describes some properties and tests of traffic paints. These paints are of a different type from ordinary paints and vary greatly in abrasion resistance. Experience gained from actual road tests is cited. An accelerated wearing test is described. A distinct improvement in durability of the traffic paints in actual service has resulted. Specifications for white and yellow traffic paints are suggested.

U. S. Gov., Federal Specification TT-P-40; 1943. Paint; Oil, Exterior, Ready-Mixed, Light Tints and White. Type I, mixed-pigment base, class A—white, general-purpose, class B—white, special fume-proof (lead-free), class C—tint-base; and type II, white-lead base. Gives requirements for tints, pigment, ingredients, extenders, vehicle, apparent daylight reflectance, drying properties, consistency, working properties and surface appearance, resistance to sulfide fumes; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., Federal Specification TT-P-88; 1940. Amendment 1; 1943. Paint; Emulsion, Interior, Paste, Light Tints and White. Covers one grade and type, for use as a decorative coating on interior walls and ceilings. Gives requirements for mixing and application, composition, properties of ready-mixed paste, and details; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Works Agency, Public Roads Administration. Specification for Construction of Roads and Bridges in National Forests and National Parks, FP-41. Traffic Stripes.

U. S. Gov., Treasury Dept., Procurement Div., No.359; 1939. Paint; Glyceryl Phthalate, Marine, Exterior, White and Light Tints. Shall be one grade, seven types—(I) white, eggshell-gloss; (II) white, high-gloss; (III) gray (Navy); (IV) gray, ship and deck; (V) light-buff; (VI) dark-buff; and (VII) pea-green. Gives requirements for chemical composition, weight, viscosity, coarse particles and skins, odor, flash point, moisture, working and drying properties, gloss, flexibility, gasoline resistance, package stability, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Titanium pigments, white lead pigments, zinc pigments, *see* 842.1, 842.64. 842.7; linseed oil, turpentine, *see* 848.1, 211.1; painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5; paints, *see* 843.1, 843.2.

844.68 Yellow, Cream, and Straw Paints

U. S. Gov., Federal Specification TT-P-53; 1937. Paint; Outside, Ready-Mixed, Light-to-Medium Chrome Yellow. Covers a high-grade, linseed oil, chrome yellow paint intended for outside use on either wood or metal. Gives requirements for pigment, liquid, and details for ready-mixed paint; methods of sampling and testing; and packaging, packing, and marking.

844.69 Miscellaneous Paints Classified by Color

U. S. Gov., Federal Specification TT-P-59; 1937. Amendment 1; 1943. Paint; Ready-Mixed, International-Orange. Covers one class and one type of ready-mixed chrome orange linseed oil paint. Gives requirements for color, pigment, vehicle, and details for ready-mixed paint; methods of inspection and tests; and packaging, packing, and marking.

References.— Tinted paints on white base, *see* 844.87.

844.7 LUMINESCENT MATERIAL

U. S. Gov., Army Air Forces. Specification 14102-A (2); 1943. Luminescent Material; Phosphorescent.

U. S. Gov., Army Air Forces. Specification 14112 (1); 1943. Luminescent Material; Fluorescent, Radioactive.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-1a-1; 1944. Luminescent Material; Fluorescent.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-13a; 1944. Luminescent Material; Fluorescent, Radioactive.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3001; 1944. Markings; Self-Luminous.

844.9 MISCELLANEOUS PAINTS

U. S. Gov., Army Air Forces. Specification 14129; 1944. Paint; Bullet Tipping.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS98-42; 1942. Artists' Oil Paints. The purposes of this commercial standard are to serve as a guide to artists in the purchase of paints of satisfactory color, working quality, and durability; to eliminate confusion in nomenclature; to promote fair competition among manufacturers by providing criteria for differentiation among paints of known satisfactory composition and others of unknown or inferior quality, and thus to provide a basis for certification of quality. Covers minimum requirements for artists' oil paints of satisfactory color and durability. It is not intended that all paints meeting the requirements shall be identical nor of uniform excellence in all respects. Variations in manufacture and grinding not controlled by the specification may cause some artists to prefer one brand over another, both of which are acceptable under this specification.

U. S. Gov., Federal Specification TT-P-22; 1943. Paint; Cold-Water, Exterior, Powder (With Mixing Liquid). Covers one type of dry powder paint and a supplementary mixing liquid, which when combined with water is suitable for exterior use on concrete, brick, stucco, cinder block, wood, etc. Gives requirements for powder and mixing liquid; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification TT-P-91; 1939. Paint; Rubber-Base (for) Cement Floors. Covers one type and grade, ready-mixed for use. Gives detail requirements for pigment, vehicle, and drying properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification TT-P-115; 1942. Paint; Traffic, Exterior, White and Yellow. Covers one grade. Gives requirements for physical properties and performance; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-TT-P-115; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted a white traffic paint and gave general and detail requirements for same.

U. S. Gov., Federal Specification TT-P-146, 1942. Paint; Varnish-Base, for Concrete and Wood Floors. Covers one grade, ready-mixed, for use on interior or exterior floors. Gives requirements for material and workmanship, color, composition, and properties; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1943. Paint; Ready-Mixed, Sign Painters'.

U. S. Gov., Navy Dept. Specification 52P74; 1944. Paint; Camouflage, Oil Type, Ready-Mixed.

U. S. Gov., Navy Dept. Specification 52P75; 1944. Paint; Camouflage, Resin-Oil-Emulsion Type and Resin-Emulsion Type, Paste.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Paint; Cold-Water, Interior; 1941.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 39-3; 1943. Paint; Powder, Camouflage, Gasoline Soluble.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 39-12A; 1944. Paint; Face, Camouflage, Stick Form.

U. S. Gov., Veterans Administration. Specification VA-X-69a; 1941. Paint; Artists, Moist Water Color.

References.—Painting practice, safety codes, definitions, colors, methods of testing, *see* 840.1-840.5.

845. STAINS

845.1 SHINGLE STAINS

845.2 WOOD STAINS IN TURPENTINE

845.3 WOOD STAINS IN OIL

U. S. Gov., Treasury Dept., Procurement Div., No. 615; 1943. Stain; Wood, Interior. Shall be furnished in one type and one grade. Covers materials, general requirements, consistency, drying time, nonvolatile matter, dilution, working properties, odor, methods of sampling, tests, packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-MC-268f; 1941. Stains; Wood.

846 VARNISH AND VARNISH GUMS AND RESINS

846.0 GENERAL ITEMS

American Society for Testing Materials, D 154-43; 1943. Methods of Testing Oleoresinous Varnishes. Gives requirements for appearance, color, nonvolatile matter, elasticity or toughness, flash point, viscosity, water test, skinning test of varnish in closed containers, alkali resistance test, and acid number.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 11.71; 1940. Pyroxylin Plastic, Its Hazards, and Special Precautions Needed for Storage and Handling. Includes recommendations for storage cabinets and vaults.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Varnish. Covers definition, constants, containers, shipping regulations, ordering instructions, types and uses, components of varnishes, and general classifications.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Lacquer.

U. S. Gov., Federal Specification TT-P-141; 1941. Paint, Varnish, Lacquer, and Related Materials. General Specifications (Methods of Sampling and Testing). Covers methods used officially in sampling and routine testing of paints, including procedure and apparatus.

References.—Methods of testing electrical insulating varnishes, *see* 719.57.

846.1 SPIRIT VARNISHES

846.11 Shellac Varnishes

American Bleached Shellac Manufacturers Assn. and U. S. Shellac Importers Assn. Methods of Sampling and Testing Shellac Varnish, 1934. Gives requirements as to the procedures necessary for sampling and testing.

American Bleached Shellac Manufacturers Assn. and U. S. Shellac Importers Assn. Specifications for Shellac Varnish, 1934. To be furnished as orange—grades A or D; and as bleached—grades regular or refined. Gives requirements as to color, drying time, body, properties, packing and marking, and methods of testing.

American Society for Testing Materials, D 29-40; 1940. Methods of Sampling and Analysis of Shellac. Covers dry shellac and shellac varnish; method for orange shellac, either free, blocky, or matted; bleached shellac; requirements for extraction apparatus for insoluble test and outline of procedure, iodine number and solutions necessary, qualitative tests for rosin and copal, determination of moisture, orpiment in orange shellac, wax, soluble matter, ash and color. For shellac varnish, color, nonvolatile matter, wax, iodine number, insoluble matter, purity, drying time, volatile matter, and weight.

American Society for Testing Materials, D 360-41; 1941. Shellac Varnishes. Includes two grades of both orange and bleached shellac solutions in 190 proof denatured alcohol, formula No. 1 of the U. S. Internal Revenue Bureau, or in other specified solvent. Color, copal, drying time, body properties, packing and marking, and methods of testing.

U. S. Gov., Federal Specification TT-V-91a; 1940. Amendment 2; 1944. Varnish; Shellac. Covers two types—(I) bleached and (II) orange; two grades in type I—(A) regular and (B) refined; two grades in type II—(A) low iodine number and (B) high iodine number; and three bodies in each grade—(1) light, (2) medium, and (3) heavy. Gives requirements for material, workmanship, iodine number, insoluble matter, wax, ash, color, maximum allowable percentage of nonvolatile matter, set to touch, dry hard, and appearance of dried varnish film; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing varnishes, *see* 846.0; shellac gum, alcohol, *see* 846.62, 822.3, and 822.4; safety codes, definitions, colors, *see* 840.2-840.4.

846.12 Damar Varnishes

U.S. Gov., Federal Specification TT-V-61; 1939. Amendment 1; 1944. Varnish; Damar. Covers one grade. Gives requirements for color, nonvolatile matter, nature of volatile matter, acid number, viscosity, appearance, and mixing and baking tests; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

846.2 LONG OIL VARNISHES

846.21 Spar Varnish

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-V-116—2; 1943. Varnish; Spar, Glyceryl Phthalate.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-V-118; 1941. Varnish; Spar, Phenol-Formaldehyde.

U.S. Gov., Federal Specification TT-V-121b; 1943. Amendment 1; 1944. Varnish; Spar, Water-Resisting. Shall be of one grade only, and the raw materials and processes of manufacture used shall be such as to produce varnish meeting this specification. Gives requirements for appearance, color, flash point, nonvolatile matter, set to touch, dry hard, viscosity, at 25° C., working properties, safety of working, water resistance, toughness, skinning, and odor; methods of sampling and testing; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-7; 1942. Amendment 1; 1943. Varnish; Spar, Water-Resisting. Covers one type and grade. For exterior finishing varnish and as a vehicle for pigmented products. Gives requirements for appearance, color, flash point, nonvolatile matter, set to touch, dry hard, after tack, gloss, viscosity, working properties, safety of working, water resistance, toughness, skinning, odor, and reactivity; inspection, sampling, and methods of test; and packaging and marking.

References.—Aluminum powder, *see* 847.1; methods of testing varnishes, *see* 846.0; safety codes, definitions, colors, *see* 840.2-840.4.

846.29 Miscellaneous Waterproof Varnishes

U. S. Gov., Federal Specification TT-V-130; 1943. Varnish; Spirit (Shellac Varnish Replacement). Covers one grade and one type. Gives requirements for material, appearance, color, viscosity, nonvolatile matter, ash, drying properties, working properties, adhesion properties, effect on wood, resistance to abrasion, odor, dilution, and sanding properties and sealing properties; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-X-64e; 1943. Paint; Lacquer, Brushing.

References.—Insulating varnish for electrical wire, *see* 719.57.

846.3 SHORT OIL VARNISHES

846.31 Rubbing Varnish

U. S. Gov., Federal Specification TT-V-86; 1939. Amendment 1; 1941. Varnish; Rubbing, Cabinet. Covers one type and grade. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-14; 1942. Varnish; Rubbing, Furniture. Covers one type and grade. Gives requirements for appearance, color, flash point, nonvolatile matter, set to touch, dry hard, gloss, viscosity, working properties, safety of working, water resistance, toughness, skinning, odor, rubbing properties, and alcohol resistance; inspection, sampling, and methods of test; and packaging and marking.

References.—Interior varnish, rubbing quality, *see* 846.32.

846.32 Interior Varnishes Except Floor Varnish

American Hospital Assn., 4-61. Interior Varnish. Covers one grade only. Based on U. S. Gov. Federal Specifications TT-V-71a.

U. S. Gov., Federal Specification TT-V-71a; 1939. Amendment 2; 1943. Varnish; Interior. Covers one grade. Gives requirements for appearance, color, nonvolatile matter, set to touch, dry hard, toughness, working properties, water resistance, viscosity, safety of working, skinning, and odor; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Methods of testing varnishes, *see* 846.0; safety codes, definitions, colors, *see* 840.2-840.4.

846.33 Floor Varnishes

Maple Flooring Manufacturers Assn. Finishes for Maple, Beech, and Birch Floors, 1940. Gives specifications for general requirements, detailed requirements, and methods of testing for heavy duty finishes and for gymnasium-type finishes.

References.—Interior varnish for floors, *see* 846.32.

846.4 ASPHALT VARNISHES

846.41 Air Drying Asphalt Varnish

U. S. Gov., Federal Specification TT-V-51a; 1944. Varnish; Asphalt. Covers one grade. Gives requirements for materials, appearance, color, flash point, nonvolatile matter, set to touch, dry, matter insoluble in carbon disulfide, working properties, miscibility with linseed oil, water resistance, toughness, resistance to oil, and odor; methods of sampling and testing; and packaging, packing, and marking for shipment.

References.—Methods of testing varnishes, *see* 846.0; linseed oil, *see* 848.1; safety codes, definitions, colors, *see* 840.2-840.4.

846.42 Baking Asphalt Varnish

846.5 CELLULOSE ACETATE AND CELLULOSE NITRATE PRODUCTS (LACQUERS AND PLASTICS)

References.—Soluble guncotton for medicinal purposes, *see* 862; amyl alcohol, butyl alcohol, for use with cellulose ester coatings, *see* 822.1, 822.2; butyl propionate, ethyl acetate, ethyl lactate, normal butyl acetate, for use with cellulose ester coatings, *see* 839.9; methods of testing lacquer solvents and diluents, *see* 839.9; methods of testing varnishes, *see* 846.0; safety codes, definitions, colors, methods of testing pigments in lacquer, *see* 840.2-840.5; storage provisions and requirements for pyroxylin plastic and of motion picture film, *see* 518.50; pyroxylin impregnated shade cloth, *see* 392.22; methods of testing nitrocellulose clear lacquers and lacquer enamels, *see* 840.5; cotton fabrics for pyroxylin coating, *see* 304.71; bakelite, *see* 719.58.

846.50 General Items

American Society for Testing Materials, D 301-33; 1933. Specifications and Tests for Soluble Nitrocellulose. Also known as soluble cotton; describes properties, sampling, and methods of testing for ash, nitrogen, stability, consistency, solubility, film test, toluol dilution, and design of apparatus for nitrogen determination; and copper bath for stability test.

American Society for Testing Materials, D 365-39; 1939. Methods of Testing Soluble Nitrocellulose Base Solutions. Gives procedures for determination of consistency (viscosity), nonvolatile matter, appearance, depth of color, with details as to apparatus, special solutions, and preparation of color standards required.

American Society for Testing Materials, D 522-41; 1941. Method of Test for Elongation of Attached Lacquer Coatings With the Conical Mandrel Test Apparatus. For lacquer coatings applied to sheet metal of uniform surface texture. Apparatus, metal specimens, conditioning and number of tests, procedure, and measurement of elongation.

Manufacturing Chemists' Assn. Manual Sheet N-1. Handling of Nitrocellulose Wet With Alcohol (or Other Organic Liquid) or Water While in I.C.C. Containers, in Storage or in Process. Recommended Practice. Adopted, 1940. Revised, 1943. Includes description of nitrocellulose, containers, labels, and I.C.C. classifications, and recommendations for handling containers, storage, handling in process, empty barrels, mechanical work and repairs, and fire prevention and protection.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Lacquer. Covers definition, constants, containers, shipping regulations, types and uses, components, and ordering instructions.

846.51 Aircraft Varnish

U. S. Gov., Army Air Forces. Specification 14105-C; 1943. Lacquer; Cellulose Nitrate, Camouflage.

U. S. Gov., Army Air Forces. Specification 14106-B; 1943. Dope; Camouflage, Pigmented Nitrate.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-89; 1943. Cellulose Acetate Butyrate.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-1-2; 1944. Dope; Cellulose Acetate Butyrate, Clear.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-2-3; 1944. Dope; Cellulose Acetate Butyrate, Pigmented, Gloss.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-3-1; 1943. Dope; Cellulose Acetate Butyrate, Pigmented, Camouflage.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-8—2; 1944. Dope; Cellulose Nitrate, Pigmented, Camouflage.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-C-181-1; 1943. Cellulose Nitrate.

U. S. Gov., Army-Navy Aeronautical Specification AN-O-B-841; 1941. Butyl Acetate.

U. S. Gov., Army-Navy Aeronautical Specification AN-O-D-361; 1941. Dibutyl Phthalate.

U. S. Gov., Army-Navy Aeronautical Specification AN-O-E-758-1; 1941. Ethyl Acetate.

U. S. Gov., Army-Navy Aeronautical Specification AN-O-E-766; 1941. Ethyl Cellulose.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-29; 1943. Triphenyl Phosphate.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-30; 1943. Tricresyl Phosphate.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-A-511; 1941. Amyl Acetate.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-D-514—3; 1944. Dope; Cellulose Nitrate, Clear.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-D-554-4; 1944. Dope; Cellulose Nitrate, Pigmented.

U. S. Gov., U. S. Army, Army Air Forces. Specification 98-24100U; 1942. Doping Aircraft Surfaces.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 4-27; 1929. Butyl Acetate (for Use in Aircraft Dope).

846.52 Ammunition Varnish

U. S. Gov., Army Air Forces. Specification 24114-A; 1942. Camouflage Finishes for Aircraft.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-158A; 1942. Lacquer; Cellulose Nitrate, and Thinner (Clear and Pigmented).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-162A; 1940. Lacquer Enamel; Nitrocellulose, and Thinner, for Ammunition.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-185; 1943. Lacquer; Purple.

846.53 Metal Varnish

U. S. Gov., Army-Navy Aeronautical Specification AN-L-29; 1944. Lacquer; Cellulose Nitrate.

846.54 Wood Varnish

U. S. Gov., Army-Navy Aeronautical Specification AN-C-83—2; 1943. Coatings, Protective (for Wood).

846.59 Miscellaneous Cellulose Products

American Society for Testing Materials, D 657-44; 1944. Isoprophyl Acetate. Covers two grades of isoprophyl acetate, as follows—85 to 88 percent grade and 95 to 98 percent grade.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cellulose Acetate. Covers definition, constants, solubility, derivation, uses, grades and forms, general characteristics, and substitutes.

U. S. Gov., Army Air Forces. Specification No. 14130; 1944. Compound; Protective Plastic Stripping.

U. S. Gov., Army Air Forces. Specification No. 14135; 1944. Cement; Acrylic Base, for Acrylate Base Plastic.

U. S. Gov., Army Air Forces. Specification No. 14137; 1944. Cement; Cellulose Nitrate Base.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-117a; 1944. Compound; Stripping Ethylcellulose Protective, Hot Dipping.

U. S. Gov., Army-Navy Aeronautical Specification AN-D-14; 1944. Diamyl Phthalate.

U. S. Gov., Army-Navy Aeronautical Specification AN-L-21—2; 1944. Lacquer; Camouflage.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-27—1; 1943. Thinner; Cellulose Acetate Butyrate Dope.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-28—1; 1943. Thinner; Cellulose Acetate Butyrate Dope, Blush Retarding.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-D-551-4; 1944. Dope; Cellulose Nitrate, Clear (for) Aluminum Dope.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-T-256—6; 1944. Thinner; Cellulose Nitrate Dope and Lacquer.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-T-258—3; 1943. Thinner; Cellulose Nitrate Dope and Lacquer, Blush Retarding.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M168; 1940. Protection of Documents With Cellulose Acetate Sheeting. Relative to the lamination of documentary material with cellulose acetate sheeting as a protective measure, a study was made of the quality of various sheetings and of the suitability of the lamination processes used by seven different organizations. Three of the operators used plain sheeting applied with heat and pressure, one used sheeting containing an adhesive and applied the sheeting with heat and pressure, and three used sheeting containing an adhesive and applied the sheeting with pressure at ordinary temperature. The operators used identical papers of four different types. The sheetings were tested for the physical and chemical properties considered of importance relative to laminating quality, resistance to wear, and stability.

U. S. Gov., Treasury Dept., Procurement Div., No.434; 1940. Cement; Adhesive, Cellulose-Base (for Metals, Glass, and Wood). Shall be of one type and grade intended for use as a filler, sealer, or adhesive joining cement; shall be a nonaqueous volatile-solvent cellulose-base material, upon each tube of which a caution or warning should appear, as to inflammability, should the material have a flash point below 86° F. (closed cup). Gives requirement for flexibility of base material and workability and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.489; 1941. Cement; Leather, Cellulose-Base, (for Shoe Soling). Shall be one type and one grade and shall be a cellulose-base volatile-solvent material of suitable brushing consistancy for application. Gives requirements for viscosity, nonvolatile matter, benzol, dilution test, flexibility, and workability and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.490; 1941. Thinner; Leather-Cement (Cellulose-Base). Shall be one type and one grade, and shall be a clear liquid free from sedimentation or suspended matter intended for use in connection with cellulose-base leather cement. Gives requirements for distillation range, neutralization number (acid value), benzol, water, and performance test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 4-1046; 1936. Iso-Propyl Acetate (85 to 88 Percent Grade).

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-176; 1942. Ethyl Cellulose.

846.6 VARNISH GUMS AND RESINS

846.60 General Items

American Gum Importers Assn. Natural Resins. Handbook, 1939. Basic data on the natural resins—their physical and chemical properties, their solubilities in a wide range of paint, varnish, and lacquer solvents and thinners; the compatibility of the natural resins with other resinous products, cellulose derivatives, waxes, pitches, asphalts, drying and nondrying oils; the applications of the resins alone and in combination with other materials in both their original and thermally processed forms.

846.61 Ester Gum

U. S. Gov., Navy Dept. Specification 52G5b; 1945. Gum; Ester.

846.62 Shellac

American Bleached Shellac Manufacturers Assn. General Specifications on the Use and Application of Shellac, 1941. Covers dampness and drying, thinning and mixing. Includes notes on floor finishing, fillers, stains, preparation, and waxing; specifications for floor finishing, pine and other close grains, oak and other open grains, maple, and birch; specifications for finishing interior woodwork, priming coat, natural wood finishes, varnish base, and priming (sizing) walls.

American Bleached Shellac Manufacturers Assn. How To Use Shellac for Best Results, 1941. Instructions on thinning shellac, application to new and to old floors, finishing furniture, and priming and sealing walls and woodwork.

American Bleached Shellac Manufacturers Assn. and U. S. Shellac Importers Assn. Specifications for Dry Bleached Shellac, 1934. For two grades of shellac known as regular and refined. Gives requirements as to iodine number, percent of moisture, wax, ash, and color.

American Bleached Shellac Manufacturers Assn. and U. S. Shellac Importers Assn. Specifications for Orange Shellac, 1934: For grades A, B, C, and D known in the trade as superfine, fine, good, and heart brands; TN pure and pure TN; and TN which may contain up to 3 percent of rosin, respectively. Contains requirements for the four grades as to iodine number, percent of moisture, wax, matter soluble in water, ash, and color.

American Bleached Shellac Manufacturers Assn. and U. S. Shellac Importers Assn. Specifications for Seedlac, 1934. For three grades, namely—Koosmie, Bisacki, and Rangoon. Gives requirements for the three grades as to iodine number, moisture, percent of wax and ash, and color.

American Society for Testing Materials, D 29-40; 1940. Methods of Sampling and Analysis of Shellac. Covers dry shellac and shellac varnish; method for orange shellac, either free, blocky, or matted; bleached shellac; requirements for extraction apparatus for insoluble test and outline of procedure, iodine number and solutions necessary, qualatative tests for rosin and copal, determination of moisture, orpiment in orange shellac, wax, soluble matter, ash, and color. For shellac varnish, color, nonvolatile matter, wax, iodine number, insoluble matter, purity, drying time, volatile matter, and weight.

American Society for Testing Materials, D 29-41T; 1941. Tentative Method of Test for Color of Orange Shellac. For the determination of the color of orange shellac when it is desired that the results be expressed in terms of numerical values. Apparatus, reagents, preparation of color standards, and procedure. This method is in effect a tentative revision of, and is intended to be added, when adopted, to the present American Society for Testing Materials. Standard Methods of Sampling and Analysis of Shellac (D 29-40).

American Society for Testing Materials, D 207-35; 1935. Dry Bleached Shellac. For regular and for refined white shellac that has been treated to be nearly free of wax and matter insoluble in hot alcohol. Gives limiting values for iodine number, matter insoluble in hot solvents, moisture, wax, matter soluble in water, ash, and tests in accordance with A.S.T.M. Method D 29.

American Society for Testing Materials, D 237-43T; 1943. Tentative Specifications for Orange Shellac and Other Lacs. Covers six grades but does not include sticklac and seedlac. Gives requirements for matter insoluble in specified hot solvents, iodine number, moisture, wax, orpiment, matter soluble in water, ash, color, and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Shellac. Covers definition, derivation, constants, solubility, grades, uses, and substitutes.

U. S. Shellac Importers Assn., Inc. American Bleached Shellac Manufacturers Assn., Inc. Official Methods of Analysis, Specifications, and General Information on Shellac and Bleached Shellac, 1934. Includes specifications for orange shellac, seedlac, dry bleached shellac, and shellac varnish; methods of sampling and testing shellac; methods of sampling and testing shellac varnish; and appendix of general information.

U. S. Gov., Federal Specification TT-S-271; 1930. Amendment 1; 1944. Shellac; Orange. Covers the manufactured products derived entirely from stick lac (the secretion of Tacchardia Lacca) freed from most of the lac dye and originally prepared in flake, button, or chip form. Covers three types—(I) orange shellac (grades A, B, C, and D), (II) button-lac, and (III) garnet-lac. Gives requirements for iodine number, matter insoluble in alcohol, moisture and volatile matter, matter soluble in water, wax, ash, and color; methods of inspecting, sampling, and testing; and packaging, packing and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-17A; 1932. Shellac; Orange Gum, White Bleached, Refined Bleached.

References.—Shellac varnishes, *see* 846.11; methods of testing shellac, *see* 846.0, 846.11.

846.63 Resins and Resin Compounds

American Society for Testing Materials, D 269-30; 1930. American Standards Assn., K 21.1-1936. Method of Test for Toluene Insoluble Solid Matter in Rosin (Chiefly Sand, Chips, Dirt, and Bark). Covers the treatment of sample and outlines procedure.

American Society for Testing Materials, D 563-43T; 1943. Tentative Method of Test for Phthalic Anhydride Content of Alkyd Resin Solutions. Covers apparatus required and outlines procedure.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Kauri Gum. Covers definition, constants, solubility, derivation, uses, grades, and containers.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-R-271-1; 1941. Resin; P-Phenyl, Phenol-Formaldehyde.

U. S. Gov., Navy Dept. Specification 52 R 10b; 1943. Resin; Para-Phenyl, Phenol-Formaldehyde.

U. S. Gov., Navy Dept. Specification 52R11; 1944. Resin; Phenolic (Alkyl Phenol, Oil-Soluble).

U. S. Gov., Navy Dept. Specification 52R13; 1944. Resin; Alkyd, Solution.

U. S. Gov., Treasury Dept., Procurement Div., No.456; 1941. Compound; Joint and Thread, High Temperature (Liquid and Paste). Type I, liquid, is intended for high temperature use with smooth joints; and type II, paste, is for high temperature use with rough joints. Composed essentially of suitable resins and a volatile with an inert filler added to type II. Gives requirements for sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-21; 1943. Amendment 1; 1944. Resin; Alkyd, Solution. Covers one type and grade of a linseed oil modified alkyd resin in a volatile petroleum solvent suitable for use in air-drying interior and exterior colored paints and enamels. Gives requirements for appearance, color, odor, flash point, composition of resin solution, specific gravity, acid number, viscosity reduction, compatibility. reactivity with zinc oxide, drying time, water resistance, and safety of working; inspection, sampling, and methods of test; and packaging and marking.

846.7 VARNISH FOR PRINTERS AND LITHOGRAPHERS

U. S. Gov., U. S. Army, Corps of Engineers. Specification; 42.2-2; 1921. Asphaltum; Washout Solution.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-80; 1921. Varnish; 00.

846.9 MISCELLANEOUS VARNISH SPECIFICATIONS

U. S. Gov., Army Air Forces. Specification 14123; 1943. Varnish; Decalcomania, Adhesive.

U. S. Gov., Army Air Forces. Specification 14133-1; 1944. Lacquer; Hot Oil Resistant, for Steel Engine Parts.

U. S. Gov., Army Air Forces. Specification 20029; 1942. Coating; Synthetic Varnish, for Metal Containers.

U. S. Gov., Federal Specification TT-L-58; 1942. Lacquer; Spraying, Clear and Pigmented (General Use). Covers one grade and two types—(I) clear and (II) pigmented. Gives requirements for consistency, color, physical properties, working properties, drying properties, hiding power, and water resistance;

methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52V15d; 1942. Varnish; Mixing, for Aluminum Paint.

U. S. Gov., Navy Dept. Specification 52V17; 1944. Varnish-Ingredient; Phenolic.

U. S. Gov., Navy Dept. Specification 52V18; 1944. Varnish; Mixing, Alkyl-Phenolic.

U. S. Gov., Navy Dept. Specification 52V20; 1944. Varnish; Mixing, Linseed Oil-Phenyl-Phenolic Resin.

U. S. Gov., Navy Dept. Specification 52V21; 1944. Varnish; Mixing, Linseed Oil-Alkyl-Phenolic Resin.

U. S. Gov., U. S. Army, Army Air Forces. Specification 3-163; 1935. Lacquer, for Landing Light Reflectors.

U. S. Gov., U. S. Army, Army Air Forces. Specification 3-168; 1937. Lacquer; Acid Proof (for Integrally Shielded Storage Batteries).

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1096A; 1940. Sandarac Varnish.

U. S. Gov., U.S. Army, Medical Dept. Specification 10-2451; 1938. Lacquer for Casts.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2545; 1939. Varnish for Silicate Cement.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-167; 1937. Varnish; Phenol-Formaldehyde Resin.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-106; 1942. Varnish; Special, for Use in Ammunition.

References.—Electrical insulating varnishes, *see* 719.57.

847. BRONZE POWDERS AND VEHICLES

847.1 ALUMINUM BRONZE

American Assn. of State Highway Officials, M69-42. Standard Specifications for Aluminum Paint (Paste-Mixing Vehicle). Covers aluminum paste, mixing vehicle, and aluminum paint for steel structures. Gives paste, mixing vehicle, aluminum paint, packing and marking, and methods of analysis.

American Hospital Assn., 4-6. Mixing Varnish for Aluminum Paint. Covers two types—(I) for priming wood and (II) for general use; and two classes—(A) for powder and (B) for paste. Based on U. S. Gov. Specifications TT-V-81a, and Amendment 1, for Varnish, Mixing (for) Aluminum Paint (referred to below); TT-A-466, and Amendment 1, for Aluminum-Pigment-Paste, (for) Paint; and TT-A-476 and Amendment 3, for Aluminum-Powder, (for) Paints (Aluminum-Bronze-Powder).

American Society for Testing Materials, D 266-41; 1941. Aluminum Powder for Paints (Aluminum Bronze Powder). Covers two types of aluminum powder, commercially known as aluminum bronze powder, for use in paints: Type A, standard fineness, for general paint use; type B, extra fine, for special uses. Composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 474-41; 1941. Aluminum Pigment Paste for Paint. Covers two types of aluminum pigment paste for use in paints: Type A, standard fineness, for general paint use; Type B, extra fine "lining," for special finishes. Composition and properties, number of tests, and methods of test.

American Society for Testing Materials, D 480-44; 1944. Methods of Sampling and Testing Aluminum Powder and Paste. Cover the procedure for sampling, qualitative analysis, and physical testing of aluminum powder and aluminum paste for paint. Sampling, qualitative analysis, leafing properties, brushing, smoothness, luster, and general appearance; coarse particles, easily extracted fatty and oily matter, stability, and nonvolatile matter.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 200-43; 1944. Aluminum Paint Suitable for Finishing Coats on Steel Structures. Gives purpose, tender, material, paint, paste, vehicle, glycerol-phthalate resin base varnish, phenolic resin base varnish, mixing, application, inspection, packing, marking, and warranty.

Society of Automotive Engineers. Aeronautical Material Specification 2450A; 1944. Sprayed Metal Finish (Aluminum). For air-cooled cylinder assemblies but may be used on other parts where applicable. Gives requirements for preparation, application, quality, corrosion resistance, and approval. Similar Specification: Army-Navy Aeronautical AN-M-8.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-A-461a; 1943. Aluminum-Pigment-Paste; Aircraft.

U. S. Gov., Federal Specification TT-A-468; 1942. Amendment 1; 1944. Aluminum-Pigment; Powder and Paste, (for) Paint. Covers two types—(I) powder and (II) paste; two classes—(A) for general paint use and (B) for special finishes; and two grades—(I) made from purest aluminum and (II) made from secondary aluminum. Gives detail requirements for each type, class, and grade; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-V-81a; 1939. Amendment 2; 1943. Varnish; Mixing (for) Aluminum Paint. Covers two types—(I) 120 percent Kauri reduction (for priming wood) and (II) 75 percent Kauri reduction (for general use); and two classes—(A) for aluminum powder and (B) for aluminum paste. Gives requirements for color, viscosity, working properties, and composition; methods of sampling and testing; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 355; 1939. Paint; Glyceryl Phthalate, Marine, Exterior, Aluminum. Shall consist of a pigment paste and a mixing vehicle, free from toxic ingredients. To be used as a top coat over properly primed metal surfaces and as a primer or top coat over exterior wood surfaces. Gives chemical composition and physical properties of paste and vehicle; details of mixed paint including leafing properties, weight per gallon, hiding properties, drying properties, working properties, and surface and self-lifting properties; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Spar varnish for making aluminum paint, *see* 846.21; methods of testing varnish, *see* 846.0; safety codes, definitions, colors, *see* 840.2-840.4.

847.2 GOLD BRONZE

American Society for Testing Materials, D 267-41; 1941. Gold Bronze Powder. Commercially known as gold bronze, pale gold bronze, and rich gold bronze powders. Composition and properties, number of tests, and methods of test.

847.3 COPPER BRONZE

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Bronze Powder. Covers definition, constants, derivation, grades, uses, containers, and substitutes.

847.4 BRONZING LIQUID

References.—Spar varnish for making aluminum paint, *see* 848.21.

848. OILS AND THINNERS FOR PAINTS AND VARNISHES

848.0 GENERAL ITEMS

American Oil Chemists' Society. Standard Methods for the Sampling and Analysis of Commercial Fats and Oils, 1943. Applies to fats and fatty oils used in the soap, candle, and tanning industries; to edible fats and oils; to fats and fatty oils intended for lubricating and burning purposes; and to the raw oils used in the varnish and paint industry, but not intended for waxes. Covers sampling; analysis for moisture and volatile matter, insoluble impurities, soluble mineral matter, fatty acids combined as mineral soap, free fatty acids, titer, unsaponifiable matter, iodine number, saponification number, melting point, softening point, slipping point, flow test, cloud test, bleach test, Halphen test (for cottonseed oil), modified Vallavecchia test, Reichert-Meissl and Polenske numbers, Kirschner value, index of refraction, specific gravity, acetyl and hydroxyl value, smoke, flash and fire points, F.A.C. standard colors, modified Wiley melting point method, thiocyanogen method, and Twitchell method.

American Society for Testing Materials, D 268-44; 1944. Methods of Sampling and Testing Lacquer Solvents and Diluents. Cover procedures for the sampling and testing of solvents and diluents for use in the manufacture of nitrocellulose lacquer. For specimen from loaded tank car or other large vessel and from barrels and drums; determination of specific gravity, color comparison, distillation test, nonvolatile matter, residual odor, water, acidity, alkalinity, ester value, copper corrosion and mercury corrosion tests, sulfur, dimethylketone, potassium permanganate test, flash point, volatile matter, and free phenols in tricresyl phosphate.

American Society for Testing Materials, D 268-44T; 1944. Tentative Method of Test for Water in Lacquer Solvents and Diluents. For determination of water present in any proportion in most organic liquids, such as lacquer solvents and diluents. Gives principle of test, reagents, standardization of reagent, sample, procedure, and calculation.

American Society for Testing Materials, D 361-36; 1936. Industrial 90 Percent Benzene (Benzol). Covers limiting values for specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and sulfur as H_2SO_4, with requirements for tests in accordance with A.S.T.M. Method D 268.

848.1 LINSEED OIL

848.11 Raw Linseed Oil

American Hospital Assn., 4-31. Raw Linseed Oil. Covers the grade of raw linseed oil for use in paint. Based on U.S. Gov. Federal Specification JJJ-O-336.

American Society for Testing Materials, D 234-28; 1928. American Assn. of State Highway Officials, M 125-42. American Standards Assn., K34-1937. Raw Linseed Oil. For pure oil pressed from flaxseed, limiting values for specific gravity, acid number, saponification number, unsaponifiable matter, iodine number, loss on ignition, color, and foots, using A.S.T.M. Method D-555 for testing.

U. S. Gov., Federal Specification JJJ-O-336; 1931. Oil; Linseed, Raw. Covers the grade of raw linseed oil for use in paint; and two types—(A) normal iodine number and (V) high iodine number. Gives requirements for foots, specific gravity, acid number, saponification number, unsaponifiable matter, iodine number, loss on heating, and color; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Amendment 2; 1943, changes iodine number and requirements applicable to Navy Dept. purchases.

References.—Linseed oil for medical purposes, *see* 813.5; methods of testing varnish and paint oils, *see* 848.0; methods of testing vegetable oils, *see* 142.0.

848.12 Boiled Linseed Oil

American Hospital Assn., 4-28. Boiled Linseed Oil. Covers the grade of boiled linseed oil for use in paints. Based on U. S. Gov. Federal Specification JJJ-O-331.

American Society for Testing Materials, D 260-33; 1933. American Assn. of State Highway Officials, M 126-42. American Standards Assn., K35-1937. Boiled Linseed Oil. For pure linseed oil treated by heating and incorporating compounds of lead or other suitable drying metals; requirements for specific gravity, acid number, saponification number, unsaponifiable matter, iodine matter, loss on heating, time of drying, ash and lead, using A.S.T.M. Method D-555 for testing.

U. S. Gov., Federal Specification JJJ-O-331; 1931. Oil; Linseed, Boiled. Covers the grade of boiled linseed oil for use in paints; and two types—(A) kettle-boiled and (B) quick process. Gives requirements time of drying, loss on heating, specific gravity, acid number, saponification number, unsaponifiable matter, ash, and lead; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 52-O-17; 1944. Oil; Linseed, Alkali-Refined.

References.—Linseed oil for medical purposes, *see* 813.5; methods of testing varnish and paint oils, *see* 848.0; methods of testing vegetable oils, *see* 142.0.

848.2 CHINA WOOD OIL (TUNG OIL)

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Tung Oil. Gives table showing recommended standard for tung oil.

American Society for Testing Materials, D 12-41; 1941. Raw Tung Oil. Sampling during loading of tank cars or filling of containers for shipment, from loaded tank cars or large vessels, and from barrels or drums; and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Tung Oil (China Wood Oil). Covers definition, constants, derivation, uses, impurities, forms available, supply, and substitutes.

New York Produce Exchange. Vegetable Oils, Waxes, and Fats. Bulk Oil Section. China Wood Oil. Gives requirements for allowance for moisture, purity of oil, and analysis.

New York Produce Exchange. Vegetable Oils, Waxes, and Fats, 1924. China Wood Oil. For commercially prime oil. Gives requirements for color, foots, dirt, moisture, total impurities, and heat or coagulation test.

U. S. Gov., Army-Navy Aeronautical Specification AN-JJJ-O-354; 1941. Oil; Tung (Chinawood), Raw.

U. S. Gov., Federal Specification JJJ-O-353; 1943. Oil, Tung (China Wood), Raw. Covers one grade intended for use in the manufacture of paints and varnishes. Gives requirements for specific gravity, acid number, saponification number, unsaponifiable matter, refractive index, iodine number, heating test, foots, loss on heating, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of testing, *see* 848.0, 142.0.

848.3 SOYBEAN OIL

References.—Soybean oil, *see* 143.2.

848.4 PERILLA OIL

American Oil Chemists' Society. Recommended Standards for Various Oils, 1943. Perilla Oil. Gives table showing recommended standard for perilla oil.

American Society for Testing Materials, D 125-41; 1941. Perilla Oil, Raw or Refined. Specific gravity, acid number, saponification number, unsaponifiable matter, iodine number, loss on heating, color, foots, and methods of testing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Perilla Oil. Covers definition, constants, solubility, derivation, uses, impurities, forms available, supply, and substitutes.

New York Produce Exchange. Vegetable Oils, Waxes, and Fats, 1924. Perilla Oil. Shall be pure and filtered or settled oil. Gives requirements for country of origin and allowable moisture and impurities.

References.—Methods of testing, *see* 848.0, 142.0.

848.5 FISH OIL

References.—Cod liver oil, *see* 813.2.

848.6 Turpentine

American Hospital Assn., 4-55. Gum Spirits and Wood (Steam-Distilled and Sulphate) Turpentine for Paint. Covers one grade only for the three kinds. Based on U. S. Gov. Federal Specification LLL-T-791b.

American Hospital Assn., 4-58. Wood (Destructively-Distilled) Turpentine for Paint. Covers one grade. Based on U. S. Gov. Federal Specification LLL-T-792a.

U. S. Gov., Federal Specification LLL-T-791b; 1941. Turpentine; Gum Spirits and Wood (Steam-Distilled and Sulphate), for Paint. Covers one grade. Gives requirements for appearance, color, odor, and basis of purchase; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification LLL-T-792a; 1941. Turpentine; Wood (Destructively Distilled), for Paint. Covers one grade—in Interstate Commerce. Gives requirements for appearance, color, odor, and basis of purchase; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Turpentine, *see* 211.1.

848.7 TURPENTINE SUBSTITUTES, MINERAL SPIRITS

American Society for Testing Materials, D 235-39; 1939. American Assn. of State Highway Officials, M 128-42. Petroleum Spirits (Mineral Spirits). Apply only to petroleum distillates. Requirements for appearance, color, flash point, blackening, distillation, dry point, and acidity of distillation residue, using tests by A. S. T. M. methods.

U. S. Gov., Federal Specification TT-T-291; 1931. Thinner; Paint, Volatile Mineral Spirits. Covers that grade of petroleum distillate known as mineral spirits or petroleum spirits for use in paint. Gives requirements for color, appearance, and other properties; methods of sampling, testing, and basis of purchase; and requirements for packaging, packing, and marking.

References.—Definitions, methods of testing, *see* 502.2, 503.0.

848.9 MISCELLANEOUS OIL AND THINNER SPECIFICATIONS

American Society for Testing Materials, D 364-36; 1936. Industrial Xylene (Xylol) or Solvent Naphtha. Covers values for specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, sulfur as H_2SO_4, copper corrosion test and mercury test, using test procedures of A. S. T. M. Method D 268.

American Society for Testing Materials, D 601-41 T; 1941. Tentative Specifications for Oiticica Oil (Permanently Liquid). Properties and methods of testing.

American Society for Testing Materials, D 740-43T; 1943. Tentative Specifications for Methyl Ethyl Ketone. Gives requirements for purity, specific gravity, color, distillation range, nonvolatile matter, odor, water, acidity, and methods of testing.

American Society for Testing Materials, D 801-44 T; 1944. Tentative Methods of Sampling and Testing Dipentene. Covers scope, sampling, detection and removal of separated water, appearance, color, odor, specific gravity, refractive index, distillation, polymerization, spot test, copper corrosion, flash point, and moisture.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-5; 1942. Methyl-Ethyl Ketone.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-8b—2; 1943. Thinner; Toluene Substitute.

U. S. Gov., Army-Navy Aeronautical Specification AN-LLL-D-386; 1941. Dipentine.

U. S. Gov., Federal Specification TT-O-356a; 1943. Oil; Flatting and Mixing (for Thinning White-Lead-Paste and similar Paste Paints). Covers one grade and two classes—(1) flatting oil (for flat finishes) and (2) mixing oil (for low gloss finishes). Gives requirements for color, nonvolatile matter, drying properties, acid number, toughness, and mixing test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification TT-O-371; 1943. Amendment 2; 1944. Oil; Linseed—Replacement (for Thinning Paints and Pastes in Oil). Covers one grade and two types—(I) driers added and (II) no driers added. Gives requirements for material, appearance, color, viscosity, nonvolatile matter, acid number, drying properties, toughness, dilution and absorption test; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-T-266; 1942. Amendment 4; 1944. Thinner; Lacquer. Covers one type and one grade. Gives requirements for specific gravity, distillation range, content (esters, hydrocarbons, ketones, and alcohols and ethers), nonvolatile matter, odor, color, water, sulfur, acid value, copper corrosion, and benzol; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 52D8a; 1944. Dipentine.

U. S. Gov., Navy Dept. Specification 52K1; 1944. Ketone; Methyl-Ethyl.

U. S. Gov., Navy Dept. Specification 52-O-19; 1944. Oil; Varnish.

U. S. Gov., Navy Dept., Specification 52T9; 1944. Thinner; Paint, Petroleum-Spirits.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Mixing Oil, 1938.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-176; 1943. Thinner, for Synthetic Enamels.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 3-180; 1943. Thinner; Naphtha, Low-Boiling.

U. S. Gov., Veterans Administration. Specification VA-X-65c; 1941. Thinner; Paint Brushing Lacquer.

References.—Methods of testing, *see* 848.0, 142.0, 502.2, 503.0.

849. MISCELLANEOUS MATERIALS RELATING TO PAINTS AND PRESERVATIVE COATINGS

849.1 PAINT DRIERS

849.11 Japan Driers

849.19 Miscellaneous Paint Driers

American Society for Testing Materials, D 600-43; 1943. Liquid Paint Driers. Covers metallic driers in liquid form for use in paints and similar finishing materials. Covers two classes—(A) driers of the resinate or linoleate types, dispersed in oils, resins, and petroleum spirits or turpentine; and (C) driers of the newer soluble type, which are metallic salts of several types of organic acids, dispersed in suitable media, and usually free of resins. Gives requirements for composition and properties and methods of testing.

U. S. Gov., Army-Navy Aeronautical Specification AN-TT-D-643; 1941. Driers; Naphthenate, Liquid, Concentrated.

U. S. Gov., Federal Specification TT-D-651a; 1942. Drier; Paint, Liquid. Covers two types—(I) lead and manganese and (II) cobalt (lead-free). Gives requirements for color, flash point, nonvolatile matter, volatile matter, ash, action with linseed oil, and drying properties; methods of sampling, testing, and basis of purchase; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 52 D 7; 1942. Driers; Naphthenate, Concentrated, Liquid.

U. S. Gov., U. S. Maritime Commission. Specification 52-MC-15; 1942. Drier; Paint, Liquid. Covers one grade in four types—(I) cobalt solution, (II) manganese solution, (III) lead solution, and (IV) zinc solution. Gives requirements for color, composition, appearance, flash point, viscosity, and drying power; inspection, sampling, and methods of test; and packaging and marking.

References.—Methods of testing, *see* 848.0, 142.0, 502.2, 503.0.

849.2 WOOD FILLERS AND OTHER FILLING MATERIALS

U. S. Gov., Army Air Forces. Specification 14115; 1942. Surfacer; Wood, Liquid.

U. S. Gov., Federal Specification TT-F-336a; 1941. Filler; Wood, Paste. Covers one grade and type. Gives requirements for material, workmanship, and working properties; methods of sampling and testing; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-S-171; 1942. Sealer; Floor Lacquer-Type (for Oiled Wood Floors). To provide satisfactory foundation for a finishing material such as varnish, liquid or paste wax, or water emulsion wax. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-S-176a; 1941. Amendment 1; 1944. Sealer; Floor, Varnish-Type (for Wood and Cork). Covers one grade and two classes—(I) minimum nonvolatile content 40 percent and (II) minimum nonvolatile content 25 percent. Gives requirements for nonvolatile matter, set to touch, dry hard and tough, water test, toughness, flashpoint, viscosity, odor, and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.597; 1943. Filler; Crack and Seam, Paste. Shall be furnished in one type and in one grade. Intended for use in filling cracks in wood, metal, and cement, but not for expansion joints or calking. Gives requirements for material, color, sagging, adhesion, and hardening; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 52C25; 1944. Cement; Smoothing (Formula No.62).

U. S. Gov., Navy Dept. Specification 52F1c; 1925. Wood-Filler; Liquid.

U. S. Gov., Navy Dept. Specification 52W4a; 1937. Wood-Substitute; Plastic, and Solvent-Fluid.

References.—Priming paints, *see* 844.4.

849.3 PUTTY

American Society for Testing Materials, D 317-33; 1933. Pure Linseed Oil Putty for Glazing. Covers whiting putty and white lead whiting putty, requirements for manufacture, composition of dry pigment, properties of finished putty as regards amount of pigment, linseed oil, moisture, alkalinity, coarse particles, and plastic quality.

U. S. Gov., Federal Specification TT-P-781a; 1941. Putty and Elastic-Compound; (for) Metal-Sash Glazing. Covers two types of glazing materials, of the so-called knife-grade, for interior and exterior exposure. Gives requirements for composition and working properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-P-791a; 1938. Putty; Pure Linseed Oil, (for) Wood-Sash Glazing. Covers two types for general use on wood sash, interior and exterior exposure—(I) whiting putty and (II) white lead-whiting putty. Gives requirements for pigment, whiting, composition, vehicle, and working qualities; methods of sampling and testing; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification TT-T-P-791a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for pigment.

U. S. Gov., Navy Dept. Specification 52P15; 1928. Putty; Spotting, White.

References.—White lead for putty, *see* 842.64; ceramic whiting, calcium carbonate, *see* 546, 833.3; linseed oil, *see* 848.1; method of testing putty, *see* 840.5.

849.4 PAINT AND VARNISH REMOVERS

U. S. Gov., Army Air Forces. Specification 14119-2; 1944. Remover; Paint, for Aircraft Finishes.

U. S. Gov., Federal Specification TT-R-251a; 1942. Amendment 2; 1944. Remover; Paint and Varnish, Organic-Solvent Type. Covers two types—(I) flammable and (II) nonflammable. Gives requirements for material, condition in container, nonvolatile matter, ash, loss by evaporation, performance test, stability, alkalies, mineral acids, carbon tetrachloride, retardant residue, effect on wood, and nonflammability; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 52R12; 1941. Remover; Paint and Varnish, Noninflammable Type.

849.5 GOLD LEAF

References.—Gold bronze powder, *see* 847.2.

849.6 WATERPROOFING COMPOUND FOR TEXTILES AND OTHER FABRICS

Society of Automotive Engineers. Aeronautical Material Specification 361C; 1942. Plastic Film—Transparent, Moisture Resistant. For use in fabrication of envelopes or bags for enclosing aircraft engines and/or spare parts preparatory to shipment or storage. Covers requirements for physical properties, test procedures, quality, approval, and rejections. Similar to U. S. Gov., Navy Dept., Bureau of Aeronautics Specification AN-O-P-406.

U. S. Gov., Navy Dept. Specification 27W3; 1928. Waterproofing-Process for Textiles.

U. S. Gov., Navy Dept. Specification 52C29; 1944. Cement; Synthetic, for Hard Cellular Buoyancy-Material.

U. S. Gov., Treasury Dept., Procurement Div., Specification 277b; 1943. Covers Typewriter; Fabric. Shall be fabric coated with a suitable nonoxidizing plastic material. Grade shall be commercially known as "first" and sizes shall be as specified. Gives requirement for material, workmanship, coating, water permeability, color and finish, and flexibility of coating; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 3-138-A; 1942. Compound; Waterproofing (for Fabrics).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-48A; 1943. Compound; Adhesive, Waterproof.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-76; 1931. Waterproofing Compound.

References.—Asphalt for waterproofing, *see* 505.16; waterproofing of raincoats, *see* 392.54; fabric waterproofed with asphalt, *see* 392.4; varnished cloth and tape for electrical purposes, *see* 719.56, spar varnish, electrical insulating varnish, *see* 846.21, 719.57.

849.7 WATER COLORS

U. S. Gov., Army Air Forces. Specification 14057-C; 1939. Paint; Water, Dry.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-6; 1922. Box; Water Color, Colors, Water.

849.8 METAL CEMENT PIGMENTS

849.9 MISCELLANEOUS MATERIALS RELATING TO PAINTS NOT ELSEWHERE CLASSIFIED

American Society for Testing Materials, D 363-36; 1936. Tricresyl Phosphate. Limiting values for specific gravity, color, volatile matter, free phenols, potassium permanganate test, ester value, odor, water, and free acid; with methods of test in accordance with A.S.T.M. Method D 268.

American Society for Testing Materials, D 608-43; 1943. Dibutylphthalate. Gives requirements for specific gravity, appearance, color, odor, water, acidity, ester value, and methods of testing.

U. S. Gov., Army Air Forces. Specification No. 14127; 1944. Paste; Masking.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-39; 1944. Fluid; Parachute Marking.

U. S. Gov., Navy Dept. Specification 52P60; 1944. Polymerization-Product of an Organic Dihalide and an Inorganic Polysulphide (Powder).

U. S. Gov., Navy Dept. Specification 52T12; 1944. Tricresyl Phosphate.

U. S. Gov., U. S. Maritime Commission. Specification 31-MC-1; 1944. Tape; Luminescent, Phosphorescent, Adhesive-Backed. Covers one type and one grade. Gives Requirements for materials, workmanship, construction, uniformity, color, base material, pressure-sensitive adhesive backing, luminescent material, brightness, flexibility, stability, and resistance to elevated temperature; inspection, sampling, and methods of test; and packaging and marking.

850-859 FERTILIZERS AND FERTILIZER MATERIALS

850. GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Fertilizers. Official methods for sampling, preparation of sample and of reagents, determination of moisture, of total phosphoric acid, water-soluble and citrate-insoluble phosphoric acid, organic and ammoniacal nitrogen only, total nitrogen, nitric and ammoniacal nitrogen, water insoluble organic nitrogen, potash.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Bone; Raw (Granulated Bone, Bone Meal). Covers definition, derivation, uses, grades, containers, and substitutes.

References.—Other definitions, *see* 851, 852, and 859.

851. NITROGENOUS FERTILIZER MATERIALS

U. S. Gov., Treasury Dept., Procurement Div., 617a; 1944. Sodium Nitrate (Nitrate of Soda), for Fertilizer Purposes. Covers one type and one grade in granular or pellet form. Gives requirements for nitrogen content, moisture and other volatile matter, water-insoluble matter, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Methods of analysis, *see* 850.

852. PHOSPHATE FERTILIZER MATERIALS (ROCK)

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Phosphate Rock (Tennessee), Sample 56a, and Phosphate Rock (Florida), Sample 120. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

853. SUPERPHOSPHATES (ACID)

U. S. Gov., Treasury Dept., Procurement Div., No. 671; 1944. Superphosphate, for Fertilizer Purposes. Covers one type and one grade, free from hard caking. Gives requirements for available phosphoric acid content (P_2O_5); methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

854. PREPARED FERTILIZER MIXTURES

U. S. Gov., Treasury Dept., Procurement Div., No. 634; 1943. Fertilizer; Commercial, Mixed. Grades shall be as specified in the invitation for bids. Gives requirements for material, nitrogen, phosphoric acid, potash, grade, composition, filler, condition, nonacid forming, and state laws; methods of sampling, inspection, and tests; and packing and marking.

References.—Methods of analysis, see *850*.

855. POTASH FERTILIZER MIXTURES

U. S. Gov., Treasury Dept., Procurement Div., No. 670; 1944. Potassium Chloride (Muriate of Potash) for Fertilizer Purposes. Covers one grade suitable for the purpose intended. Gives requirements for potash content (calculated as K_2O) and water insoluble matter; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

859. MISCELLANEOUS FERTILIZER SPECIFICATIONS

Assn. of Official Agricultural Chemists. Definitions Relating to Liming Materials, 1944. The word lime when applied to liming materials means either calcium oxide or calcium and magnesium oxides. Gives definitions for about 16 different types of liming materials.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Agricultural Liming Materials; Tentative Method.

U. S. Gov., Treasury Dept., Procurement Div., No. 680; 1944. Ammonium Sulfate, for Fertilizer Purposes. Covers one type and one grade in crystalline form. Gives requirements for ammonia content and acid content; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.— Lime, *see* 517.2; muriate of potash, *see* 832.4; nitrate of soda, *see* 834.2; nitrate of potash, sulphate of potash, and sulphate of potash-magnesia, *see* 832.4.

860-869 EXPLOSIVES, FIREWORKS, AND AMMUNITION

860. GENERAL ITEMS

Institute of Makers of Explosives. American Table of Distances, 1939. Specifies distances to be maintained between storage magazines for explosives and inhabited buildings, public railways and public highways.

Institute of Makers of Explosives. Pamphlet 17. Safety in the Handling and Use of Explosives, 1940. Covers blasting falls of rock, "dont's," firing shots, handling misfires, loading bore holes, making and handling primers, opening cases of explosives, organization of operations, prevention of misfires, primacord, returning to the face, secondary blasting, storage, tamping bore holes, and transportation.

Institute of Makers of Explosives. Suggested Ordinance for Cities, 1926. This recommendation covers definitions and classifications of explosives, of magazines, and gives general regulations; permits required for use, sale, and manufacture; distance tables for various quantities and classes of explosives, for operation under permits, construction of magazines, inspections, etc.

Institute of Makers of Explosives. Suggested State Law Relating to the Manufacture, Storage, and Transportation of Explosives, 1926. This recommendation covers definitions, prohibitions, and exceptions; quantity and distance table for various classes of explosives; separation of magazines, containers, classes of magazines; use of blasting caps, manufacture, license, transportation, firearms, etc.

Mine Inspectors' Institute of America. American Standards Assn., M14-1930. Use of Explosives in Bituminous Mines. Recommended practice on type and size of firing cable, handling and storing explosives on surface and underground, transportation, opening of cases, methods and precautions for charging holes and firing, including inspection.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Suggested Explosives Ordinance for Cities. Prescribes rules and regulations for having, keeping, storage, sale, transportation, and use of explosives.

U. S. Gov., Federal Specification W-B-411; 1941. Amendment 1; 1943. Blasting-Apparatus (Machines; Blasting, Galvanometers and Rheostats for Testing Blasting Circuits and Machines). Covers one grade in three types—(I) galvanometers for testing blasting circuits; (II) blasting machines, in four classes—(A) 10-cap capacity, (B) 30-cap capacity, (C) 50-cap capacity, and (D) 100-cap capacity; and (III) rheostats for testing blasting machines. Gives requirements for each type and class; methods of inspection and tests; and packing and marking for shipment.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Freight. Includes definitions of explosives and dangerous articles other than explosives, accepted and forbidden, for transportation by common carriers by rail freight, rail express, highway, or water. Classification of explosives as—class A, dangerous explosives (ammunition for cannon, ammunition-nonexplosive, ammunition-projectiles, grenades, bombs, mines, and torpedoes, ammunition for small arms with explosive bullets, explosive chemical ammunition, black powder and low explosives, high explosives, and initiating or priming explosives); class B, less dangerous explosives (ammunition for cannon with empty, sand-loaded, or solid projectiles or without projectiles, fireworks, and smokeless powder); and class C, relatively safe explosives (ammunition for small arms, blasting caps, cordeau detonat, fuses, igniters, primers, safety fuse, and toy caps). Classification of dangerous articles other than explosives as—inflammable liquids, inflammable solids, and oxidizing materials; acids and other corrosive liquids, compressed gases, and poisonous articles—class A, extremely dangerous poisons; class B, less dangerous poisons; and class C, tear gas or irritating substances. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Navy Dept., Coast Guard, 1941. Explosives or Other Dangerous Articles on Board Vessels. Covers regulations governing the transportation, storage, stowage, or use of explosives or other dangerous articles or substances, and combustible liquids on board vessels.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-71-48; 1937. Blasting Machine; 100-Cap, Commercial.

References.—Storage of motion picture films, *see* 518.50.

861. POWDER

U. S. Gov., Navy Dept. Specification 4P3a; 1939. Powder; Black, Navy.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-2A; 1934. Powder; Smokeless, for Cartridges, Caliber .50, M1.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-3B; 1943. Powder; Cannon, Smokeless, FNH and NH.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-4A; 1930. Propellant Powder, for 4-In. Trench Mortar.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-5A; 1942. Powder; Propellent, 81 Mm., Mortar (for Ignition Cartridges).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-6; 1939. Powder; Smokeless, Pyrocellulose.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-9A; 1930. Smokeless Powder, for Caliber .30 Service Ammunition.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-11A; 1934. Powder; Smokeless, for Cartridges, Caliber .45, M1911.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-14; 1942. Powder; Propellant, 60 Mm. Mortar (for Ignition Cartridges).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-15; 1942. Powder; Propellant, for Ground Signals.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-12-16; 1942. Powder; Propellent, 4.2-In. Chemical Mortar.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-8B; 1943. Powder; E.C., for Blank Cartridges and Fragmentation Hand Grenades.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-14-1B; 1934. Powder; Black, Army.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-14-4; 1933. Powder; Black, Sodium Nitrate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-14-7B; 1942. Pellet; Black Powder.

References.—Permissive explosives and blasting machines, *see* 860; use of explosives in mines, *see* 860.

862. DYNAMITE AND OTHER HIGH EXPLOSIVES

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-71; 1938. Transportation and Storage of Dynamite. Instructions limited to handling of dynamite from gang headquarters to the job, and overnight storage. Includes general properties, requirements for supervision, precautions to be observed, laws and ordinances governing transportation, and destruction of surplus material.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Dynamite. Covers definition, types, grading, containers, shipping regulations, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Explosives, Commercial. Covers definition, and (I) high explosives, general characteristics, types, grades, and uses; (II) black blasting powder, definition, grades, and containers; and (III) blasting supplies.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Pyroxylin (Soluble Guncotton). Description, solubility, ash, water-soluble substances, and storage. U.S.P. products of pyroxylin—Collodium, Collodium Flexile.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Dynamite, 1942. Sodium nitrate, sixty percent.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Dynamite, 1943. Forty percent ammonia gelatin.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 50-13-13A; 1941. Explosive; TNT, Blocked.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 50-13-14A; 1942. Explosive; Demolition, Nitrostarch, Compressed.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-7B; 1943. Nitroglycerin.

References.—Nitroglycerine in tablets, medicinal, *see* 819.9; cellulose acetate and nitrate products, *see* 846.5; picric acid, medicinal, *see* 802.1; metallic cartridges, loaded paper shot shells, *see* 619.1; permissive explosives, recommended use of explosives in mines, *see* 860.

863. TRACK TORPEDOES AND FUSES

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Div., Operating Section. Circular O-143; 1941. Specifications for Standard Track Torpedoes. Gives requirements for metal parts, physical requirements, attachments, and composition.

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Div., Operating Section. Circular O-151; 1942. Specifications for Standard Five Minute Red Fusee. Gives requirements for size, material, strength, color, plug, head, cap, striking composition, burning qualities, composition, and temperature of ignition.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 360. Torch; Railroad Fusee.

864. FUSES, DETONATORS, AND FIRING DEVICES

U. S. Gov., Treasury Dept., Procurement Div., 299a; 1938. Caps; Blasting (Exploders), Electric and Fuse, Hexanitromannite-Type. Shall be of the improved type which provides a greater factor of safety in handling and use than the usual fulminate of mercury and similar types. Two classes of blasting caps—(A) electric and (B) fuse. Gives requirements for material, workmanship, strength, deterioration, wrapping, lead wire for electric caps, and fuse; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-8B; 1944. Lighter; Fuse, Friction Type, M1.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-10A; 1943. Cord; Detonating (Petn).

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-15; 1943. Firing Device; Release Type, M-1.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-17; 1943. Firing Device; Pull Type, M-1.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-18; 1943. Firing Device; Pressure Type, M-1A1.

865. FIREWORKS

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Model State Fireworks Law. Regulations of the State Fire Marshal for the public display of fireworks.

866. AMMUNITION

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-0-2; 1933. Ammunition; General Specifications, Small Arms.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-5-1B; 1942. Cartridge; Shotgun, 12-Gage.

867. POWDER FOR FUSES, PRIMER DETONATORS, FLARES, AND PYROTECHNICS

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-6B; 1942. Mercury Fulminate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-11A; 1937. Pentaerythrite Tetranitrate (PETN).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-13-12B; 1943. Lead Azide.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-14-5A; 1941. Quickmatch.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-14-6; 1939. Powder; Fuze.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-14-10; 1942. Powder; Black, Slow Burning.

868. CHEMICALS NOT OTHERWISE CLASSIFIED FOR USE IN MANUFACTURING PYROTECHNICS, EXPLOSIVES, AND AMMUNITION

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-30C; 1943. Dimethylaniline.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-58C; 1943. Strontium Nitrate; Anhydrous.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-61A; 1941. Dibutylphthalate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-62; 1936. Strontium Oxalate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-63A; 1943. Strontium Carbonate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-64A; 1939. Strontium Peroxide.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-72A; 1943. Lanolin; Anhydrous (for Use in Ammunition).

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-75; 1936. Triacetin, Glyceryl Triacetate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-90; 1937. Cement; Nitrocellulose, for Use in Ammunition.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-91; 1938. Diethylphthalate.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-92; 1939. Cellulose Acetate, for Use in Propellent Powder.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-94; 1940. Mononitronaphthalene.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-97; 1941. Hexachlorbenzene.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-107; 1942. Dinitromethylaniline.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-109; 1942. Manganese Dioxide.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-14-2A; 1939. Nitrocellulose; Long Fiber.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-14-3C; 1943. Nitrocellulose.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 57-25A; 1942. Silicon; Refined.

869. MISCELLANEOUS EXPLOSIVES, FIREWORKS, AND AMMUNITION

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.59. Bomb; Test-Smoke.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.60. Bomb; Fire-Starting.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-138. Flame Thrower.

870-879 SOAPS, COSMETICS, AND TOILET PREPARATIONS

871. SOAPS AND OTHER DETERGENTS

871.0 GENERAL ITEMS

American Hotel Assn. Soaps and Cleaning Methods for Hotels, 1944. Discusses importance of proper cleaning: Part I—soaps, cleaning compounds, and solutions; covers importance of soft water, calcium hardness, magnesium hardness, soap destruction, table of water softeners, how hard water is made soft, waters throughout the country, cleansing or detergent action of soap, soap moisture content, and types of soap; part II—cleaning methods; covers painted walls and woodwork, cleaning and polishing hardwood floors, cleaning painted wood floors, cleaning methods for marble, effect of scouring grits, soap and water, how to remove stains from marble; cleaning and treatment of floors, bath tubs and wash basins, bathroom fittings, carpet and rug renovation, wet or shampooing process for upholstery, renovation of sandstone, caenstone and granite, resurfacing process, cleaning and polishing furniture and woodwork, and cleaning wall paper; and part III—stain removal; covers detailed instructions for removing various stains.

American Leather Chemists Assn. Methods of Sampling and Analysis. Commercial Soap and Soap Products, 1942. Methods of the American Oil Chemists Society for sampling and analysis of commercial soaps and soap products have been adopted as official methods of the A.L.C.A.

American Leather Chemists Assn. Methods of Sampling and Analysis. Sponging Compounds, 1942. Gives requirements for consistency, moisture, ash, total grease, unsaponifiable matter, nitrogen, total alkali, pH of 10 percent emulsion, and stability of 10 percent emulsion.

American Oil Chemists' Society. Soap Stock and Acidulated Soap Stock, 1942. Covers preservation of samples; dry-extraction method of total fatty acids of all soap stock and acidulated soap stock, except from copra or palm kernel oils; wet extraction of total fatty acids of all soap stock and acidulated soap stock, except from copra and palm kernel oil; total fatty acids of soap stock or acidulated soap stock from copra, palm kernel, and other oils of similar characteristics; and neutral fat in oil soap.

American Oil Chemists' Society. Standard Methods for the Sampling and Analysis of Commercial Fats and Oils, 1943. Applies to fats and fatty oils used in the soap, candle, and tanning industries; to edible fats and oils; to fats and fatty oils intended for lubricating and burning purposes; and to the raw oils used in the varnish and paint industry; but not intended for waxes. Covers sampling; analysis for moisture and volatile matter, insoluble impurities, soluble mineral matter, fatty acids combined as mineral soap, free fatty acids, titer, unsaponifiable matter, iodine number, saponification number, melting point, softening point, slipping point, flow test, cloud test, bleach test, Halphen test (for cottonseed oil), modified Vallavecchia test, Reichert-Meissl and Polenske numbers, Kirschner value, index of refraction, specific gravity, acetyl and hydroxyl value, smoke, flash and fire points, F.A.C. standard colors, modified Wiley melting point method, thiocyanogen method, and Twitchell method.

American Oil Chemists' Society. Standard Methods for the Sampling and Analysis of Soap and Soap Products, 1943. Covers sampling, preparation of samples, and methods of analysis for moisture, total matter insoluble in alcohol, combined alkali, chloride, unsaponified and unsaponifiable matter, rosin, titer test, acid number of fatty acids, borax determination; determination of silica present as alkaline silicates; determination of carbon dioxide, determination of phosphates, determination of sulphates, determination of glycerol, sugar, and starch; volatile hydrocarbons, screen tests, and determination of combined sodium and potassium oxides in soaps.

American Society for Testing Materials, D 459-44T; 1944. Tentative Definitions of Terms Relating to Soaps and Other Detergents. Defines soap, alkali detergent, anhydrous soap, blended soap, builder, built soap, cleaning, scouring, soap powder, soil, straight soap, washing, and various other terms.

American Society for Testing Materials, D 460-44; 1944. Methods of Sampling, and Chemical Analysis of Soaps and Soap Products. Sampling methods of chemical analysis, moisture, matter insoluble in alcohol, free alkali or free acid, matter insoluble in water, total alkalinity of matter insoluble in alcohol, alkaline salts, combined alkali, total anhydrous soap, chlorides, unsaponified plus unsaponifiable matter, rosin, total fatty matter, titer test, acid number, iodine number, borax, silica, carbonates, phosphates, sulfates, glycerol, sugars, starch, volatile hydrocarbons. These methods are identical in substance with the standard methods of the American Oil Chemists Society and with those of the American Chemical Society.

American Society for Testing Materials, D 501-43; 1943. Methods of Sampling and Chemical Analysis of Special Detergents. Covers inorganic alkaline detergents. Gives procedure for sampling and testing caustic soda, soda ash, modified soda (sesquicarbonate type), sodium metasilicate and sodium sesquisilicate, trisodium phosphate, and tetrasodium pyrophosphate.

American Society for Testing Materials, D 502-39; 1939. Method of Test for Particle Size of Soaps and Other Detergents. Includes hand and machine sieving methods, using A.S.T.M. standard sieves; requirements for sampling and outlines of procedures and calculations.

American Society for Testing Materials, D 800-44 T; 1944. Tentative Methods of Chemical Analysis of Industrial Metal Cleaning Compositions. Gives scope, preparation of samples, reagents, procedures, calculations, and reports for total alkalinity, total fatty acids, anhydrous soap, rosin, total silica, phosphates, combined sodium and potassium oxides, chlorides, sulfates, water, total matter insoluble in alcohol, and free alkali.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Soap. Official methods for determination of moisture, potassium, and sodium.

National Cottonseed Products Assn. Rules, 1945. Definitions of Grade and Quality, Article 19. Soap Stock and Acidulated Soap Stock. Rules 137 and 138. Covers soap stock and acidulated soap stock.

National Cottonseed Products Assn. Rules, 1945. Sampling and Methods of Chemical Analysis. Soap Stock and Acidulated Soap Stock. Rules 243 and 276. Covers drawing samples, handling samples, preservation of samples, dry-extraction method (except from copra or palm kernel oils), optional wet-extraction method (except from copra and palm kernel oils), and total fatty acids of soap stock or acidulated soap stock from copra and palm kernel oils.

Underwear Institute. Specification G-3; 1935. Methods of Washing Rayon and Wool Underwear. Gives suggested methods of washing rayon knit underwear, wool knitted underwear, and wool-cotton knitted underwear.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS43-32; 1932. Grading of Sulfonated (Sulfated) Oils, Saponifiable Types. This specification covers the method of grading sulfonated (sulfated) oils, saponifiable types, which split off their organically combined SO_3 upon boiling with mineral acids; and includes definition, nomenclature, and method of analysis.

U. S. Gov., Federal Specification P-S-536a; 1942. Soap and Soap-Products; General Specifications (Methods for Sampling and Testing). Gives methods of sampling and testing corresponding in all technical details with methods of the American Chemical Society or the American Oil Chemists' Society for sampling, preparation of samples, moisture and volatile matter, matter insoluble in alcohol, free alkali or free acid, matter insoluble in water, alkaline salts, combined alkali, total anhydrous soap, chloride, and unsponifiable matter, rosin, qualitative test for rosin, titer test of total fatty matter, acid number of fatty acids, borax, silica present as alkaline silicates, carbon dioxide (carbonates), phosphates, sulfates, glycerol in the absence of sugar, sugar, glycerol in the presence of sugars, starch, and volatile hydrocarbons. Also gives methods of testing for potassium and sodium in soft soap, qualitative test for sugar, iodine number (Wijs) of fatty acids, solubility and sudsing of soft soap and sieve tests.

871.1 TOILET SOAPS

871.11 Castile Soap

American Hospital Assn., 7-19. Olive Oil-Soda (Castile) Soap. Covers one grade only. Based on U. S. Gov., Navy Dept., Specification 51 S 3f and Federal Specification P-S-536 for General Specifications for Sampling and Testing Soap and Soap-Products.

American Society for Testing Materials, D535-41; 1941. Palm Oil Solid Soap (Type A, Pure; Type B, Blended). Includes pure palm oil solid soap, and blended solid soap of not less than 51 percent palm oil, uniform in color and texture and free from rancid or objectionable odor. Chemical composition, basis of purchase, and methods of sampling and analysis. A.S.T.M. Emergency Alternate Provision EA-D535; 1942, affected requirements for palm oil solid soap.

U. S. Gov., Navy Dept. Specification 51S3f; 1939. Soap; Olive Oil-Soda (Castile).

References.—Olive oil, *see* 813.6, 142.5; soap stock, methods of testing soap and soap stock, *see* 871.0.

871.12 Liquid Toilet Soap

American Hospital Assn., 7-28. Liquid Toilet Soap. Covers one grade. Based on U. S. Gov. Federal Specifications P-S-618.

American Society for Testing Materials, D 799-44T; 1944. Tentative Specification for Liquid Toilet Soap. Gives scope, general requirements, chemical composition, basis of purchase, and methods of sampling and analysis.

U. S. Gov., Federal Specification P-S-618a; 1942. Soap; Toilet, Liquid. Covers one type. Gives requirements for composition, odor, color, and consistency; anhydrous soap, matter insoluble in alcohol, free alkali, chloride, sulfates, methods of sampling, inspection, tests, packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 51 S 35; 1943. Soap; Toilet, Paste (for Liquid Soap).

References.—Soap stock, vegetable oils, *see* 871.0, 142; methods of testing soap and soap stock, *see* 871.0.

871.13 Milled Toilet Soap

American Hospital Assn., 7-31. Milled Toilet Soap. Covers one grade. Based on U. S. Gov. Federal Specification P-S-621.

American Society for Testing Materials, D 455-39; 1939. Milled Toilet Soap. Describes a high grade milled cake soap, colored or uncolored, mildly perfumed unless otherwise specified, as free as possible from water, free lathering in cold, soft water. Requirements for chemical composition, maximum water, basis of weight, and tests using A.S.T.M. Method D 460. A.S.T.M. Emergency Alternate Provision, EA-D 455; 1942, affected section 3, Chemical Composition.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C424; 1939. Washing, Cleaning, and Polishing Materials. This publication discusses briefly the use of water in laundering, pointing out the effects of impurities in water and means of their elimination. A brief description of the general composition of soap, soap-manufacturing processes, and the common varieties of soap products is followed by short discussions of alkaline cleansers and miscellaneous detergents and detergent or laundry aids, such as alkyl sulfates and sulfonates, sulfonated oils, special phosphates, bleaches, sours, bluings, and starch. Brief discussions are also included on dry-cleaning operations, solvents, dry-cleaning soaps, stain removal, finishing, reclamation of solvent, elimination of static electricity in dry-cleaning plants, and carpet and upholstery cleaners. Sections are devoted to furniture and automobile polishes, metal polish, floor wax and polish, glass polish and cleaner, stove polish, shoe polish, polishing cloths, dust cloths, sweeping compounds, wallpaper cleaner, and floor oils. A list of the government specifications for the products covered, numerous literature references, and suggested formulas for some items are also given.

U. S. Gov., Federal Specification P-S-621a; 1942. Soap; Toilet, Milled. Covers one type. Includes requirements for moisture and volatile matter, sum of free alkali (total matter insoluble in alcohol and sodium chloride), free alkali (calculated as sodium hydroxide), matter insoluble in water, unsaponified saponifiable matter, anhydrous soap; sugar and foreign matter, rosin, glycerol; and computation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Soap stock, vegetable oils, *see* 871.0, 142; methods of testing soap and soap stock, *see* 871.0.

871.14 Shaving Soap

U. S. Gov., Federal Specification FFF-C-641; 1938. Cream and Soap; Shaving. Covers two types—(I) soap (cakes, stick, and powder) and (II) cream (lather and brushless). Gives requirements for volatile matter, matter insoluble in ethyl alcohol, free alkali, free fatty acids, matter insoluble in hot distilled water, anhydrous soap, glycerol content, and computation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

871.15 White Floating Soap

American Hospital Assn., 7-25. Floating White Toilet Soap. Covers one type. Based on U. S. Gov. Federal Specification P-S. 616a.

American Society for Testing Materials, D 499-39; 1939. White Floating Toilet Soap. Requires light color cake soap prepared to float on water, gives chemical composition, adjustment for net weight, and tests using A.S.T.M. Method D 460. A.S.T.M. Emergency Alternate Provision, EA-D 499; 1942, affected Title and Test (omitting the word "white") and section 3, Chemical Composition.

U. S. Gov., Federal Specification P-S-616a; 1941. Soap; Toilet, Floating, White. Covers one type. Includes requirements for moisture and volatile matter, sum of free alkali (total matter insoluble in alcohol and sodium chloride), free alkali (calculated as sodium chloride), free alkali (calculated as sodium hydroxide), matter insoluble in water, anhydrous soap, sugar and foreign matter, rosin, glycerol, and computation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Soft soap, *see* 871.3; soap stock, vegetable oils, *see* 871.0, 142; methods of testing soap and soap stock, *see* 871.0.

871.19 Miscellaneous Toilet Soaps

U. S. Gov., Federal Specification P-D-221; 1934. Detergent; Hand, Paste and Powder (for) Mechanics' Use. Shall be of one type only. Gives requirements for odor, volatile matter, alkaline salts, free alkali, free acid, anhydrous soap, insoluble siliceous material, rosin or sugar, computation and glycerol; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification P-S-576; 1930. Soap; Grit, Hand. Covers one grade of cake soap. Gives detail requirements for volatile matter, alkali as alkaline salts, free alkali, insoluble siliceous material, sugar, foreign, matter, anhydrous soda soap; glycerol content; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification P-S-628; 1942. Amendment 1; 1943. Soap-Borax Compound; Toilet, (for) Dispensers. Covers one type. Gives requirements for composition, condition, application, odor, color, anhydrous soda soap, borax, hydrogen (ion) content, matter insoluble in water, rosin, sugar, foreign matter, fineness, computation; methods of sampling, inspection, tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51S37; 1944. Soap; Powdered, Hand, With Vegetable Abrasive.

U. S. Gov., Treasury Dept., Procurement Div., No. 626; 1943. Cleanser; Hand, Duplicating Ink Remover (Hectograph-Type Inks). Covers one type and one grade intended for use in removing hectograph-type duplicating ink stains from the hands. Cleanser shall be in the form of a smooth paste without separation of liquid. Gives requirements for odor, free acid, free alkali, alkaline salts, sieve test, grit test, heat stability test, and practical performance test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Soap stock, vegetable oils, *see* 871.0, 142; methods of testing soap stock and soap, *see* 871.0.

871.2 LAUNDRY AND KITCHEN SOAP, CHIPS, AND POWDER

871.21 Ordinary Laundry and Kitchen Soap

American Hospital Assn., 7-13. Ordinary Laundry Soap. Covers one grade. Based on U. S. Gov. Federal Specification P-S-591.

American Society for Testing Materials, D 497-39; 1939. Ordinary Bar Soap. For use with moderately hard water for general cleaning and laundry purposes. Requirements for general composition, odor, moisture and volatile matter, alkali, acid, matter insoluble in water, rosin, sodium chloride, and anhydrous matter; basis of weight; and tests in accordance with A.S.T.M. Method D 460.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C424; 1939. Washing, Cleaning, and Polishing Materials. This publication discusses briefly the use of water in laundering, pointing out the effects of impurities in water and means of their elimination. A brief description of the general composition of soap, soap-manufacturing processes, and the common varieties of soap products is followed by short discussions of alkaline cleansers and miscellaneous detergents and detergent or laundry aids, such as alkyl sulfates and sulfonates, sulfonated oils, special phosphates, bleaches, sours, bluings, and starch. Brief discussions are also included on dry-cleaning operations, solvents, dry-cleaning soaps, stain removal, finishing, reclamation of solvent, elimination of static electricity in dry-cleaning plants, and carpet and upholstery cleaners. Sections are devoted to furniture and automobile polishes, metal polish, floor wax and polish, glass polish, stove polish, shoe polish, polishing cloths, dust cloths, sweeping compounds, wallpaper cleaner, and floor oils. A list of the government specifications for the products covered, numerous literature references, and suggested formulas for some items are given.

U. S. Gov., Federal Specification P-S-591a; 1942. Soap; Laundry, Ordinary, Bar. Covers one type suitable for moderately hard water. Gives requirements for composition, odor, moisture and volatile matter, sum of free alkali or free acid (total matter insoluble in alcohol and sodium chloride), free alkali, free acid, matter insoluble in water, chloride, rosin, anhydrous soap, and glycerol content; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Soda ash, *see* 834.4, 834.7; caustic soda, caustic potash, *see* 834.8, 832.3; soap stock, methods of testing soap and soap stock, *see* 871.0.

871.22 Soap Chips

American Hospital Assn., 7-10. Chip Soap. Covers one grade. Based on U. S. Gov. Federal Specification P-S-566.

American Society for Testing Materials, D 496-39; 1939. Chip Soap. For washing, cleaning, and scouring purposes with soft water, when the presence of alkaline salts is not desirable. Requires soap to be made from soda and fats, without rosin, as free as possible from water and all substances other than true soap, light uniform color, and free from disagreeable odor; gives chemical composition, basis of weight, and tests using A.S.T.M. Method D 460. A.S.T.M. Emergency Alternate Provision EA-D496a; 1943, affected section 3, Chemical Composition.

American Society for Testing Materials, D536-42; 1942. Palm Oil Chip Soap (Type A, Pure; Type B, Blended). General and chemical requirements, basis of purchase, and methods of sampling and analysis. A.S.T.M. Emergency Alternate Provision EA-D536; 1943, affected requirements for palm oil chip soap.

American Society for Testing Materials, D 690-44; 1944. Compound Chip Soap (With Rosin). Cover soap suitable for washing, cleaning, and scouring purposes.

U. S. Gov., Federal Specification P-S-566a; 1942. Soap; Chip. Covers one type for laundering and other washing, cleaning, and scouring processes with soft water, where the presence of alkaline salts is not desirable. Includes requirements for moisture and volatile matter, sum of free alkali (total matter insoluble in alcohol and sodium chloride), free alkali (calculated as sodium hydroxide), matter insoluble in water, anhydrous soap, titer of the mixed fatty acids prepared from the soap, rosin, glycerol content, and computation; methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification P-S-581; 1942. Soap; Laundry, Chip, Rosin-Type. Suitable for moderately hard water. Gives requirements for odor; bid samples, moisture and volatile matter, sum of free alkali or free acid (insoluble in alcohol and sodium chloride), free alkali, free acid, matter insoluble in water, chloride, rosin, anhydrous soap, and glycerol content; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

References.—Soda ash, *see* 834.4, 834.7; caustic soda, caustic potash, *see* 834.8, 832.3; soap stock, methods of testing soap and soap stock, *see* 871.0.

871.23 Soap Powders

American Hospital Assn., 7-1. Dishwashing Compound. Covers one type, one grade, and one class. Based on U. S. Army Specification 4-1092.

American Hospital Assn., 7-16. Powdered Laundry Soap. Covers one type. Based on U. S. Gov. Federal Specification P-S-596.

American Hospital Assn., 7-22. Soap Powder. Covers one grade. Based on U. S. Gov. Federal Specification P-S-606.

American Hospital Assn., 7-34. Powdered Toilet Soap for Dispensers. Covers one type. Based on U. S. Gov. Federal Specifications P-S-626 for Powdered Toilet Soap for Dispensers, RR-S-366 for Standard Testing Sieves, and FF-D-396b for Soap Dispensers.

American Hospital Assn., 7-43. Technical Trisodium Phosphate (Phosphate Cleaner). Covers one grade and either granular, flake, or crystalline. Based on U. S. Gov. Federal Specification O-T-671a.

American Society for Testing Materials, D 498-39; 1939. Powdered Soap (Nonalkaline Soap Powder). Suitable for washing, cleaning, and scouring purposes with soft water, when presence of alkaline salts is not desirable. Requires soap in powder form to be made from soda and fats, without rosin, as free as possible from water and substances other than true soap, light uniform color, and free from objectionable odor; gives chemical composition, determination of net weight, and tests using A.S.T.M. Method D 460 for soap and D 502 for sieve analysis. A.S.T.M. Emergency Alternate Provision EA-D498a; 1943, affected section 3, Chemical Analysis.

American Society for Testing Materials, D 534-42; 1942. Alkaline Soap Powder. Covers a uniform mixture of soap and sodium carbonate, with or without other alkaline salts, in powdered form, readily soluble in tepid water, and containing no free caustic or inert fillers. Chemical composition, basis of purchase, and methods of sampling and analysis.

American Society for Testing Materials, D 691-44; 1944. Compound Powdered Soap (Granulated, With Rosin). Covers soap suitable for washing, cleaning, and scouring purposes.

U. S. Gov., Federal Specification O-T-671a; 1940. Trisodium-Phosphate; Technical (Phosphate Cleaner). Covers one grade. Gives detail requirements; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-S-583; 1942. Soap; Laundry, Granulated, Rosin-Type. Suitable for moderately hard water. Gives requirements for odor, bid sample, moisture and volatile matter, sum of free alkali or free acid (insoluble in alcohol and sodium chloride), free alkali, free acid, matter insoluble in water, chloride, rosin, anhydrous soap, glycerol content, and residue; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-S-596a; 1942. Soap; Laundry, Powdered. Covers one type, suitable for laundering and other washing, cleaning, and scouring processes with soft water, when the presence of alkaline salts is not desirable. Includes requirements for moisture and volatile matter, sum of free alkali (total matter insoluble in alcohol and sodium chloride), free alkali (calculated as sodium hydroxide), matter insoluble in water, anhydrous soap, titer of the mixed fatty acids prepared from the soap, rosin, glycerol content, and computation; methods of sampling, inspection, and tests.

U. S. Gov., Federal Specification P-S-606a; 1942. Amendment 2; 1944. Soap Powder. Covers one type of a uniform mixture of soap and sodium carbonate, and/or other alkaline salts, in powdered form. Gives requirements for anhydrous soap, alkaline salts, and glycerol content; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-S-626a; 1942. for Soap; Toilet, Powdered, (for) Dispensers. Covers one type. Gives requirements for composition, odor, color, volatile matter, sum of free alkali (total matter insoluble in alcohol and sodium chloride), free alkali, matter insoluble in water, anhydrous soda soap, rosin, sugar, foreign matter, glycerol content, fineness, and computation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1092; 1939. Dishwashing Compound.

References.—Soda ash, *see* 834.4, 834.7; caustic soda, caustic potash, *see* 834.8, 832.3; soap stock, methods of testing soap and soap stock, *see* 871.0; metal polishes, *see* 891; scouring powders, *see* 871.27.

871.24 Liquid Laundry Soap

U. S. Gov., Federal Specification P-S-586; 1930. Soap; Laundry, Liquid. Covers one grade. Gives requirements for composition, detail requirements, sampling, testing, total anhydrous soap, matter soluble in alcohol, matter insoluble in water, chloride, volatile solvent, action on fabrics, reagents, packaging, packing, and marking.

References.—Soda ash, *see* 834.4, 834.7; caustic soda, caustic potash, *see* 834.8, 832.3; soap stock, methods of testing soap and soap stock, *see* 871.0; metal polishes, *see* 891.

871.25 Laundry Sours

References.—Acetic acid, oxalic acid, *see* 821.1, 831.6.

871.26 Scouring Soaps

U. S. Gov., Federal Specification P-S-571a; 1942. Amendment 2; 1944. Soap; Grit, Cake. Covers two types—(A) for fine work, such as glass and enamel, and (B) for scouring and scrubbing. Gives requirements for moisture and volatile matter, alkali as alkaline salts, free alkali (calculated as sodium hydroxide), insoluble siliceous material, sugar and foreign matter, anhydrous soda soaps, glycerol content, and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51S20b; 1944. Soap; Grit, Cake.

References.—Soda ash, *see* 834.4, 834.7; caustic soda, caustic potash, *see* 834.8, 832.3; soap stock, methods of testing soap and soap stock, *see* 871.0; metal polishes, *see* 891; scouring powders, *see* 871.27.

871.27 Scouring Powders

American Hospital Assn., 7-4. Scouring Powder for Floors. Covers three types—(A) for fine marble floors, (B) for tile or ceramic and terrazzo floors, and (C) soap scouring compound. Based on U. S. Gov. Federal Specification P-P-591.

American Hospital Assn., 7-7. Scouring Powder for Highly Polished Glass. Covers one grade. Based on U. S. Gov. Federal Specifications P-P-596 for Scouring Powder, and RR-S-366 for Standard Testing Sieves.

U. S. Gov., Federal Specification P-P-591; 1930. Powder; Scouring (for) Floors. Covers three types—(A) for fine marble floors, (B) for tile or ceramic and terrazzo floors, and (C) soap scouring compound.

Gives requirements for volatile matter, sodium carbonate, anhydrous soap, free alkali, insoluble siliceous matter, carbonated alkali, glycerol content, and physical properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification P-P-596a; 1942. Powder; Scouring (for) Highly Polished Glass. Covers one type. Gives requirements; volatile matter, alkaline salts, free alkali, insoluble siliceous matter, rosin, sugar, foreign matter, anhydrous soap, and glycerol content; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

References.—Soda ash, *see* 834.4, 834.7; caustic soda, caustic potash, *see* 834.8, 832.3; soap stock, methods of testing soap and soap stock, *see* 871.0; other laundry soap powders, *see* 871.23; metal polishes, *see* 891.

871.29 Miscellaneous Specifications for Laundry and Kitchen Soaps

U. S. Gov., Federal Specification P-S-600; 1943. Amendment 2; 1944. Soap; Low-Titer (for Low-Temperature Washing). Shall be of the following types and classes: Type I, bar form; type II, other forms; class A, granular; class B, powdered; class C, flake. Gives requirements for color, odor, bid sample, and details of chemical and physical requirements; methods of sampling, inspection, tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-S-603; 1941. Soap; Potash-Linseed Oil; Liquid and Paste, (for) Floor and General Cleaning. Shall be a paste soap. For use on all kinds of floor finishes where cleaner is specified, except on rubber flooring. Gives requirements for consistency, color, and odor; bid samples, keeping qualities, moisture, total matter insoluble in alcohol, free alkali, free acid, alkaline salts, matter insoluble in distilled water, chloride, unsaponified and unsaponifiable matter, anhydrous soap, total sodium compounds, glycerol, iodine number, acid number of mixed fatty acids derived from the soap, rosin, and sugar; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-S-613; 1937. Amendment 1; 1938. Soap; Soft, Potash-Linseed Oil. Covers one type. Gives requirements for consistency, color, and odor, bid samples, keeping qualities, moisture, total matter insoluble in alcohol, free alkali, free acid, alkaline salts, matter insoluble in distilled water, chloride, unsaponified and unsaponifiable matter, anhydrous soap, total sodium compounds, glycerol, iodine number, acid number of mixed fatty acids derived from the soap, rosin, and sugar; methods of sampling, inspection, and tests—according to U. S. Federal Specification P-S-536; 1937, for Methods of Sampling and Testing Soap and Soap Products.

U. S. Gov., Navy Dept. Specification 51C49; 1944. Compound; Dishwashing.

References.—Caustic soda, lye, *see* 834.8.

871.3 SOAPS FOR MEDICINAL AND SURGICAL USE

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Hard Soap (Soap). Description, solubility, reaction, loss on drying, limit of saturated acids, heavy metals (sodium chloride, carbonate, silica, or other alcohol-insoluble substances), silica or other water-insoluble substances, alkali hydroxides or free fatty acids, alkali carbonates, characteristics of the combined fatty acids, and storage. U.S.P. products of hard soap—Linimentum Camphorae et Saponis, Linimentum Chloroformi.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Liniment of Soft Soap (Tincture of Green Soap). Preparation and alcohol content.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Medicinal Soft Soap (Soft Soap, Green Soap). Description, reaction, water, alcohol-insoluble substances, free alkali hydroxides, alkali carbonates, unsaponified matter, characteristics of the liberated fatty acids, and storage. U.S.P. product of medicinal soft soap—Linimentum Saponis Mollis.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1027B; 1944. Soap; Soft (Hospital Grade).

References.—Soap stock, vegetable oils, *see* 871.0, 142; methods of testing soap and soap stock, *see* 871.0.

871.4 AUTOMOBILE SOAP

U. S. Gov., Federal Specification P-S-598; 1941. Amendment 3; 1944. Soap; Liquid and Paste, (for) Automobile, Floor, and General Cleaning. Covers two types—(I) liquid and (II) paste. Gives requirements for consistency, color, odor, moisture, solubility and sudsing, bid samples, keeping qualities, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Soap stock, vegetable oils, *see* 871.0, 142; methods of testing soap and soap stock, *see* 871.0; metal polishes, *see* 891.

871.5 SALT-WATER SOAP

American Society for Testing Materials, D 593-42; 1942. Salt-Water Soap. Soap for use in salt water, made from cocoanut oil, palm kernel oil, or mixture thereof and soda, entirely soluble in salt and fresh water, white in color, and free from objectionable odor. Requirements for chemical composition, basis of settlement by weight of nonvolatile matter, and for tests using A.S.T.M. Method D 460. Emergency Alternate Provision EA-D593; 1942. (No substitute for salt-water soap is available at present.)

U. S. Gov., Federal Specification P-S-611a; 1942. Amendment 3; 1944. Soap; Salt-Water. Covers one type, entirely soluble in both sea water and fresh water. Gives requirements for composition, moisture and volatile matter, total matter insoluble in alcohol, free alkali, chloride, anhydrous soap, matter insoluble in water, acid number of the mixed fatty acids prepared from the soap, sugar and foreign matter, rosin, and glycerol; methods of sampling,

inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51S46; 1945. Soap; Salt-Water, Bar-Form, Containing Synthetic Detergent.

References.—Soap stock, vegetable oils, *see* 871.0, 142; methods of testing soap and soap stock, *see* 871.0; soda ash, caustic soda, caustic potash, *see* 834.4, 834.8, 832.3.

871.6 HARNESS SOAP

U. S. Gov., Federal Specification P-S-609; 1943. Amendment 1; 1944. Soap; Saddle. Covers only one grade and shall be a homogeneous paste consisting of soap, waxes, and oils in aqueous emulsion. Gives general requirements, consistency, matter volatile at 105° C., free alkali as sodium hydroxide, free acid as oleic acid, alkaline salts as sodium carbonate, anhydrous soap, unsaponified matter, unsaponifiable matter, and matter insoluble in water; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 4-9C; 1938. Soap; Saddle.

References.—Leather dressings and cleaners, *see* 891.

871.7 DRY-CLEANING SOAP

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Dry Cleaning Department, 1940. Includes petroleum solvents and soaps used in them for dry cleaning purposes and methods for clarifying solvents.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes formulae for prespotting soap, wet spotters, and pyridine spotting solutions, synthetic wetting agents, and other lubricating agents—methods of preparation and recommended uses.

References.—Dry-cleaning solvent, *see* 503.2; bleaches, *see* 891.

871.8 GREASE-CLEANING SOAP

U. S. Gov., Federal Specification P-C-576; 1942. Compound; Grease-Cleaning, Solvent-Emulsion Type. Intended for use in the cleaning of automobile engine blocks and for general cleaning of oily surfaces. Covers one grade and two types—(I) nonphenolic and (II) phenolic. Gives requirements for flash point, acid value, free alkali, pour point, volatile matter, phenols, and physical and performance tests; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

871.9 MISCELLANEOUS SOAP AND CLEANING COMPOUNDS

American Hospital Assn., 34-88. Sweeping Compound. Based on U. S. Gov. Federal Specifications P-C-591a for Sweeping Compound and RR-S-366 for Standard Testing Sieves.

American Society for Testing Materials, D533-44; 1944. Built Soap; Powdered. Covers three types of built soap in form of powder suitable for use at high, medium, or low temperatures, where presence of alkaline salts is desirable. General requirements, chemical composition, basis of purchase, and methods of sampling and analysis.

American Society for Testing Materials, D 537-41; 1941. Sodium Metasilicate. For various washing, cleaning, and scouring processes, with or without soap, where a moderately strong alkaline material is desired. Gives chemical composition, basis of purchase, and methods of sampling and analysis.

American Society for Testing Materials, D 538-44; 1944. Trisodium Phosphate. Covers material suitable for various washing, cleaning, and scouring processes, with or without soap, where a moderately strong alkaline material is desired. Covers a white uniform product in either flake, granular, or crystalline form. Gives requirements for chemical composition, bases of purchase, and methods of sampling and testing.

American Society for Testing Materials, D592-42; 1942. Olive Oil Solid Soap (Type A, Pure; Type B, Blended). Includes pure olive oil solid soap, and blended solid soap of not less than 51 percent olive oil or olive oil foots. Chemical composition, basis of purchase, and methods of sampling and analysis. A.S.T.M. Emergency Alternate Provision EA-D592; 1942, affected title and text by omitting all references to "pure" and "olive oil," and changing the requirements for titer of the mixed fatty acids for type A soap.

American Society for Testing Materials, D 594-41; 1941. Sodium Sesquisilicate. A strongly alkaline material for washing, cleaning, and scouring processes, with or without soap. Requirements for light colored, uniform, granular product. Chemical composition, basis of purchase, and methods of sampling and analysis.

American Society for Testing Materials, D 595-44 T; 1944. Tentative Specifications for Tetrasodium Pyrophosphate (Anhydrous). A mildly alkaline material with water softening properties for washing, cleaning, and scouring processes, with soap or other detergents. Requirements for a white uniform product in granular or powdered form and chemical composition.

American Society for Testing Materials, D630-42; 1942. Olive Oil Chip Soap (Type A, Pure; Type B, Blended). Olive oil soap in chip form suitable for textile and other purposes. General requirements, chemical composition, basis of purchase, and methods of sampling and analysis. A.S.T.M. Emergency Alternate Provision EA-D630; 1942, affected title and text by omitting all reference to "pure" and "olive oil" and changing the requirements for titer of the mixed fatty acids for type A soap (table I).

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Soap; Industrial. Covers definition, derivation, types and classes, composition, grades and uses, containers, and substitutes.

U. S. Gov., Army Air Forces. Specification 14128-A; 1945. Compound; Steam Cleaning.

U. S. Gov., Army Air Forces. Specification 14131-A-1; 1945. Compound; Cleaning, for Aluminum Parts.

U. S. Gov., Army Air Forces. Specification 20015-C; 1943. Compound; Aircraft Cleaning.

U. S. Gov., Federal Specification P-C-565; 1943. Compound; Cleaning, Soap—Abrasive Type (for Painted Surfaces). Shall be furnished in one type and one grade, and shall be suitable for use in the cleaning of painted surfaces. Covers general requirements, detail requirements, composition, methods of sampling, inspection, tests, packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-C-591a; 1941. Amendment 3; 1944. Compound; Sweeping. Covers one grade in two types—(I) sawdust-sand-mineral oil and (II) sawdust-sand-water-wax emulsion. Gives requirements for odor, test for flammable vapors, volatile matter, refined mineral oil, and sand; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-D-236; 1941. Detergents; Special, (for Aluminumware, Dishwashing Machines, and Manual Cleaning). Covers two types—(I) for use in mechanical dishwashing machines and (II) for manual cleaning; in two classes—(A) nonabrasive and (B) abrasive. Gives detail requirements for turbidity, foaming, corrosion, water softening capacity, hydrogen ion content and buffer index, cleaning ability, relative cost, abrasion, corrosion, glycerol content, and rinsibility; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51C20c; 1944. Compound; Cleaning, for Painted Surfaces.

872. TOILET PREPARATIONS

872.0 GENERAL ITEMS

872.1 TALCUM POWDER

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Purified Talc. Description, identification, loss on ignition, acid-soluble substances, reaction and soluble substances, water-soluble iron, and storage.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 22-255B; 1942. Powder; Talcum and Toilet, Borated, Perfumed.

872.2 TOOTH PASTE AND TOOTH POWDER

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. N. F. Dentifrice. Gives chemical composition, preparation, and storage.

U. S. Gov., Federal Specification FFF-D-191a; 1940. Dentifrice; Tooth Paste. Gives detail requirements for composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

872.3 FOOT POWDER

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1030; 1939. Foot Powder.

880-889 DISINFECTANTS AND WATER TREATMENTS

881. DISINFECTANTS AND INSECTICIDES

881.0 GENERAL ITEMS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Official methods for sampling; preparation of reagents; determination of total arsenic, water-soluble arsenic, lead oxide, copper, zinc oxide, fluorine; covers general methods.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R41-42; 1942. Package Sizes for Agricultural Insecticides and Fungicides. This recommendation establishes standard retail package sizes for agricultural insecticides and fungicides. Packages or containers so used must comply with the specifications prescribed in the Interstate Commerce Commission's regulations for the transportation of explosives and other dangerous articles. Initiated by the Agricultural Insecticide and Fungicide Assn.

881.1 INSECT STOMACH POISONS

881.11 Arsenate and Arsenite of Lead

Assn. of Offical Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Lead Arsenate. Official methods for determination of moisture, total arsenic, total arsenious oxide, arsenic oxide, water-soluble arsenic, total lead oxide.

U. S. Gov., Treasury Dept., Procurement Div., No. 686; 1944. Lead Arsenate; Acid Type, Powder. Covers one type and one grade. Gives requirements for material, application, arsenic content, lead content, water soluble arsenic content, and total water soluble matter; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Package sizes, *see* 881.0.

881.12 Arsenate and Arsenite of Lime

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Calcium Arsenate. Official methods for determination of moisture, total arsenic, total arsenious oxide, water-soluble arsenic, total calcium oxide.

References.—Labeling requirements, package sizes, *see* 881.0.

881.13 Arsenate and Arsenite of Soda

881.14 Hellebore (Plant Root)

881.15 Paris Green, Schlee's Green, London Purple

Assn. of Official Argicultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Paris Green. Official methods for determination of moisture, total arsenic, total arsenious oxide, total arsenic oxide, water-soluble arsenious oxide, water-soluble arsenic oxide.

U. S. Gov., Navy Dept. Specification 52G7; 1924. Paris Green.

References.—Package sizes, *see* 881.0.

881.16 Poisoned Grain

881.17 Powders For Dusting

American Hospital Assn., 34-94. Roach and Water Bug Exterminators. Covers powder and tablets.

U. S. Gov., Federal Specification O-S-601; 1930. Amendment 1; 1938. Sodium-Fluoride (Insecticide). Covers one grade. Gives detail requirements; method of sampling, inspection, and test; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-O-S-601; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) deleted requirements for metal cans.

References.—Methods of testing, labeling requirements, *see* 881.0.

881.18 White Arsenic (Arsenic Trioxide)

American Standards Assn., Z 37.9-1943. Developed by the U. S. Public Health Service. Allowable Concentration of Metallic Arsenic and Arsenic Trioxide (American War Standard). To prescribe the maximum permissible concentration of metallic arsenic and of arsenic trioxide in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers. Gives properties of arsenic, permissible concentration, sampling procedure, and analytical methods.

References.—Methods of testing, labeling requirements, *see* 881.0; arsenic trioxide for medicinal purposes, *see* 814.2; arsenic troixide as chemical reagent, *see* 839.9.

881.19 Miscellaneous Insect Stomach Poisons

American Hospital Assn., 34-94. Roach and Water Bug Exterminators. Covers powder and tablets.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Magnesium Arsenate. Official methods for determination of moisture, total arsenic, total arsenious oxide, water-soluble arsenic.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Zinc Arsenite. Official methods for determination of moisture, total arsenic, total arsenious oxide, water-soluble arsenic, total zinc oxide.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Derris (Rotenone Roots, including Timbo, Cube, and Barbasco). Covers definition, constants, solubility, characteristics, uses, forms and grades, containers, hazards, and substitutes.

References.—Labeling requirements, *see* 881.0.

881.2 CONTACT INSECTICIDES

American Hospital Assn., 16-13. Household Insecticide (Liquid Spray Type). Covers methods of test and certification of quality. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Commercial Standard CS72-38.

U. S. Gov., Dept of Commerce, National Bureau of Standards. Commercial Standard CS72-38; 1938. Household Insecticide (Liquid Spray Type). This standard covers the methods of test, biological, physical, and chemical properties, and certification of quality of liquid spray type household insecticide. Sponsored by the National Assn. of Insecticide and Disinfectant Manufacturers.

881.21 Sulphur Insecticides

Agricultural Insecticide and Fungicide Assn. Lime Sulphur Solution, 1928. Requirements on density of solution and percentage of calcium polysulphide.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Lime-Sulphur Solutions. Official methods for determination of total sulphur, thiosulphate sulphur, sulphide sulphur, sulphate sulphur, total lime; tentative method for determining monosulphide equivalent.

881.22 Soap and Oil Sprays

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Mineral Oils. Method for determination of unsulphonated residue.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Mineral Oil and Soap Emulsions. Methods for determination of water, total oil, soap, unsulphonated residue, and ash.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Soap. Official methods for determination of moisture, potassium, and sodium.

U. S. Gov., Federal Specification O-I-541a; 1944. Insecticide; Liquid, Fly Spray. Covers one type and one grade. Gives requirements for material, odor, distillation range, flash point, residual odor, staining properties, corrosion test, and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification O-I-546a; 1944. Insecticide; Liquid, for Roaches and Carpet Beetles. Covers one type and one grade. Gives requirements for material; distillation range, flash point, residual odor, staining properties, corrosion test, and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

881.23 Bordeaux Mixture

Agricultural Insecticide and Fungicide Assn. Bulletin 5; 1926. Bordeaux Mixture. Allowable metallic copper content and tolerance.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Bordeaux Mixture. Official methods for determination of moisture, carbon dioxide, and copper.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Bordeaux Mixture With Lead Arsenate. Bordeaux Mixture With Calcium Arsenate. Official methods for determination of moisture, carbon dioxide, total arsenic, water-soluble arsenic, copper, lead oxide.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Bordeaux Mixture With Paris Green. Official methods for determination of moisture, carbon dioxide, total arsenic, total arsenious oxide, water-soluble arsenious oxide, and copper.

References.—Labeling requirements, package sizes, *see* 881.0.

881.24 Nicotine Insecticides

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Tobacco and Tobacco Extract. Official methods for determination of nicotine.

References.—Labeling requirements, *see* 881.0; tobacco, *see* 261.

881.25 Mercuric Chloride

References.—Mercuric chloride, *see* 839.36.

881.26 Insect Powder (Pyrethrum)

U. S. Gov., Federal Specification O-P-571a; 1930. Powder; Insect (Pyrethrum-Powder). Gives detail requirements; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-O-P-571; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) deleted requirements for metal cans.

U. S. Gov., Navy Dept. Specification 51P15; 1937. Pyrethrum Concentrate, for Use in Insecticide.

References.—Sodium fluoride, insect powder, *see* 834.9; labeling requirements, *see* 881.0.

881.27 Flour Paste

881.28 Naphthalene

References.—Naphthalene for medicinal purposes, *see* 801.4.

881.29 Miscellaneous Contact Insecticides

U. S. Gov., Navy Dept. Specification 51-I-4; 1944. Insecticide-Ingredients; Aliphatic Thiocyanates, Straight-Chain.

881.3 FUMIGANTS

881.30 General Items

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Fumigation of Grain Storage. Suggested good practices for fumigation of grain storage and grain processing plants. Covers construction, cleanliness, protection, heat method of insect control, coal method of insect control, hydrocyanic acid gas fumigation, chloropictin gas fumigation, carbon bisulphide gas fumigation, commercial fumigants sold under trade names, fumigation of grain in storage, and conclusion.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Model Fumigation Ordinance. Good practice regulations recommended for adoption by regulatory body. Covers definitions, restrictions, permits, notification, premises to be vacated, notice to occupants, precautions against fire, sealing cracks or openings, materials and operators, danger signs, watchman, special room, vault or tank, and ventilation and clean-up.

881.31 Hydrocyanic Acid Gas

881.32 Carbon Disulphide

American Standards Assn., Z 37.3-1941. U. S. Public Health Service, endorsing sponsor. Allowable Concentration of Carbon Disulfide. To prescribe the permissible concentration of carbon disulfide in the atmosphere of work places for the protection of the health of all workers. Gives properties of carbon disulfide, permissible concentrations, sampling, and analytical methods.

References.—Carbon disulphide as a reagent for chemical analysis, *see* 839.6.

881.33 Sulphuric Acid

References.—Sulphuric acid, *see* 821.7.

881.34 Sodium Cyanide

References.—Sodium cyanide, insecticide, *see* 834.1; labeling requirements, *see* 881.0.

881.35 Sodium Fluoride

References.—Sodium fluoride, insect powder, *see* 834.9; labeling requirements, *see* 881.0.

881.39 Miscellaneous Fumigants

U. S. Gov., Navy Dept. Specification 51F9a; 1943. Fumigant; Ships'.

U. S. Gov., Treasury Dept., Procurement Div., No. 699; 1944. Methyl Bromide, for Fumigation Purposes. Covers one grade and shall be clear, colorless, or pale-straw colored liquid. Gives requirements for methyl bromide content and containers; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

881.4 CAUSTIC WASHES FOR BORERS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Formaldehyde Solutions. Official methods for determination of formaldehyde.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Soda Lye. Official methods for determination of carbonate and hydroxide.

References.—Formaldehyde solution, *see* 881.9; labeling requirements, *see* 881.0.

881.5 DISINFECTANTS FOR BUILDINGS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS69-38; 1938. Pine Oil Disinfectant. This standard covers materials, physical and chemical properties, and certification of quality of pine oil disinfectant. Initiated by the National Assn. of Insecticide and Disinfectant Manufacturers.

U. S. Gov., Treasury Dept., Procurement Div., 651a; 1944. Disinfectant; Hospital Use. Covers one type and one grade of a free flowing liquid. Gives requirements for odor action on bacteria, toxicity, dermatitis, solubility in water, and hydrogen ion concentration; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Fumigants, *see* 881.3; carbolic acid, *see* 802.1.

881.9 MISCELLANEOUS DISINFECTANTS AND INSECTICIDES

American Hospital Assn., 16-16. Liquid Hypochlorite Disinfectant, Deodorant, and Germicide. Based on U. S. Gov., Dept. of Commerce, National Bureau of Standards, Commercial Standard CS68-38.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Copper Carbonate. Official method for determination of copper oxide.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Insecticides and Fungicides. Organic Mercurial Seed Disinfectants. Methods for the determination of mercury.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Para-Dichlorobenzene. Covers definition, constants, derivation, solubility, uses, and packing.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS68-38; 1938. Liquid Hypochlorite Disinfectant, Deodorant, and Germicide. This standard covers the composition, physical and chemical properties, identification, method of packing, and certification of quality of liquid hypochlorites. Initiated by the National Assn. of Insecticide and Disinfectant Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS70-38; 1938. Coal Tar Disinfectant (Emulsifying Type). This standard covers materials, physical and chemical properties, and certification of quality of emulsifying type coal-tar disinfectant. Sponsored by the National Assn. of Insecticide and Disinfectant Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS71-38; 1938. Cresylic Disinfectants. This standard covers materials, physical and chemical properties, and certification of quality of cresylic disinfectants. Sponsored by the National Assn. of Insecticide and Disinfectant Manufacturers.

U. S. Gov., Navy Dept. Specification 14K1b; 1942. Kerosene; Water-White, for Use in Insecticide.

U. S. Gov., Navy Dept. Specification 51C28a; 1945. Compound; Cleaning, for Toilet Bowls.

U. S. Gov., Navy Dept. Specification 51D6; 1944. Disinfectant, Germicide, and Fungicide.

U. S. Gov., Navy Dept. Specification 51E2; 1934. Exterminators; Roach and Water-Bug.

U. S. Gov., Treasury Dept., Procurement Div., 431B; 1941. Fungicide; Liquid, Concentrated (for General Sanitation Purposes in the Maintenance of Field Projects, Sterilization of Industrial Garments, Etc.). Shall effectively and safely serve as sanitation requisite in maintenance of field project toilet facilities; shall not be irritating to skin of persons wearing clothing or using facilities after disinfection, and shall act as a body deodorizer. Shall be clear liquid and show no separation of dissolved constituents between 40° F. to 100° F., and shall not decompose in prolonged storage. Gives requirements for dilution properties, ash content, and performance test; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 640; 1943. Paradichlorbenzene (Dichlorbenzene, Para); Technical Grade. Covers one grade and one type of white crystals free from hard caking in the container. Gives requirements for appearance, crystallizing point, and particle size; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 703; 1944. Disinfectant; General-Use. Covers one type and one grade in a free flowing liquid. Gives requirements for odor, bactericidal action, dermatitis, miscibility with water, oxidizing agents, hydrogen ion concentration, and corrosion effect; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Coal-tar disinfectants, *see* 803.4; labeling requirements, *see* 881.0.

882. WATER TREATMENTS, SEWAGE TREATMENTS

882.0 GENERAL ITEMS

American Public Health Assn. Standard Methods for the Examination of Water and Sewage, 1941. The methods detailed in part I are adapted to the sanitary examination of waters which are not grossly polluted. The methods detailed in part II are adapted to the mineral examination of normally mineralized fresh waters, stationary boiler waters, and railway boiler waters. They are generally not applicable to the study of brines. The methods detailed in parts III and IV are adapted to the examination of polluted waters, sewage, effluents and industrial wastes. The methods detailed in parts V, VI and VII are respectively adapted to the microscopical and bacteriological examination of polluted and/or unpolluted waters. The methods outlined in appendix I are provisional methods only, as yet not being recognized as standard. The methods outlined in appendix II are provisionally proposed for the examination of swimming pools and bathing places.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Standard Methods for the Analysis of Chemicals Used in Water Treatment. Covers analyses of soda ash, hydrated lime, sulphate of iron, and sulphate of alumina.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Standard Methods of Water Analysis and Interpretation of Results. Gives field survey or rapid check tests, rapid field tests, and laboratory methods.

American Society of Civil Engineers. Manuals of Engineering Practice, No. 2; 1928. Definitions of Terms Used in Sewage and Sewage Disposal Practice. Lists alphabetically and defines approximately three hundred terms.

American Society for Testing Materials, D510-41; 1941. Methods of Sampling Plant or Confined Waters for

Industrial Uses. For water in pipe, conduit, or tank, to be conveyed to an industrial operation. General principles for sampling, list of tests to be made and volume of sample for each test, frequency and duration of sampling, composite samples, containers for samples, point of sampling, precedure in taking sample, cooling hot samples, suspended solids, labeling, and transporting of samples.

American Society for Testing Materials, D 511-42; 1942. Method for Determination of the Calcium Ion and Magnesium Ion in Industrial Waters. Covers the gravimetric determination of the calcium and magnesium ions, the first by precipitation as calcium oxalate and ignition to calcium oxide, and the second by precipitation as magnesium ammonium orthophosphate and ignition to magnesium pyrophosphate; including preliminary removal of silica, phosphates, iron, and aluminum, together with removal of manganese when necessary.

American Society for Testing Materials, D 512-42; 1942. Method for Determination of the Chloride Ion in Industrial Waters. Procedure for the volumetric determination of chloride ion by titration of the sample with a solution of silver nitrate in the presence of potassium chromate as an internal indicator. A double titration is specified to eliminate end point error, and directions for clarifying samples of high turbidity or color, are for eliminating interference of sulfite and given.

American Society for Testing Materials, D 513-43; 1943. Method for Determination of Total Carbon Dioxide and Calculation of the Carbonate and Bicarbonate Ions in Industrial Waters. Covers method of decomposing carbonates by an excess of acid and absorption of carbon dioxide in barium hydroxide solution and titration with standard acid, but is not applicable to water containing sulfides, sulfites, or other salts of volatile acids. Describes apparatus, special solutions required, procedure, and calculation.

American Society for Testing Materials, D 514-41; 1941. Method for Determination of the Hydroxide Ion in Industrial Waters. Covers the titration of water to which strontium chloride has been added to remove carbonate and phosphate ions. Minimizes turbidity and permits the direct titration of the hydroxide ion with decreased interference. For the examination of alkaline industrial waters such as boiler waters and boiler feed-waters under conditions where the water is practically free from organic matter, silicates, and aluminates. Application, special solutions required, procedure, and calculation.

American Society for Testing Materials, D 515-43; 1943. Method for Determination of the Total Orthophosphate and Calculation of the Respective Orthophosphate Ions in Industrial Waters. For two successive separations of the phosphate ion, as ammonium phosphomolybdate and as magnesium ammonium phosphate, respectively. The magnesium ammonium phosphate is ignited to magnesium pyrophosphate and weighed. Gives application, reagents, procedure, and calculation.

American Society for Testing Materials, D 516-42; 1942. Method for Determination of the Sulfate Ion in Industrial Waters. Covers procedure for the precipitation and weighing of the sulfate ion as barium sulfate. Where no ion other than sulfate is to be determined on the sample, removal of dissolved silica is usually unnecessary.

American Society for Testing Materials, D 596-41; 1941. Method of Reporting Results of Analysis of Industrial Waters. Recommendations as to nature, extent, and form of results of analysis. Definitions, history of sample, completeness and accuracy of analysis, hydrogen ion concentration, suspended solids, dissolved solids, dissolved gases, and conversion factors.

American Society for Testing Materials, D 807-44 T; 1944. Tentative Method for Embrittlement Testing of Boiler Water. Gives scope, embrittlement cracking, apparatus, principle of method, test specimens, preparation of test specimen, assembly of specimen and detector, installation of detector, procedure, test interval, inspection of the tested specimen, and interpretation of results.

American Water Works Assn. Tentative Standard Specifications for Filtering Material, 5C-T-1943. Provides a general basis for choosing underdrain gravel and filtering material and placing such material in the filter. Gives requirements for underdrain gravel, filtering material, testing and sampling, payment, and appendixes.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Waters, Brine, and Salt. Industrial Water. Determination of solids in solution: chlorine, combined carbonic and bicarbonic acids, nitrates, silica, iron, aluminum, calcium, magnesium, sulfuric acid, alkalinity before and after boiling, total hardness, and permanent hardness.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Waters, Brine, and Salt. Irrigating Water. Determination of solids in solution, chlorine, carbonic and bicarbonic acids, sulphuric acid, calcium, magnesium, and black alkali.

National District Heating Assn. Proposed Tentative Method for Measurement of Relative Corrosion Rates—N.D.H.A. Method, 1945. Provides a simple and rapid means for measuring the relative corrosivity of aqueous solutions and of comparing the corrosion resistivity of different metals when exposed to such environments. Applicable to the making of measurements in municipal water supplies, industrial processes, pilot plant experiments, and laboratory studies, where waters relatively free of suspended materials, at temperatures below about 400° F. and at flow rates below about 5 ft. per second are encountered. Gives requirements for apparatus, fabrication of frame, helical coils, and couplings, assembling a tester, criteria for installing a tester, period of exposure, cleaning of test specimens, calculation of average corrosion rates, conversion factors, table showing conversion factors and other pertinent data for materials commonly used in water lines, interpretation of data, and drawings.

Technical Assn. of the Pulp and Paper Industry. Analysis of Industrial Process Water. Tentative Standard T 620 m-44; 1944. Method of mineral analysis of water for use in boilers and manufacturing purposes in pulp, paper, and paperboard industry. Covers analysis for turbidity, color, solids, hydrogen ion concentration, alkalinity, acidity, dissolved oxygen and B.O.D., oil, and hardness.

U. S. Gov., Federal Specification SS-C-744; 1942. Crushed Stone, Crushed Slag, and Gravel; (for) Sewage-Trickling-Filter-Media. Gives requirements for material, soundness, and grading; and methods of sampling, inspection, and tests.

882.1 ANTIFOAMING BOILER COMPOUND

References.—Boiler compounds, *see* 882.2.

882.2 ANTISCALE BOILER COMPOUND

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Hydrated Lime To Be Used in Water Treatment. Covers two grades—high-calcium and calcium. Gives requirements for chemical and physical properties and tests, packing, inspection, penalization, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Quicklime To Be Used in Water Treatment. Covers two grades—high-calcium and calcium; and four forms—lump, pebble, ground, and pulverized. Gives requirements for chemical properties and tests, packing, inspection, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Soda Ash To Be Used in Water Treatment. Gives requirements for chemical and physical properties and tests, packing and marking, and inspection and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Sulphate of Alumina To Be Used in Water Treatment. Gives requirements for chemical properties, physical properties, and tests; packing and marking; and inspection and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Sulphate of Iron To Be Used in Water Treatment. Covers granular sugar sulphate of iron. Gives requirements for chemical properties and tests, packing and marking, and inspection and rejection.

U. S. Gov., Navy Dept. Specification 13C31; 1944. Compound; Boiler, Navy, 1941.

References.—Methods of water analysis, *see* 882.0; other specifications for lime, for soda ash, *see* 517.2, 834.4; salt for water softening plants, *see* 834.9.

882.3 DRINKING WATER AND TREATMENT OF DRINKING WATER

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Hydrated Lime To Be Used in Water Treatment. Covers two grades—high-calcium and calcium. Gives requirements for chemical and physical properties and tests, packing, inspection, penalization, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Quicklime To Be Used in Water Treatment. Covers two grades—high-calcium and calcium; and four forms—lump, pebble, ground, and pulverized. Gives requirements for chemical properties and tests, packing, inspection, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Salt To Be Used in Regeneration of Zeolite Water Softening Plants. Covers crushed rock salt and evaporated salt. Gives requirements for chemical and physical properties, tests, packing, marking, inspection, penalization, and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1920. Water for Drinking Purposes. Must comply with requirements issued by Public Health Service. It is preferable that drinking water should be secured from municipal supplies. Where municipal water is impossible or impractical to secure it gives methods of procuring and treating water.

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Waters, Brine, and Salt. For potable water, determination of turbidity, color, odor, solids in solution and suspended, nitrogen as ammonia, nitrite, and nitrate; chlorine, oxygen required, dissolved oxygen, tentative methods for lead, copper, and zinc.

U. S. Gov., Army Air Forces. Specification 40874; 1944. Kit; Sea Water Desalting, Type JJ-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-5b-1; 1944. Water; Emergency Drinking (in Sealed Cans).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 22-177; 1929. Ice.

References.—Methods of water analysis, *see* 882.0.

882.4 WATER FOR CHEMICAL AND MEDICINAL PURPOSES

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls of Redistilled Water. Gives description, clearness, residue, and other tests.

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Redistilled Water. Gives clearness, residue, reaction, chloride, sulfate, ammonia, calcium, metals, carbon dioxide, oxidizable substances, and preparation.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Distilled Water. Description, dissolved solids, reaction, chloride, sulfate, ammonia, calcium, carbon dioxide, and heavy metals.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sterilized Distilled Water. Description and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Water (Aqua). Description, reaction, heavy metals, zinc, foreign volatile matters, dissolved solids, and B. coli. U.S.P. products of water—Aqua Destillata, Aqua Destillata Sterilisata, Aqua Pro Injectione.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Water for Injection. Use in preparation, physical and chemical standards, pyrogens, and added substances.

U. S. Gov., Navy Dept. Specification 51W10; 1945. Water; Distilled.

References.—Methods of water analysis, *see* 882.0; chemicals used in water purification, *see* 517.2, 833.2, 834.4, 834.8, 838.3, 839.33, 839.34, 839.8.

882.5 SEWAGE CHLORINATORS

890-899 MISCELLANEOUS CHEMICAL PRODUCTS

891. BLEACHES, POLISHES, DRESSINGS

Abrasive Grain Assn. Standard for Measurement of Capillarity of Electrically Fused Aluminum Oxide Abrasives for Polishing Uses, 1940. For determining bonding properties between grain particles and the glue; general requirements for freedom from foreign matter, testing apparatus, sampling, methods of test, cleaning of tubes, and table of grit numbers.

American Chemical Society. Specifications for Analytical Reagents, 1941. Hydrogen Peroxide. Gives requirements for strength, nonvolatile matter, free acid, chloride, nitrogen, phosphate, sulfate, and tests.

American Hospital Assn., 7-43. Technical Trisodium Phosphate (Phosphate Cleaner). Covers one grade and either granular, flake, or crystalline. Based on U. S. Gov., Federal Specification O-T-671a.

American Hospital Assn., 34-118. Liquid Furniture Polish. Covers one type and grade.

American Hospital Assn., 34-121. Metal Polish. Covers one grade in powder, liquid, and paste types. Based on U. S. Gov. Federal Specification P-P-556a.

American Hospital Assn., 34-124. Liquid Metal Polish. Covers one grade. Based on U. S. Gov., Navy Dept., Specifications 51P5.

American Hospital Assn., 34-127. Silver Polish. Covers one grade in liquid, paste, and powder types. Based on U. S. Gov., Federal Specification P-P-571b.

American Hospital Assn., 34-142. Liquid and Paste Floor Wax. Covers one grade.

American Hospital Assn., 34-145. Water-Emulsion Floor Wax. Covers one grade in regular and concentrated types. Based on U. S. Gov., Federal Specification P-W-151.

Technical Assn. of the Pulp and Paper Industry. Analysis of Bleaching Powder, Bleach Liquor, and Bleach Sludge. Standard T 611 m-44; 1944. For chloride of lime, hypochlorite solution, and loss of chlorine in sludge. Sampling, methods of testing, and determination of quantities.

U. S. Gov., Army Air Forces. Specification 14099 (1); 1942. Cleaner; Liquid (for Glass).

U. S. Gov., Army Air Forces. Specification No. 14125; 1944. Compound; Metal Cleaner (Heavy Duty).

U. S. Gov., Army Air Forces. Specification No. 14132; 1944. Compound; Shearling Refinishing.

U. S. Gov., Army Air Forces. Specification 20014B; 1944. Compound; Polishing, for Acrylate Base Plastic.

U. S. Gov., Army Air Forces. Specification 20024; 1940. Compound; Polishing (for Metal Aircraft Surfaces).

U. S. Gov., Army Air Forces. Specification 31266 (1); 1943. Bleaching Powder; Film Reversal (for Photographic Use).

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 64. Liquid Cleaner With Dispensers.

U. S. Gov., Federal Specification O-B-441a; 1937. Amendment 1; 1942. Bleaching-Material (Chlorinating Agents). Covers five grades—(A) calcium hypochlorite and calcium hypochlorite in tubes, (B) bleaching powder (35 percent available chlorine), (C) bleaching powder (30 percent available chlorine), (D) sodium hypochlorite solution, and (AA) calcium hypochlorite, special granulated, Gives requirements for available chlorine in grade A, tubes, and contents of tube; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification O-T-671a; 1940. Trisodium-Phosphate; Technical (Phosphate Cleaner). Covers one grade. Gives detail requirements; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-P-546; 1942. Polish; Automobile, Liquid. Covers one type and grade. Gives requirements for nonvolatile matter, ash content, free caustic alkali, neutralization number, particle size, and volatile matter; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-P-552; 1942. Polish; Furniture, Liquid. Covers one type and grade. Gives detail requirements for nonvolatile matter, ash content, free caustic acid, volatile matter, and saponification number; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-P-556a; 1939. Amendment 2; 1943. Polish, Metal. Covers one grade and three types—(I) powder, (II) liquid, and (III) paste. Gives requirements for properties, abrasive material, removal of tarnish, protection of polished surface, keeping qualities, volatile matter, and flammability; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-P-567; 1943. Polish; Shoe, Paste. Shall consist of wax mixed with a volatile solvent to form a paste and shall be black, tan, brown, or oxblood. Gives requirements for being free from flammable materials; odor, polish, consistency, wax content, properties of wax, and properties of volatile solvents; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification P-P-571b; 1939. Polish; Silver. Covers one grade, in three types—(I) liquid, (II) paste, and (III) powder. Gives requirements for properties, removal of tarnish, keeping qualities, volatile matter, and flammability; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-P-576; 1933. Polish; Stove. Covers one grade and four types—(I) liquid, (II) paste, (III) powder, and (IV) cake. Gives methods of inspection, sampling, and tests.

U. S. Gov., Federal Specification P-W-134; 1942. Wax; Floor, Solvent-Type, Liquid (With Resins). Covers one type and one grade. Gives requirements for material, total solids, and vehicle; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification P-W-151a; 1942. Wax; Floor, Water-Emulsion. Covers one grade of free-flowing fluid that can be readily applied with an applicator, such as lamb's wool, cotton cloth, or a mop. For use on sealed floors and floorings. Gives requirements for nonvolatile matter, wax content, and softening point; ash content, free caustic alkali, volatile solvents, and dilution properties; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification P-W-158; 1942. Wax; General-Purpose, Solvent-Type, Liquid and Paste (for Floors, Furniture, Etc.) Covers one grade in two types—(I) liquid and (II) paste. Gives requirements for softening point, acid value, saponification value, ash content, volatile organic solvent, and physical and performance tests; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-D-636; 1943. Amendment 1; 1944. Dressing; Leather, Transmission-Belt. Covers two types—(I) liquid or paste and (II) stick. Gives general requirements, physical requirements, and performance requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-D-51; 1944. Dubbing.

U. S. Gov. Marine Corps Specification, 1926. Blanco; White and Khaki.

U. S. Gov., Navy Dept. Specification 51C18b; 1941. Compound; Polishing.

U. S. Gov., Navy Dept. Specification 51P5f; 1944. Polish; Metal, Liquid.

U. S. Gov., Navy Dept. Specification 52D10; 1944. Dressing; Leather, Belt.

U. S. Gov., Treasury Dept., Procurement Div., 428A; 1940. Polish; Shoe, Paste. Shall be of the wax-turpentine type, one grade, black or tan, and shall be free from toxic materials such as nitro-benzene (oil of mirbane), etc., and have no rancid or objectionable odor. Gives requirements for consistency, flashpoint, color, free acid or free alkali, drying properties, and workability and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

892. PRESERVATIVES AND ARTIFICIAL SWEETENERS FOR FOODS

Assn. of Official Agricultural Chemists. Official and Tentative Methods of Analysis, 1940. Preservatives and Artificial Sweeteners. Methods for determination of presence and amount of salicylic acid, of benzoic acid, saccharin, boric acid; for presence of formaldehyde, of soluble and insoluble fluorides, of beta-naphthol, of abrastol, of sucrol or dulcin; of presence and amount of sulphurous or formic acid.

References.—Salicylic acid, benzoic acid, *see* 812.1; formaldehyde, *see* 824; insoluble fluorides, soluble fluorides, saccharin, abrastol, sucrol, dulcin, *see* 839.9.

893. PLASTICS

893.0 GENERAL ITEMS

American Society for Testing Materials, D 256-43T; 1943. Tentative Methods of Test for Impact Resistance of Plastics and Electrical Insulating Materials. Intended to determine the relative susceptibility to fracture by shock of plastic materials and electrical insulating materials as indicated by the energy expended by a standard pendulum type impact machine in breaking a standard specimen in one blow. Gives requirements for apparatus, test specimen, conditioning test specimens, procedure, and report for both cantilever beam (Izod type) and simple beam (Charpy type) tests.

American Society for Testing Materials, D 543-43; 1943. Method of Test for Resistance of Plastics to Chemical Reagents. Applicable to all organic plastic materials, including cast, molded, laminated resinous products, and sheet materials, for resistance to chemical reagents. Gives requirements for apparatus, reagents, test specimens, procedure, and report.

American Society for Testing Materials, D568-43; 1943. Method of Test for Flammability of Plastics 0.050 Inch and Under in Thickness. Covers the procedure for determining the flammability of plastics in the form of thin sheets or films 0.050 in. and under in thickness. Gives requirements for apparatus, test specimens, fusee method, benzol drop method, and report.

American Society for Testing Materials, D569-44T; 1944. Tentative Method of Test for Measuring the Flow Properties of Thermoplastic Molding Materials. Covers the procedure for determining the temperature at which a thermoplastic material attains a specified degree of flow when subjected to a prescribed pressure in a specified extrusion mold for a definite time. Measurements of flow are made at three or more temperatures, and the temperature for the specified flow is obtained by graphic interpolation. Gives requirements for apparatus, test specimens, conditioning, procedure, plotting results, and report.

American Society for Testing Materials, D 570-42; 1942. Method of Test for Water Absorption of Plastics. Covers immersion test for guide to electrical and mechanical properties and as a control test for uniformity of product. Describes apparatus, preparation of specimen, and procedure including reconditioning, calculation, and report.

American Society for Testing Materials, D618-44T; 1944. Tentative Methods of Conditioning and Classifying for Conditioning Plastics and Electrical Insulating Materials for Testing, Cover procedures for establishing standard periods of time, temperatures, and relative humidities to be used in the pretreatment of plastics and electrical insulating materials prior to testing, as well as in the actual testing of such plastics whose physical properties are subject to rapid change as a result of variations in atmospheric conditions. Classification of materials for conditioning, apparatus, procedure, and report.

American Society for Testing Materials, D620-41T; 1941. Tentative Method of Test for Colorfastness of Plastics to Light. To establish a laboratory procedure for evaluating the relative resistance of plastics to change in color when exposed to sunlight. Apparatus, test specimen, procedure, and report.

American Society for Testing Msterials, D621-44T; 1944. Tentative Method of Test for Deformation of Plastics Under Load. Covers the procedure for determining the deformation under compression of nonmetallic sheet and molded plastic materials, of all classes and all commercial thicknesses, intended for structural and insulating purposes. Gives requirements for nature of test apparatus, test specimens, conditioning, procedure, and report.

American Society for Testing Materials, D635-44; 1944. Method of Test for Flammability of Plastics Over 0.050 Inch in Thickness. Covers the procedure for determining the flammability of plastics in the form of sheets or plates. Apparatus, test specimens, procedure, and report.

American Society for Testing Materials, D 636-43; 1943. Method of Test for Diffusion of Light by Plastics. To differentiate the relative ability of plastics to diffuse light and is applicable to materials that scatter incident light to an appreciable extent (diffusion). It is not successfully applicable to the measurement of low ranges of scattering (haze) which are associated with slight departures from optical clarity. Gives requirements for apparatus, test specimens, procedure, numerical evaluation of diffusion, and report.

American Society for Testing Materials, D 637-43; 1943. Method of Test for Surface Irregularities of Flat Transparent Plastic Sheet. For the measurement of the surface irregularities of flat transparent plastic sheets that are ordinarily used to cover openings through which visual and instrumental observations are made. Measures the distortion and the deviation of line of sight through flat sheets of transparent plastics. Gives description of terms, apparatus, assembly of apparatus, test specimen, procedure, and report.

American Society for Testing Materials, D 638-44 T; 1944. Tentative Method of Test for Tensile Properties of Plastics. Intended for use in determining the comparative tensile properties of organic plastics when tested in the form of test specimens of standard shapes and under defined conditions of pretreatment, temperature, humidity, and testing machine speed. Definitions of terms, apparatus, classification of materials, test specimens, number of test specimens, conditioning test specimens, speed of testing, procedure, calculations, report, and appendix of definitions of terms and symbols relating to tension testing of plastics.

American Society for Testing Materials, D648-44T; 1944. Tentative Method of Test for Heat Distortion Temperature of Plastics. Gives scope, apparatus, preparation of apparatus, test specimens, conditioning test specimens, procedure, and report.

American Society for Testing Materials, D 671-42 T; 1942. Tentative Method of Test for Repeated Flexural Stress (Fatigue) of Plastics. Covers the test procedure for determining the effect of repetitions of stress by a fixed-cantilever type of testing machine designed to produce the same maximum deflection of the specimen in each cycle. This test is also applicable to plastic impregnated wood and plastic bonded plywood.

American Society for Testing Materials, D 673-44; 1944. Method of Test for Mar Resistance of Plastics. Designed to measure the resistance of glossy surfaces to abrasive action. Such materials as molded and laminated plastics, paint and lacquer films, and plated coatings may be evaluated by this method.

American Society for Testing Materials, D 674-42 T; 1942. Tentative Recommended Practice for Long-Time Tension Tests of Plastics. Covers the determination of the amount of extension of plastics due to the combined effects of tensile stress, time, temperature, and relative humidity, when tested in the form of specimens of standard shape.

American Society for Testing Materials, D 675-43T; 1943. Tentative Descriptive Nomenclature of Objects Made From Plastics. Provides simple terms, adequate to convey with maximum brevity and certainty, an accurate description of any visible characteristic of a plastic object which can be seen, but which cannot be expressed in numerical values. Gives terms relating to color characteristics, surface characteristics, clarity, soundness or structure, and shape. Defines recommended nomenclature terms and lists terms not recommended.

American Society for Testing Materials, D 695-44 T; 1944. Tentative Method of Test for Compressive Strength of Plastics. Intended for use in determining the comparative compressive properties of organic plastics in the form of test specimens of standard shape and when tested under defined conditions of pretreatment, temperature, humidity, and testing machine speed.

American Society for Testing Materials, D 696-44; 1944. Method of Test for Coefficient of Linear Thermal Expansion of Plastics. Intended for determining the reversible linear thermal expansion under exclusion of accidental factors. In general, it will not be possible to exclude all accidental factors and for this reason the method can be expected to give only approximate values.

American Society for Testing Materials, D 697-42 T; 1942. Tentative Method of Test for Water Vapor

Permeability of Plastic Sheets. Describes procedures for determining the water vapor permeability of plastic sheet made with paper, paperboard, transparent sheeting, plastic sheeting, and other sheet materials suitably bonded together with plastics.

American Society for Testing Materials, D 731-44T; 1944. Tentative Method of Test for Measuring Relative Mobility of Thermosetting Molding Powder. Designed to measure the mobility of thermosetting plastics under certain specified conditions of mold design and applied temperature and pressure. Gives requirements for apparatus, conditioning, test sample, procedure, and report.

American Society for Testing Materials, D 732-43T; 1943. Tentative Method of Test for Shear Strength of Plastics. Covers the punch type of shear test and is intended for use in determining the shear strength of test specimens of organic plastics in thicknesses from 0.005 to 0.500 in. Gives definition and requirements for apparatus, test specimen, conditioning, procedure, and report.

American Society for Testing Materials, D746-44T; 1944. Tentative Method of Test for Brittle Temperature of Plastics and Elastomers. Establishes a temperature above which a normal nonrigid plastic is not brittle in its reaction to sudden deformation. Gives requirements for apparatus, test specimens, procedure with liquid coolant, procedure with air as a coolant, and report.

American Society for Testing Materials, D 747-43T; 1943. Tentative Method of Test for Stiffness in Flexure of Nonrigid Plastics. Describes a procedure well suited for determining the relative flexibility over a wide range. Gives requirements for apparatus, test specimens, conditioning test specimens, procedure, calculations, report, and appendix.

American Society for Testing Materials, D756-44T; 1944. Tentative Methods of Tests for Resistance of Plastics to Accelerated Service Conditions. Gives scope, apparatus, test specimens, conditioning, measurements of test specimens, visual examination, procedures, physical tests, and report.

American Society for Testing Materials, D757-44T; 1944. Tentative Method of Test for Flammability of Plastics, Self-Extinguishing Type. Gives scope, apparatus, test specimens, procedure, and report.

American Society for Testing Materials, D758-44T; 1944. Tentative Method of Test for Impact Resistance of Plastics at Subnormal and Supernormal Temperatures. Gives scope, apparatus, test specimens, conditioning, procedure, and report.

American Society for Testing Materials, D759-44T; 1944. Tentative Methods of Test for Tensile and Compressive Properties of Plastics at Subnormal and Supernormal Temperatures. Gives scope, apparatus, test specimens, conditioning, procedure, and report.

American Society for Testing Materials, D 785-44 T; 1944. Tentative Method of Test for Indentation Hardness of Plastic. Gives scope, apparatus, conditioning, procedure, and report.

American Society for Testing Materials, D 790-44 T; 1944. Tentative Methods of Flexural Test of Plastics. Gives scope, apparatus, test specimens, number of test specimens, conditioning test specimens, procedure, retests, calculations, and report.

American Society for Testing Materials, D 792-44 T; 1944. Tentative Methods of Test for Specific Gravity of Plastics. Gives scope, specific gravity, apparatus, test specimens, conditioning test specimens, procedure, and calculations for plastics in final form for use and for plastics in preformed conditions.

American Society for Testing Materials, D 793-44 T; 1944. Tentative Method of Test for Short-Time Stability at Elevated Temperatures of Plastics Containing Chlorine. Gives scope, apparatus, reagents, test specimens, procedure, precautions, and calculations.

American Society for Testing Materials, D 794-44 T; 1944. Tentative Recommended Practice for Determining Permanent Effect of Heat on Plastics. Gives scope, apparatus, test specimens, determination of properties prior to heat exposure, exposure of specimens for heat effect, heat exposure schedule, and report.

American Society for Testing Materials, D 795-44 T; 1944. Tentative Recommended Practice for Accelerated Weathering of Plastics Using S-1 Bulb and Fog Chamber. Gives scope, apparatus, test specimens, procedure, and report.

American Society for Testing Materials, D 796-44 T; 1944. Tentative Recommended Practice for Molding Specimens of Phenolic Materials. Gives scope, apparatus, conditioning, and procedure.

American Society for Testing Materials, D 797-44T; 1944. Tentative Method of Test for Young's Modulus in Flexure of Natural and Synthetic Elastomers at Normal and Subnormal Temperatures. Gives scope, apparatus, test specimens, procedure, calculations, and report.

American Society for Testing Materials, D817-44T; 1944. Tentative Method of Test for Acetyl and Butyryl Content of Cellulose Acetate Butyrate. Gives scope, outline of method, apparatus, reagents, determination of total acyl content, alternative determination of total acyl content, isolation of mixed acids, determination of the molar ratios of the acids, and calculation of acetyl and butyryl content.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Plastics; Molding (Synthetic). Covers definition, classes, characteristics, uses, marketing forms, marketing customs, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Plastics; Laminated. Covers definition, characteristics, constants, construction, chemical resistance, grades, uses, forms and marketing, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Plastics; Polystyrene. Covers definition, constants, solubility, derivation and characteristics, uses, grades and forms, containers, and substitutes.

National Board of Fire Underwriters. Pyroxylin Plastic in Factories, No. 42; 1940. Standards for the storage, handling, and use of pyroxylin plastic in factories making articles therefrom. Covers synopsis, application, definitions, general requirements, isolated storage buildings, storage of raw materials, manufacturing, inspection and packing, storage of finished stock, display and sales tables, and factories using finished pyroxylin articles for assembly with other materials.

National Board of Fire Underwriters. Pyroxylin Plastic in Warehouses and Stores, No. 43; 1940. Standards for the storage and handling of pyroxylin plastic in warehouses and wholesale jobbing and retail stores. Covers introduction, scope of standards, sales and handling, storage of loose or packed articles not in shipping containers, storage of finished articles in shipping containers, storage of raw stock in shipping containers, and general requirements.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Protection of Pyroxylin Plastic. Covers buildings, dry rooms or boxes, fire protection, isolated storage buildings, and storage of raw materials in factories, including vaults and cabinets.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Pyroxylin Plastic in Factories. Standards for the storage, handling, and the use of pyroxylin plastics in factories making articles therefrom. Covers synopsis, application, definitions, general requirements for buildings, isolated storage buildings, storage of raw materials, manufacturing, inspection and packing, storage of finished stock, display and sales tables, and factories using finished pyroxylin articles for assembly with other materials.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Pyroxylin Plastic Storage and Sale. Storage and handling of pyroxylin plastic in warehouses and wholesale jobbing and retail stores. Covers sales and handling, storage of loose or packed articles not in shipping containers, storage of finished articles in shipping containers, storage of raw stock in shipping containers, and general items.

U. S. Gov., Army Air Forces. Specification No. 12043; 1944. Plastic Parts; Molded, General Specification for, Inspection of.

U. S. Gov., Federal Specification L-P-406a; 1944. Plastics; Organic, General Specifications, Test Methods. This specification establishes standard methods for testing organic plastics for conformance with the requirements of Federal specifications and was prepared in order to eliminate unnecessary or undesirable variation in testing procedure. Covers mechanical tests, thermal tests, optical tests, electrical tests, miscellaneous physical tests, performance tests, and chemical tests. Gives necessary details, notes, drawings, and photographs.

U. S. Gov., Treasury Dept., Procurement Div., No. 583; 1942. Nozzles; Garden Hose. Covers one type and size made of nonwater absorbent plastic compound. Gives requirements for construction, stem, body, discharge, adjustment, and finish; methods of sampling, inspection, and tests; and packaging, packing and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 620; 1943. Shields; Face, Plastic. Covers two types—(I) without crown protector, (II) with crown protector; and two styles—(A) clear transparent visor and (B) shaded transparent visor. Gives requirements for sizes, visor length, visor thickness, material, workmanship, general design, visor optical properties, visor temperature and moisture resistance, flammability, face clearance, visor construction, headgear, crown protector, weight, and finish; methods of sampling, inspection, and tests; packaging, packing, and marking.

893.1 INSULATING PLASTICS

References.—Insulating materials, *see* 296.3.

893.2 ELECTRICAL INSULATING PLASTICS

References.—Electrical insulating materials, *see* 719.58.

893.3 PLASTIC TABLEWARE

U. S. Gov., Federal Specification L-T-48; 1942. Tableware; Plastic. Covers three types—(I) melamine-formaldehyde resin (alpha-cellulose filler), (II) melamine-formaldehyde resin (cellulose fabric filler), and (III) any other synthetic plastics meeting the requirements of this specification. Gives requirements for color, design, uniformity, thickness, tolerances, resistance to boiling water, resistance to staining, water absorption, impact strength, discoloration by light, and odor; methods of sampling, inspection, and tests; and packaging, packing, and marking.

893.4 PLASTIC SHEETS

American Hospital Assn., 10-31. Cellulose Acetate (or Similar Material); Flame-Resisting Transparent, Sheet. Gives requirements for material, workmanship, dimensions, finish, flexibility, transparency, flame resistance, marking, light transmission, brittleness, permeability to water, and permeability to oil and gasoline.

American Society for Testing Materials, D617-44; 1944. Standard Method of Test for Punching Quality of Phenolic Laminated Sheets. Gives scope, apparatus, test specimens, preparation of apparatus, procedure for punching, rating punching quality, procedure for Rockwell hardness control test, and report; and appendices.

American Society for Testing Materials, D634-44; 1944. Standard Methods of Test for Product Uniformity of Phenolic Laminated Sheets. Gives scope, nature of test, sampling, thread count and ply thickness, acetone extractable matter, water absorption, dielectric strength parallel with laminations (step-by-step method), hot Rockwell hardness, and density.

American Society for Testing Materials, D 701-44T; 1944. Tentative Specifications for Cellulose Nitrate (Pyroxylin) Plastic Sheets, Rods, and Tubes. Gives type, general requirements, detail, requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 702-43T; 1943. Tentative Specifications for Cast Methacrylate Plastic Sheets, Rods, Tubes, and Shapes. Gives types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 708-44T; 1944. Tentative Specifications for Vinyl Chloride-Acetate Resin Sheets. Gives type, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, packing and marking.

American Society for Testing Materials, D 786-44 T; 1944. Tentative Specification for Cellulose Acetate Plastic Sheets. Gives scope, type, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking,

U. S. Gov., Army Air Forces. Specification 12025-C; 1945. Plastic-Sheet; Transparent Cellulose Acetate Base.

U. S. Gov., Army Air Forces. Specification 12032; 1942. Phenolic Sheets, Rods, Tubes, and Shapes (Fabric Base, Graphite Impregnated).

U. S. Gov., Army Air Forces. Specification 12036 (1); 1944. Phenolic Sheet; Laminated High Strength Paper Base.

U. S. Gov., Army Air Forces. Specification No.12042; 1944. Plastic; Sheet, Self Sealing Tank Backing.

U. S. Gov., Army Air Forces. Specification 12044-2; 1945. Plastic Sheet, for Instrument Flying Enclosures and Goggles.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-44; 1944.´ Plastic; Acrylic Sheet.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-63; 1944. Plastic Materials; Molded Thermosetting.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M168; 1940. Protection of Documents With Cellulose Acetate Sheeting. Relative to the lamination of documentary material with cellulose acetate sheeting as a protective measure, a study was made of the quality of various sheetings and of the suitability of the lamination processes used by seven different organizations. Three of the operators used plain sheeting applied with heat and pressure, one used sheeting containing an adhesive and applied the sheeting with heat and pressure, and three used sheeting containing an adhesive and applied the sheeting with pressure at ordinary temperature. The operators used identical papers of four different types. The sheetings were tested for the physical and chemical properties considered of importance relative to laminating quality, resistance to wear, and stability.

U. S. Gov., Navy Dept. Specification 33M1; 1941. Methacrylate, or Similar Plastic Glazing Material. Sheets for bulletin boards. Disks for airport lenses.

U. S. Gov., Navy Dept. Specification 33 P 39; 1944. Plastic; Transparent, Sheet, Vinyl Chloride-Vinyl Acetate Copolymer.

U. S. Gov., Navy Dept. Specification 33P40; 1944. Plastic; Transparent, Sheet, Cellulose Acetate.

U. S. Gov., Treasury Dept., Procurement Div., No. 727; 1945. Cellulosic-Sheet; Photographic (Clear and Frosted). Covers two types—(I) acetate base (class A, clear and class B, frosted) and (II) nitrate base, clear (grade A, general use and grade B, superior mechanical and optical use). Gives requirements for material, flammability, thermal expansion, tensile strength, elongation, flexibility, water absorption, optical displacement, and warpage; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-68; 1933. Sheet; Cellulose, Regenerated.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-11A; 1934. Celluloid; Sheet.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2970; 1940. Cellophane; Sheets.

893.5 TRANSPARENT PLASTICS

American Hospital Assn., 10-31. Cellulose Acetate (or Similar Material), Flame-Resisting Transparent, Sheet. Gives requirements for material, workmanship, dimensions, finish, flexibility, transparency, flame resistance, marking, light transmission, brittleness, permeability to water, and permeability to oil and gasoline.

American Society for Testing Materials, D 542-42, 1942. Methods of Test for Index of Refraction of Transparent Organic Plastics. Covers refractometric and microscopic methods for cast, hot-molded, and sheet materials; description of apparatus, test specimen, methods of procedure, and form of report.

American Society for Testing Materials, D 672-44 T; 1944. Tentative Method of Test for Haze of Transparent Plastics by Photoelectric Cell. Designed to measure photoelectrically the haze of transparent plastics, using specimens with substantially plane, parallel faces. This method provides a rapid and readily available means of obtaining quantitative values for haze arising from internal nonhomogeneous particles, surface scratches, and other imperfections.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-70; 1942. Covers; Light-Transmitting (for Aeronautical Lights).

U. S. Gov., Army-Navy Aeronautical Specification AN-D-7-2; 1944. Domes; Navigator's, Observing.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 233-S. Material; Transparent.

U. S. Gov., Joint Army-Navy Specification JAN-P-90; 1944. Protractors; Three-Arm, Transparent, Mark 2.

U. S. Gov., Navy Dept. Specification 33M1; 1941. Methacrylate, or Similar Plastic Glazing Material. Sheets for bulletin boards. Disks for airport lenses.

893.6 PLASTIC CONTAINERS

U. S. Gov., Army-Navy Aeronautical Specification AN-P-54-1; 1945. Plastic Film; Transparent, Moisture Impervious.

893.7 PLASTIC FOR LIGHTING FIXTURES

U. S. Gov., Federal Specification L-P-384; 1944. Plastic; Light-Diffusing (for) Lighting Fixtures. Covers two forms—(A) moulded and (B) sheets, rods, and tubes; five classes —indirect, semi-indirect, general diffusing, semi-direct, or direct; and type shall be furnished in designs, shapes, and colors as specified. Gives requirements for material, workmanship, uniformity, surface finish, machining ability, diffused illumination, operating temperature, surface brightness, over-all efficiency, light distribution, color, and cure; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

893.8 PLASTIC MATERIALS AND COMPOUNDS

American Society for Testing Materials, D 700-43T; 1943. Tentative Specifications for Phenolic Molding Compounds. Covers hot-molding thermosetting compounds consisting of essentially a phenol-formaldehyde resin either alone or intimately combined in the uncured or partially cured condition with fillers, pigments, and dyes, as required, to obtain the properties desired. Gives types, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 703-44T; 1944. Tentative Specifications for Polystyrene Molding Compounds. Gives types, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 704-44 T; 1944. Tentative Specifications for Melamine-Formaldehyde Molding Compounds. Gives types, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 705-43T; 1943. Tentative Specifications for Urea-Formaldehyde Molding Compounds. Gives grades and types, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 706-44T; 1944. Tentative Specifications for Cellulose Acetate Molding Compounds. Gives types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retests and rejection, and packing and marking.

American Society for Testing Materials, D 707-44T; 1944. Tentative Specifications for Cellulose Acetate Butyrate Molding Compounds. Gives types, general requirements, detail requirements, sampling, methods of testing, number of tests, retests and rejection, and packing and marking.

American Society for Testing Materials, D 709-44T; 1944. Tentative Specifications for Laminated Thermosetting Materials. Gives types and grades, forms, general requirements, detail requirements, permissible variations, sampling and number of tests, conditioning, methods of testing, retest and rejection, packing and marking, and appendix.

American Society for Testing Materials, D 728-44T; 1944. Tentative Specifications for Vinyl Chloride-Acetate Molding Compounds. Gives type, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 729-44T; 1944. Tentative Specifications for Vinylidene Chloride Molding Compounds. Gives types and forms, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 742-44T; 1944. Tentative Specifications for Nonrigid Vinyl Chloride-Acetate Plastics. Gives types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 743-44T; 1944. Tentative Specifications for Nonrigid Ethyl Cellulose Plastics. Gives types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packaging and marking.

American Society for Testing Materials, D 744-44T; 1944. Tentative Specifications for Nonrigid Vinyl Chloride Plastics. Gives types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 745-44T; 1944. Tentative Specifications for Nonrigid Vinyl Butyral Plastics. Gives types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 787-44 T; 1944. Tentative Specification for Ethyl Cellulose Molding Compounds. Gives scope, types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 788-44 T; 1944. Tentative Specification for Methacrylate Molding Compounds. Gives scope, types, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 789-44 T; 1944. Tentative Specification for Nylon Injection Molding Compound. Gives scope, types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 791-44 T; 1944. Tentative Method of Test for Luminous Reflectance and Transmission Characteristics and Color of Plastic Materials. Gives scope, apparatus, test specimens, procedure, calculations, illuminant, and report.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Casein and Casein Plastics. Covers definition, derivation and characteristics, uses, grades and forms, containers, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Cellulose Acetate. Covers definition, constants, solubility, derivation, uses, grades and forms, general characteristics, and substitutes.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Vulcanized Fiber. Covers definition, constants, solubility, derivation, uses, grades and forms, containers, and substitutes.

U. S. Gov., Joint Army-Navy Specification JAN-P-13; 1944. Plastic-Materials; Laminated Thermosetting Sheets and Plates.

893.9 MISCELLANEOUS PLASTIC ARTICLES

American Society for Testing Materials, D 701-44T; 1944. Tentative Specifications for Cellulose Nitrate (Pyroxylin) Plastic Sheets, Rods, and Tubes. Gives type, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

American Society for Testing Materials, D 702-43T; 1943. Tentative Specifications for Cast Methacrylate Plastic Sheets, Rods, Tubes, and Shapes. Gives types and grades, general requirements, detail requirements, sampling, methods of testing, number of tests, retest and rejection, and packing and marking.

Society of Automotive Engineers. Aeronautical Material Specification 3630; 1944. Flexible Plastic Extrusions. Gives requirements for form and color, application, quality, requirements, samples, dimensions and tolerances, reports, identification, packing and marking, approvals, and rejections.

Society of Automotive Engineers. Aeronautical Standard 42; 1944. Cap; Thread Protector, Single and Dual Propeller Shafts. Black cellulose acetate material. Drawing with table giving dimensions.

U. S. Gov., Army Air Forces. Specification 12032; 1942. Phenolic Sheets, Rods, Tubes, and Shapes (Fabric Base, Graphite Impregnated).

U. S. Gov., Army Air Forces. Specification 12035; 1943. Rod, Cellulose-Nitrate-Base, Extruded.

U. S. Gov., Army Air Forces. Specification 32212-A; 1940. Phenolic-Material; Molded.

U. S. Gov., Army Air Forces. Specification 40726 (2); 1944. Trainer; Map Projection, Type 0-51 (Globe).

U. S. Gov., Army-Navy Aeronautical Specification AN-K-3; 1944. Knobs; Pointer.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-48a; 1944. Pumps; Plastic, Hand, Air.

U. S. Gov., Federal Specification L-C-566; 1942. Amendment 3; 1944. Combs; Plastic. Covers one type and one grade. Gives requirements for material, workmanship, design, sizes, color, deformation in hot water, stiffness of teeth, thumb test, flammability, and accelerated aging test; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-R-83; 1944. Rulers; Parallel.

U. S. Gov., Navy Dept. Specification 12T10a; 1944. Treads; Safety, Plastic.

U. S. Gov., Navy Dept. Specification 18T27; 1944. Trays; Photographic, Plastic.

U. S. Gov., Navy Dept. Specification 30A1; 1944. Accessories; Lavatory and Shower-Stall, Plastic.

U. S. Gov., Navy Dept. Specification 30P2; 1944. Plugs; Drain, Plastic.

U. S. Gov., Navy Dept. Specification 33T5; 1944. Tubing; Plastic (Elastomer).

U. S. Gov., Navy Dept. Specification 42C24; 1944. Cuspidors; Plastic.

U. S. Gov., Navy Dept. Specification 42P15; 1944. Plastic-Ware (Alternate for Hardware).

U. S. Gov., Navy Dept. Specification 42 T 1e; 1943. Tags; Key, and Rings; Key.

U. S. Gov., Navy Dept. Specification 45P3; 1944. Plugs; Heat-Exchanger-Tube (Phenolic-Material, Laminated).

U. S. Gov., Navy Dept. Specification 64T8; 1944. Trays; Serving, Plastic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40780; 1944. Syringe; Oil-Dispensing, Plastic.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-39a; 1944. Trays; Serving, Non-Metallic. Covers one grade and three types—(I) rectangular trays, (II) oval trays, and (III) round trays. Gives requirements for sizes, material, workmanship, construction, finish, color, odor, resistance to impact, impact strength, rigidity, chemical resistance, resistance to hot water, marking, and details for each type; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

900-999 COMMODITIES NOT ELSEWHERE CLASSIFIED

910-919 SCIENTIFIC AND PROFESSIONAL APPARATUS AND SUPPLIES

910. GENERAL ITEMS

American Institute of Chemical Engineers. Standard System of Nomenclature for Chemical Engineering Unit Operations, 1944. Covers general principles of letter symbol standardization and gives symbols and nomenclature of chemical engineering with typical units and recommended abbreviations.

American Institute of Electrical Engineers, endorsing sponsor. American Standards Assn., Z17.1-1936. Preferred Numbers. Tables of preferred numbers for use in size standardization with definite relations between the numbers in each of four standard series.

American Institute of Electrical Engineers, 17f; 1928. Joint sponsor with American Assn. for the Advancement of Science, American Society of Civil Engineers, American Society of Mechanical Engineers, and Society for the Promotion of Engineering Education. Mathematical Symbols. Approved as American standard Z 10f-1928 by the American Standards Assn. List of letter symbols for mathematical terms.

American Society of Mechanical Engineers. American Standards Assn., Z 15.1-1932. Engineering and Scientific Charts for Lantern Slides. A valuable set of rules for drawing the original charts and for their reproduction as lantern slides. Standard also specifies types and sizes of lettering, different line widths, and sizes of symbols commonly used in graphs. An appendix contains a table of commercial lettering templates and lettering pens with which charts may be easily reproduced in the manner recommended.

American Society of Mechanical Engineers. American Standards Assn., Z 15.3-1943. Engineering and Scientific Graphs for Publication. Intended for the guidance of authors and draftsmen who are preparing graphs for reproduction in engineering and technical publications. Covers design and layout, construction of original graph to be used for reproduction, handling of finished illustrations, and appendices.

American Society of Mechanical Engineers, joint sponsor with American Gear Manufacturers Assn. American Standards Assn., B 6.5-1943. Letter Symbols for Gear Engineering. To establish a uniform practice in mathematical notation for equations and formulas dealing with toothed gearing. Covers manuscripts, symbols, subscripts, conflicts, topography, lists English alphabet for gear engineering symbols, lists Greek letters employed, lists recommended plan for subscripts, and lists general and special letter symbols for gear engineering.

American Society of Mechanical Engineers, joint sponsor with American Assn. for the Advancement of Science, American Institute of Electrical Engineers, American Society of Civil Engineers, Society for the Promotion of Engineering Education. American Standards Assn., Z 10.1-1941. Abbreviations for Scientific and Engineering Terms.

American Society of Mechanical Engineers, Co-sponsors with American Assn. for the Advancement of Science, American Institute of Electrical Engineers, American Society of Civil Engineers, and Society for the Promotion of Engineering Education. American Standards Assn., Z 10.3-1942. Letter Symbols for Mechanics of Solid Bodies. Includes general principles of letter symbol standardization and letter symbols for concepts in mechanics of solid bodies.

American Society of Mechanical Engineers, joint sponsor with American Assn. for Advancement of Science, American Society of Civil Engineers, American Institute of Electrical Engineers, and Society for Promotion of Engineering Education. American Standards Assn., Z10f-1928. Mathematical Symbols. List of standard mathematical letter symbols.

American Society of Mechanical Engineers, sponsor. American Standards Assn., Z15.2-1938. Time Series Charts. A manual of design and construction including line charts, girds, scale, selection, and designations; curves, curve selection, and designations; and supplementary column, surface, and rate-of-change charts.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 2—Pressure Measurement, Chapters 2 and 3; 1936. Pressure reduction to Bernoulli's Theorem, static holes, static tubes, impact tubes are subjects dealt with in chapter 2. In chapter 3 are instructions for screwed pipe and tubing for pressure measurement.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 16—Density Determinations, 1931. Discusses available methods for determining specific gravity.

American Society for Testing Materials, E 29-40 T; 1940. Tentative Recommended Practices for Designation of Numerical Requirements in Standards. To assist the various standing committees in the use of uniform terms and conventions in expressing numerical requirements in specifications and methods of testing.

American Standards Assn., B48.1-1933. American Standard Practice for Inch-Millimeter Conversion for Industrial Use.

American Standards Assn. Defense Emergency Standards Z1.1-1941 and Z1.2-1941. Guide for Quality Control and Control Chart Method of Analyzing Data. A guide for handling problems concerning the economic control of quality of materials and manufactured products. It has particular reference to methods of collecting, arranging, and analyzing inspection and test records in a manner designed to detect lack of uniformity of quality. It provides also a graphical summary of the data that are being analyzed to assist judgment in determining whether there is evidence of lack of control, and whether there is justification in using the summary as a basis for predicting the future performance of the processes that give rise to the data that are being analyzed.

American Standards Assn., Z 1.3-1942. Control Chart Method of Controlling Quality During Production. The principles of procedure are given in general terms and illustrations show how these principles might be applied in specific cases. Covers preliminary steps in setting up a control precedure, starting the control chart, using the control chart during production, illustrative examples, glossary of symbols and terms, and appendices.

American Standards Assn., Z25.1-1940. Rules for Rounding Off Numerical Values. Covers problem of rounding, recommended rules, explanation of rules, illustration, sum and average unchanged, places retained, and gives table for rounding off numbers in 6, 5, 4, 3, 2, and 1 places.

Heating, Piping and Air Conditioning Contractors National Assn. Engineering Standards, Part V; 1945. Graphic Symbols for Use on Drawings and Scheme for the Identification of Piping Systems. Contains two sections. The first gives graphical symbols for use on drawings and the second methods of identifying piping systems.

Industrial Management Society. An Occupational Rating Plan for Hourly and Salaried Occupations, 1937. Gives basic principles of uniformly rating or classifying various industrial operations as: Job conditions or environment, physical requirements, and mental requirements; grading of job—not operator—index values of various characteristics, rate range, and seasonal employment; hourly occupational master sheets, conversion curve for hourly rated occupations, for additional characteristics of salaried office and executive employees, list of sample occupations and gradings, and specimen of job requirements analysis sheet.

National Safety Council, joint sponsor with International Assn. of Industrial Accident Boards and Commissions and National Council on Compensation Insurance. American Standards Assn., Z16.1-1937. Method of Compiling Industrial Injury Rates.

National Safety Council, joint sponsor with National Council on Compensation Insurance and International Assn. of Industrial Accident Boards and Commissions. American Standards Assn., Z16.2-1941. Recommended Practice for Compiling Industrial Accident Causes. Part I, Selection of Accident Factors—defines the various classes of disabilities, the time charges to be assigned to the disabilities, definitions of frequency and severity rates, and general rules for the compilation of rate statistics. Part II, Detailed Classification of Accident Factors—presented in five sections: (1) Agency and agency part, (2) the unsafe mechanical or physical condition, (3) the accident type, (4) the unsafe act, and (5) the unsafe personal factor.

911. PHOTOGRAPHIC GOODS

911.0 GENERAL ITEMS

American Standards Assn. Z 38.2.2-1942. Photographic Exposure Computer (American Emergency Standard). Covers latitude, time of year, hour of day, sky conditions, shaded scenes, scene structure, lens opening and shutter time, doubtful conditions, interiors or very dim exteriors, electrically lighted interiors, dawn and dusk, smoke, snow, extreme close-ups, copying, night flash pictures, outdoor night flashbulb, and flood lamp exposures.

American Standards Assn., Z52.15-1944. Method of Making Intermodulation Tests on Variable Density 16-Mm. Sound Motion Picture Prints (American War Standard). Describes the intermodulation method of measuring the sound distortion introduced during the processing of 16-mm. variable density sound motion picture release prints. Gives test method and test equipment.

American Standards Assn., Z52.24-1944. Reduction Printing from 35-Mm. to 16-Mm. Motion Picture Film—16-Mm. Positive Aperture Dimensions and Image Size for Positive Prints made From 35-Mm. Negatives (American War Standard). Gives drawing and table showing dimensions.

American Standards Assn., Z52.25-1944. Reduction printing From 35-Mm. to 16-Mm. Motion Picture Film—Negative Aperture Dimensions and Image Size for 16-Mm. Duplicate Negatives Made From 35-Mm. Positive Prints (American War Standard). Gives drawing and table showing dimensions.

American Standards Assn., Z52.26-1944. Contact Printing of 16-Mm. Motion Picture Film—Printer Aperture Dimensions for Contact Printing 16-Mm. Positive Prints From 16-Mm. Negatives (American War Standard). Gives drawing and table showing dimensions.

American Standards Assn., Z52.27-1944. Contact Printing of 16-Mm. Motion Picture Film—Printer Aperture Dimensions for Reversal and Color Reversal Duplicate Prints (American War Standard). Gives drawing and table showing dimensions.

American Standards Assn., Z52.39-1944. Method of Making Cross-Modulation Tests on Variable Area 16-Mm. Sound Motion Picture Prints (American War Standard). Describes the cross-modulation method of measuring high-frequency distortion introduced during the processing of 16-mm. variable area sound motion picture release prints. Gives test method and test equipment.

Optical Society of America, sponsor. American Standards Assn., Z 38.2.1-1943. Standard Method for Determining Photographic Speed and Speed Number. This method of determining speed and speed number applies to roll films, film packs, and miniature camera films intended for the making of monochromatic, continuous-tone negatives in pictoral photography, exclusive of photography in the infrared. Covers discussion of problem and explanation of terms, determination of speed and speed numbers of a specific sample, and determination of speed and speed number of a product.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.33-1941. Recommended Practice for Motion Picture. Nomenclature for Electrical Filters.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.8.1-1944. Practice for Temperature of Processing Solutions. Gives temperature of photographic processing solutions.

911.1 CAMERAS AND CAMERA DEVICES

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.7-1941. 16-Mm. Silent Motion Picture Film, Camera Aperture. Dimensional Standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.9-1941. 16-Mm. Silent Motion Picture Film, Emulsion Position in Camera—Negative.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.19-1941. 8-Mm. Silent Motion Picture Film, Camera Aperture. Dimensional Standards.

U. S. Gov., Army Air Forces. Specification 31013-C; 1944. Camera; Aircraft, Type B-1 (16-Mm. Silent Motion Picture).

U. S. Gov., Army Air Forces. Specification No. 31293; 1944. Camera; Ground, Type C-4.

U. S. Gov., Army Air Forces. Specification No. 31298; 1943. Camera; Aircraft, Type K-27 (12-In. Lens, 9- by 18-In. Negative).

U. S. Gov., Army Air Forces. Specification 31300A-1944. Camera; Aircraft, Type A-6, 35-Mm. Silent Motion Picture.

U. S. Gov., Army Air Forces. Specification No. 31301; 1945. Camera; Aircraft, Type A-7 (35-Mm. Silent Motion Picture).

U. S. Gov., Army Air Forces. Specification 31336-A; 1943. Control; Multi-Camera, Type A-2 (Aircraft).

U. S. Gov., Army Air Forces. Specification No. 31339; 1943. Control; Integral Overrun (Gun Camera, 16-Mm. 24 Volts, D. C.).

U. S. Gov., Army Air Forces. Specification No. 31355; 1944. Camera; Aircraft, Type S-7.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C428; 1940. A Test of Lens Resolution for the Photographer. This circular provides the photographer with a set of charts by which the resolving power of a photographic lens may be numerically measured with respect to a definite scale of values. A detailed description is given of the procedure and technique to be followed in order that comparable values may be obtained by different observers. The test provides an objective method of testing a photographic lens.

U. S. Gov., U. S. Army Army Air Forces. Specification 75-23C; 1940. Camera; Aircraft, Type K-3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-52; 1939. Camera; Aircraft, Type K-7C.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-54; 1939. Camera; Machine Gun, Type H-2, Aircraft, 16-Mm.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-56; 1940. Camera; Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-60; 1940. Camera; Ground, Type C-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-61; 1940. Camera; Ground, Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-68-A; 1944. Camera; Aircraft, Type A-1B, 35-Mm. Silent Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-70A; 1942. Camera; Ground, Type C-3.

U. S. Gov., U. S. Army, Army Air Corps. Specification 75-72; 1940. Camera; Machine Gun. Type H-3, Aircraft, 16-Mm., 24-Volt.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-75; 1940. Camera; Machine Gun, Type H-1, Aircraft, 16-Mm.

U. S. Gov., U. S. Army, Army Air Corps. Specification 75-92B; 1943. Camera; Type K-18A, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-94-C; 1944. Camera; Aircraft, Type K-17C.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-97C; 1943. Camera; Type K-19B, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-152; 1941. Cameras; Aircraft, Type A-3, 35-Mm., Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-183; 1942. Camera; Aircraft, Type L-2A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-188A; 1942. Intervalometer; Camera, Type B-3B, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-202; 1942. Camera; Aircraft, Type A-4, Bomb Spotting, 35-Mm., Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-210; 1942. Camera; Aircraft, Type K-21.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-211; 1942. Intervalometer; Camera, Type B-4, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-218; 1942. Camera; Aircraft, Type K-25.

U. S. Gov., U. S. Army, Army Air Corps. Specification 75-221; 1943. Camera; Aircraft, Type K-22.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-227; 1943. Camera; Aircraft, Type K-20, 4- by 5-Inch.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-234; 1943. Camera; Aircraft, Type K-24.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-238; 1943. Camera; Torpedo Training, Type U-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-239A; 1943. Magazine; Camera, Type A-8, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-243; 1943. Camera; Aircraft, Type B-2, 16-Mm., Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-246B; 1944. Camera; Aircraft, Type A-5, 35-Mm., Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-251; 1943. Camera; Gun, Type AN-N-4, 35-Mm. Lens, Plain, 16-Mm., 24-Volt, D. C.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-260; 1943. Adapter; Camera, Type A-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-279; 1943. Intervalometer; Camera, Type B-5, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-282; 1943. Camera; Aircraft, Type T-5.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-341; 1943. Cover; Camera, Type B-1, Electrically Heated, Type K-21 Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-344; 1943. Cover; Camera, Type B-3, Electrically Heated, Type K-18 Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-360; 1944. Shutter; Auxiliary, Night Camera, Photoelectric.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-366-A; 1945. Camera; Gun, Type AN-N6 (35-Mm. Lens, 16-Mm., 24 Volts, D. C.).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-422A; 1944. Camera; Aircraft, Type A-8 (35-Mm. Silent Motion Picture).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-426; 1944. Cover; Camera, Type B-7 (Electrically Heated, Type K-24 Camera).

References.—Sound recording and reproducing equipment, *see* 718.7; testing of lenses, *see* 914.0.

911.2 FILMS, PLATES, AND REELS

American Standards Assn., Z52.2-1944. Test Film for Checking Adjustment of 16-Mm. Sound Motion Picture Projection Equipment (American War Standard). Gives scope and purpose, test film, instructions for use of film, and appendix.

American Standards Assn., Z52.8-1944. Specification for Multi-Frequency Test Film Used for Field Testing 16-Mm. Sound Motion Picture Projection Equipment (American War Standard). Gives scope and purpose and test film details.

American Standards Assn., Z52.9-1944. Specification for 3000-Cycle Flutter Test Film for 16-Mm. Sound Motion Picture Projectors (American War Standard) Gives scope and purpose and test film details.

American Standards Assn., Z52.10-1944. Specification for Buzz-Track Test Film for 16-Mm. Sound Motion Picture Projectors (American War Standard). Gives scope and purpose, test film, inspection of prints, and figure showing buzz-track dimensions.

American Standards Assn., Z52.11-1944. Specification for Sound-Focusing Test films for 16-Mm. Sound Motion Picture Projection Equipment (American War Standard) Gives scope and purpose and test films.

American Standards Assn., Z52.16-1944. Sound Records and Scanning Area of 16-Mm. Sound Motion Picture Prints (American War Standard). Gives drawings with dimensions for printed area, variable area and veriable density squeeze records, full width variable density record, and scanned area.

American Standards Assn., Z52.17-1944. Specification for 400-Cycle Signal Level Test Film for 16-Mm. Sound Motion Picture Projection Equipment (American War Standard). Gives scope and purpose and test film details.

American Standards Assn., Z52.19-1944. Leaders, Cues, and Trailers for 16-Mm. Sound Motion Picture Release Prints Made From 35-Mm. Preprint Material (American War Standard). Gives protective leader, test leader, identification leader, synchronizing leader, picture section, runout trailer, identification trailer (end-of-part title), and protective trailer.

American Standards Assn., Z52.20-1944. Positive and Negative Splices for Processed 16-Mm. Sound Motion Picture Film (American War Standard). Gives drawing showing diagonal, straight, and curved splice together with table giving dimensions.

National Board of Fire Underwriters. Nitrocellulose Motion Picture Film, No. 40; 1939. Storage and handling of film includes construction of containers and transportation of film.

National Board of Fire Underwriters. Photographic and X-Ray Nitrocellulose Films, No. 41; 1930. Regulations for storage and handling in stores, warehouses, commercial studios, hospitals, and laboratories, etc; maximum volume of cabinets, vaults, and outside storage houses.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Protection of Nitrocellulose Motion-Picture Film. Covers sprinklers and other fire protection appliances, film cabinets, film vaults, motion picture film exchanges, motion picture film laboratories, and motion picture studios.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Protection of Photographic and X-Ray Nitrocellulose Films. Covers general storage of unexposed films including stores, warehouses and wholesale storage, and portrait and commercial studios; storage of film negatives including vented cabinets, vented storage vaults (inside), and outside storage houses; and general requirements for both unexposed films and film negatives.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Nitrocellulose Motion Picture Film. Standards for the storage and handling of nitrocellulose motion picture film. Covers construction and arrangement of buildings, electrical equipment, heating equipment, sprinklers and other fire protection appliances, storage of film, film cabinets, film vaults, handling of film, motion picture projection and special processes, and special provisions for special occupancies.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Photographic and X-Ray Nitrocellulose Films. Standards for the storage and handling of photographic and X-ray nitrocellulose films. Covers general storage of unexposed films, storage of film negatives, and general items applying to both unexposed films and film negatives.

Optical Society of America. American Standards Assn., Z 38.1.1-1941. Film Pack Tabs and Films. Gives diagram and table showing dimensions.

Optical Society of America. American Standards Assn., Z 38.1.2-1941. Film Pack Cases. Gives diagram and table showing dimensions.

Optical Society of America. American Standards Assn., Z 38.1.3-1941. 70-Mm. Perforated (and Unperforated) Film (Cutting and Perforating Standard). Gives diagram and table showing dimensions and tolerances.

Optical Society of America, sponsor. American Standards Assn., Z 38.1.16-1943 to Z 38.1.24-1943, inclusive. Dimensions for Amateur Roll Film, Backing Paper, and Film Spools. Gives diagrams and tables showing dimensions for amateur roll film spools—numbers 1 to 9, inclusive.

Optical Society of America, sponsor. American Standards Assn., Z38.1.25-1944. American Standard Dimensions for Industrial X-Ray Sheet Film (Inch Sizes). Gives table showing nominal, minimum, and maximum dimensions for various film sizes.

Optical Society of America, sponsor. American Standards Assn., Z38.1.26-1944. American Standard Dimensions for Graphic Arts Sheet Film (Inch Sizes). Gives table showing nominal, minimum, and maximum dimensions for various film sizes.

Optical Society of America, sponsor. American Standards Assn., Z38.1.27-1944. American Standard Dimensions for Medical X-Ray Sheet Film (Inches and Centimeter Sizes). Gives tables showing nominal, minimum, and maximum dimensions, in inches and centimeters, for various film sizes.

Optical Society of America, sponsor. American Standards Assn., Z38.1.28-1944. American Standard Dimensions for Professional Portrait and Commercial Sheet Film (Inch Sizes). This standard omits obsolete and seldom used sizes. Gives table showing nominal, minimum, and maximum dimensions for various film sizes.

Optical Society of America, sponsor. American Standards Assn., Z38.1.29-1944. American Standard Dimensions for Professional Portrait and Commercial Sheet Film (Centimeter Sizes). Gives table showing nominal, minimum, and maximum dimensions for various film sizes.

Optical Society of America, sponsor. American Standards Assn., Z38.1.30-1944. American Standard Dimensions for Photographic Dry Plates (Inch Sizes). Gives table showing cutting size including nominal size, standard, tolerance, and minimum and maximum thickness for various sizes; and squareness.

Optical Society of America, sponsor. American Standards Assn., Z38.1.31-1944. American Standard Dimensions for Photographic Dry Plates (Centimeter Sizes). Gives table showing cutting size including nominal size, standard, tolerance, and minimum and maximum thickness for various sizes; and squareness.

Optical Society of America. American Standards Assn., Z 38.31-1943. Definition of Safety Photographic Film. Photographic films are classified as safety photographic film if they are difficult to ignite, slow burning, and low in nitrogen content. Covers ignition time, burning time, and nitrogen content.

Optical Society of America, sponsor. American Standards Assn., Z38.7.8-1944. Proposed American Standard Practice for Microfilms. Microfilm shall mean a transparent flexible material carrying microphotographs for optical, but not cinematographic, projection or viewing. Covers material, format and placement, leader and trailer, title frame, and reels.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.2-1941. 35-Mm. Sound Motion Picture Film, Emulsion and Sound Record Positions in Camera—Negative.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.3-1941. 35-Mm. Sound Motion Picture Film, Emulsion and Sound Record Positions in Projector—Positive (for Direct Front Projection).

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.5-1941. 16-Mm. Silent Motion Picture Film, Cutting and Perforating Negative and Positive Raw Stock. Dimensions and tolerances.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.12-1941. 16-Mm. Sound Motion Picture Film, Cutting and Perforating Negative and Positive Raw Stock. Dimensions and tolerances.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.13-1941. 16-Mm. Sound Motion Picture Film, Camera Aperture. Dimensional standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.14-1941. 16-Mm. Sound Motion Picture Film, Projector Aperture Dimensional Standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.15-1941. 16-Mm. Sound Motion Picture Film, Emulsion and Sound Record Positions in Camera—Negative.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.16-1941. 16-Mm. Sound Motion Picture Film, Emulsion and Sound Record Positions in Projector—Positive (for Direct Front Projection).

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.17-1941. 8-Mm. Motion Picture Film, Cutting and Perforating Negative and Positive Raw Stock. Dimensions and tolerances.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.21-1941. 8-Mm. Silent Motion Picture Film, Emulsion Position in Camera—Negative.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.24-1941. 16-Mm. Silent Motion Picture Film, Film Splices, Negative and Positive.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.25-1941. 16-Mm. Sound Motion Picture Film, Film Splices—Negative and Positive.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.26-1941 and Z22.27-1941. Sensitometry. Photographic Density.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.31-1941. Recommended Practice for Motion Picture Film. Safety Film.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.32-1941. Recommended Practice for Motion Picture Film, Theater Sound Fader Setting Instructions.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.34-1944. Cutting and Perforating Negative Raw Stock. For 35-mm. motion picture film. Gives drawing and table showing dimensions and tolerances.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.36-1944. Cutting and Perforating Positive Raw Stock. For 35-mm. motion picture film. Gives drawing and table showing dimensions and tolerances.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.37-1944. Raw Stock Cores. For 35-mm. motion picture film. Gives drawing and table showing dimensions and recommended practice.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.38-1944. Raw Stock Cores. For 16-mm. motion picture film. Gives drawing and table showing dimensions and recommended practice.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.1.41-1944. Dimensions for Leaders, Trailers, and Roll Film for Aerial Photography. Gives table showing nominal film width, actual film width, and leader and trailer width.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.1.42-1944. Designation of Emulsion side of Photographic Sheet Films. Gives drawing and data for size of notches and location of notches.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-40; 1944. Film; Aerial Photographic.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R165-36; 1936. Photographic Film for Miniature Copies of Records. This recommendation establishes a simplified list of stock widths of photographic film.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Standard for Permanent Record Photographic

Microcopying Film, Gelatin-Silver Halide Emulsion Type, 1943. The exposed and processed film shall be of such a type that the quality of the image shall remain permanent under ordinary storage conditions. Gives requirements for emulsion, processing, hypo content of emulsion, flexibility, film base, relative viscosity, pH stability, and nitrogen content.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Standard for Temporary Record Photographic Microcopying Film, Gelatin-Silver Halide Emulsion Type, 1943. The exposed and processed film shall be of such a type that no serious loss in the quality of the image shall result within five years after processing when the film is kept under ordinary storage conditions. Gives requirements for film base, emulsion, processing, hypo content of emulsion, flexibility, and burning time test.

U. S. Gov., Joint Army-Navy Specification JAN-F-31; 1944. Film; Photographic, General Specification for.

U. S. Gov., Joint Army-Navy Specification JAN-F-32; 1944. Film; Photographic, Aerial.

U. S. Gov., Joint Army-Navy Specification JAN-F-33; 1944. Film; Photographic, Motion-Picture.

U. S. Gov., Joint Army-Navy Specification JAN-F-34; 1944. Film; Photographic, Miscellaneous Roll.

U. S. Gov., Joint Army-Navy Specification JAN-F-35; 1944. Film; Photographic, Cut-Sheet and Pack.

U. S. Gov., Joint Army-Navy Specification JAN-F-36; 1944. Film; Photographic, Photomechanical.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-189; 1942. Reel; Film, 35-Mm. Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-190A; 1943. Reel; Film, 16-Mm. Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-203; 1942. Film; Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-258; 1943. Clip; Photographic Film.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-284; 1943. Spool; Roll, Film, Storage, 9 1/2-in.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-290; 1943. Leader; Film, Motion-Picture, Film Processing Machine.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-296; 1943. Plate; Photographic, Lantern Slide, in three Degrees of Contrast.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-336; 1943. Film; Direct Copy Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-340; 1943. Film; Transparency, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-362; 1944. Film; Direct Positive Sensitized, Dry Processing.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-364; 1944. Film, Filters, and Chemicals (for Reversal, Ground Color Photography).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-373; 1944. Plates; Photographic Ferrotype (Size 22 by 26 In., Chrome Plated).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-386; 1944. Reel; 35-Mm. Film Storage (100-Ft. Capacity).

U. S. Gov., U. S. Army, Signal Corps. Specification 75-57; 1941. Sound Motion Picture Prints.

References.—Shipping containers for film, *see* 954.21, 958.3; storage of motion picture film, *see* 518.50; cellulose acetate and cellulose nitrate products, *see* 846.5; lantern slides, *see* 482.

911.3 PHOTOGRAPHIC PAPER

Optical Society of America. American Standards Assn., Z38.1.4-1942. Dimensions of Photographic Paper. For leaders for sensitized photographic paper rolls (where leaders are required). Refers to those commonly used for light protective purposes where the length of the leader has no particular bearing on the operation of an exposing machine. Covers geophysical recording roll leaders, photocopy roll leaders, and limit signals for geophysical recording rolls.

Optical Society of America. American Standards Assn., Z 38.1.5-1943. Dimensions of Photographic Papers (Inch Width Rolls). Gives requirements for width, length, allowance for splices, and method of measuring.

Optical Society of America. American Standards Assn., Z 38.1.6-1943. Dimensions of Photographic Papers (Centimeter Size Sheets and Rolls). Gives requirements for nominal size, tolerance, and method of measuring cut sheets and for nominal width, tolerance, length of rolls, allowance for splices, and method of measuring rolls.

Optical Society of America, sponsor. American Standards Assn., Z 38.1.7-1943 to Z 38.1.15-1943, inclusive. Dimensions for Amateur Roll Film, Backing Paper, and Film Spools. Gives diagram and dimensions for amateur roll film and backing paper—numbers 1 to 9, inclusive.

Society of Motion-Picture Engineers, sponsor. American Standards Assn., Z38.1.44-1944. Designation for Thickness of Photographic Paper. Gives table showing weight designation and thickness.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-157B; 1943. Paper; Photographic.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-6; 1923. Paper; Bromide, PMC No.5, 36-In., 50-Yd. Roll.

References.—Standard sizes of photographic paper, *see* 478.34; photographic blotting paper, *see* 471.1.

911.4 PHOTOGRAPHIC APPARATUS

American Standards Assn., Z52.35-1944. Photographing Aperture of 35-Mm. Motion Picture Cameras (American War Standard). Gives drawing and table showing dimensions.

Optical Society of America. American Standards Assn., Standards Assn., Z38.4.3-1942. Distance Scales Marked in Feet. Covers requirements for distance scales marking or the focusing scale, and within the limits of the range or form of the camera and lens the distance markings shall be indicated in feet selected from those given.

Optical Society of America. American Standards Assn., Z38.4.5-1942. Shutter Cable Release Tip and Socket with Taper Thread. Diagrammatical dimensional drawing.

Optical Society of America. American Standards Assn., Z38.4.6-1942. Shutter Cable Release Tip and Socket With Straight Thread. Diagrammatical dimensional drawing.

U. S. Gov., Army Air Forces Specification No. 31376; 1944. Control; Camera Intervalometer, Type F-1, Bombardment Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-I-25; 1944. Intervalometers; Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-53B; 1943. Filter; Photographic, for Aircraft Cameras.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-78; 1940. Magazine; Aircraft, Camera, Type B-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-126B; 1942. Magazine; Camera, Type A-5A, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-188-A; 1942. Intervalometer; Camera, Type B-3B (Aircraft).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-195A; 1943. Computer; Type F-2, Time Interval, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-211; 1942. Intervalometer; Camera, Type B-4, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-242; 1943. Cover; Camera, Electrically Heated, General Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-261; 1943. Intervalometer; Camera, Type B-7, Aircraft.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-265; 1943. Timer; Photographic, Interval.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-269; 1943. Timer; Photographic, Continuous.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-275; 1943. Director; Pilot, Type C-1, Solar Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-281; 1943. Unit; Filter, Photographic, Ground Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-342; 1943. Cover; Camera, Type B-2 (Electrically Heated—Type K-19 Series Cameras).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-343; 1943. Cover; Camera, Type B-4 (Electrically Heated—Types K-17 and K-17B Cameras With 6-In. Lens Cone).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-345; 1943. Cover; Camera, Type B-6 (Electrically Heated—Types K-17 and K-17B Cameras With 24-In. Lens Cones).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-346; 1943. Cover; Camera, Type B-5 (Electrically Heated—Types K-17 and K-17B Cameras With 12-In. Lens Cones).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-354; 1944. Filters; Photographic, Vignetting Correction, 6-In., F/6.3 Lens.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-355; 1944. Magazine; Aircraft Camera, Type A-9, 9 by 9-In. Capacity.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-363; 1944. Erector; Assembly, "AN" Gun Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-367; 1944. Filters; Photographic, for Ground Cameras.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-421; 1944. Filter Unit; Type A-9 (for 24-In.F/6 Lens), Types K-17 and K-18 Cameras.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-41B; 1942. Meter; Exposure PH-77-C for Still Photography.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-77A; 1941. Exposure Meter PH-252-( ), for Use With Motion Picture Cameras.

911.5 CAMERA MOUNTS

Optical Society of America. American Standards Assn., Z38.4.1-1942. Cameras (Tripod Connections for American Cameras). Diagrammatical dimensional drawings showing camera socket, spacer, and tripod screw.

Optical Society of America. American Standards Assn., Z38.4.2-1942. Cameras (Tripod Connections for European Cameras With Adapter for American Tripods). Diagrammatical dimensional drawings showing camera, adapter, and tripod screw.

U. S. Gov., Army Air Forces. Specification No. 24883; 1943. Mount; Gun Camera, Type B-1.

U. S. Gov., Army Air Forces. Specification 24959-1; 1944. Mount; Gun Camera, Type C-1.

U. S. Gov., Army Air Forces. Specification No. 31369; 1944. Mount; Vertical Camera, Type A-27A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-37B; 1944. Mount; Vertical Camera, General Specification for.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-137-A; 1944. Mount; Camera, Type A-6.

U. S. Gov., U. S. Army, Army Air Corps. Specification 75-181B; 1944. Mount; Vertical Camera, Type A-11A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-245-B; 1944. Mount; Vertical Camera, Type A-17A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-349; 1943. Mount; Camera, Type A-23.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-462; 1944. Mount; Automatically Stabilized Vertical Camera, Type A-158.

911.6 PHOTOGRAPHIC LENSES

Optical Society of America. American Standards Assn., Z38.4.4-1942. Focal Lengths of Lenses, Marking. Focal length of lenses marked on the lens mounts shall be in either mm. (millimeters) or cm. (centimeters).

Optical Society of America. American Standards Assn., Z38.4.7-1943. Lens Aperture Markings. Covers symbol for relative aperture of lens, measured diameter of the maximum aperture as seen from the front of the lens, standard series of diaphragm marking, and maximum relative aperture marked on a lens.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.4.10-1944. Dimensions of Front Lens Mounts for Cameras. Gives table showing preferred standard diameters, secondary standard diameters, and tolerances.

U. S. Gov., Army Air Forces. Specification No. 31374; 1944. Lens; Photographic, 48 In. F/6.3 Telephoto.

U. S. Gov., Army Air Forces. Specification No. 31386; 1945. Posts; Lens Focusing, for Aerial Cameras.

U. S. Gov., Navy Dept. Specification 18 G 7; 1943. Glass Surfaces; Optical, Treatment of.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-50; 1939. Filter Unit; Lens, Type A-4, for Type K-7C Aircraft Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-93; 1940. Filter Unit; Lens, Type A-6, for Type K-18 Aircraft Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-95; 1941. Filter Unit; Lens, Type A-5, for Type K-17, Aircraft Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-144D; 1944. Lens Cone; Aircraft Camera 6, 12, and 24-In. (K-17 Camera Series).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-145A; 1943. Lens; Photographic, 24-In., F/6.0.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-146-B; 1945. Lens; Photographic, 6-In., F/6.3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-184; 1941. Lens; Photographic, 12-In., F/5.0.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-149; 1941. Lens; Photographic, 8 1/4-In., F/5.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-154; 1941. Lens Cone; Aircraft Camera, Type K-3B.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-184; 1942. Shutter and Lens Assembly; 30-Cm., F/4.5 Lens.

U. S. Gov., U. S. Army, Army Air Corps. Specification 75-196; 1942. Lens; Photographic, 12-In., F/2.5.

U. S. Gov., U. S. Army, Army Air Corps. Specification 75-197; 1942. Lens; Photographic, 7-In., F/2.5.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-212; 1942. Lens; Photographic, 6 3/8-In., F/4.5.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-213; 1942. Lens; Photographic, 13 1/2-In., F/3.5.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-214; 1942. Lens; Photographic, 20-In., Telephoto.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-216; 1942. Lens; Photographic, 40-In., Telephoto.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-217; 1942. Lens; Photographic, 3 1/4-In., F/5.5.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-222-A; 1944. Lens Cone; 6, 12, 24, 40, and 48-In. (for Type K-22 Camera).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-230; 1943. Lens Cone; Aircraft Camera, 7, 12, and 20-In., for Type K-24 Cameras.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-232; 1943. Control; Diaphragm Actuating, Type A-1, 6-In., F/6.3 Lens Cone.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-233; 1943. Control; Diaphragm Actuating, Type A-3, 24-In., F/6.0 Lens Cone.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-236; 1943. Control; Diaphragm Actuating, Type A-2, 12-In., F/5.0 Lens Cone.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-240; 1943. Lens Cone; Aircraft, Camera, 6 3/8-In., for Type K-24 Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-248; 1943. Lens Assembly (Gun Camera, 35-Mm. Lens, F/3.5 Aperture—90 Degree Erecting System).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-273; 1943. Shutter and Lens Assembly; 12-In., F/7.0 Lens.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-278; 1943. Shutter and Lens Assembly; 6 1/4-In., F/9.5 Lens.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-289; 1943. Lens; Photographic, Charting and Reconnaissance, 12-In., F/6.3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-352-A; 1944. Lens; Photographic, 40-In., F/5 Telephoto.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-361; 1944. Lens Assembly; "AN" Gun Camera, 16-Mm., 25-Mm., E.F.L. Lens F/3.5 Aperture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-370; 1944. Lens; Photographic, 40-In., F/5.6 Telephoto.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-150B; 1944. Lenses; Photographic, General Specification for.

911.9 MISCELLANEOUS PHOTOGRAPHIC GOODS

American Standards Assn., Z52.21-1944. Acceptance of Photographic Exposure Meters (Reflected-Light, Photoelectric Type) (American War Standard). Gives definition of acceptance, minimum acceptance, and determination of acceptance.

American Standards Assn., Z52.22-1944. Calibration of Photographic Exposure Meters (Reflected-Light, Photoelectric Type) (American War Standard). Gives calibration and uniformity of screen brightness.

American Standards Assn., Z52.30-1944. Abuse-Testing Mechanism for Photographic Exposure Meters (American War Standard). Gives scope and purpose, general design, theory of operation, use, construction, mounting and care of mechanism, and drawings.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.7.10-1944. Specifications for Contact Printers. Gives scope and purpose, size accommodation, aperture angles, illumination, contact, and temperature.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.7.11-1944. Specifications for Printing Frames. Gives size accommodation, aperture angles, and contact.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.7.12-1944. Specifications for Masks (Separate) for Use in Photographic Contact Printing. Gives aperture angles, light control, size, and thickness.

U. S. Gov., Army Air Forces. Specification No. 17005; 1937. Mount; Photographic.

U. S. Gov., Army Air Forces. Specification 24767 (1); 1943. Recorder; Film Identification (for Use With Type A-4 Aircraft Cameras).

U. S. Gov., Army Air Forces. Specification 24792; 1942. Equipment; Torpedo Training, Camera Assessing.

U. S. Gov., Army Air Forces. Specification 24885 (2): 1944. Kit; Film Assessing, Type W-1.

U. S. Gov., Army Air Forces. Specification No. 24900; 1944. Pictures; Three Dimension (Stereoscopic).

U. S. Gov., Army Air Forces. Specification 24906A; 1944. Photoplate; Bombing Trainer.

U. S. Gov., Army Air Forces. Specification 24952-A; 1945. Kit; Film Assessing, Type W-2.

U. S. Gov., Army Air Forces. Specification 31012-B; 1943. Background; Studio, Portable.

U. S. Gov., Army Air Forces. Specification No. 31167; 1941. Mask; Border, Photographic (for Type A-1A Contact Printer).

U. S. Gov., Army Air Forces. Specification No. 31205: 1942. Developer and Dryer; Continuous Duty; Type L-1 (Photo Paper).

U. S. Gov., Army Air Forces. Specification No. 31206; 1942. Developer and Dryer; Photographic Film, Type M-1 (Continuous Duty).

U. S. Gov., Army Air Forces. Specification No. 31268; 1942. Dryer; Film, Type A9 (Collapsible, 35-Mm. Film).

U. S. Gov., Army Air Forces. Specification 31283-1; 1944. Printer; Continuous Contact, Type C-1, Photographic.

U. S. Gov., Army Air Forces. Specification 31324-A; 1944. Timer; Photographic, Type C-1A (Automatic Interval).

U. S. Gov., Army Air Forces. Specification 31342-A; 1944. Machine; Photographic Negative Identification Stamping, Type A-3.

U. S. Gov., Army Air Forces. Specification 31350-1; 1944. Kit; Photographic Processing, Type N-3, Negative Marking.

U. S. Gov., Army Air Forces. Specification 31352-2; 1944. Kit; Darkroom Photographic, Type U-2, Portable by Air.

U. S. Gov., Army Air Forces. Specification No. 31361; 1944. Powders; Bleaching and Clearing, Film Reversal (for Photographic Use).

U. S. Gov., Army Air Forces. Specification No. 31363; 1944. Viewer; Continuous-Strip Stereo (Prints and Transparencies).

U. S. Gov., Army Air Forces. Specification 31365-1; 1945. Kit; Field Processing, Type N-6, Print Washing—Photographic.

U. S. Gov., Army Air Forces. Specification, 31367-1; 1945. Kit; Photographic Processing, Type N-8 (Contact Printing).

U. S. Gov., Army Air Forces. Specification 31368-1; 1944. Kit; Photographic Processing, Type N-9, Refrigerated Water Bath.

U. S. Gov., Army Air Forces. Specification No. 31375; 1944. Binder; Slide 2- by 2-In. (35-Mm. Film).

U. S. Gov., Army Air Forces. Specification No. 31379; 1944. Easel; Photographic Roll Paper.

U. S. Gov., Army Air Forces. Specification No. 31381; 1944. Dryer; Film, Type A-12, for Collapsible Motion Picture Film.

U. S. Gov., Army Air Forces. Specification No. 31382; 1944. Splicer; Positive Film, for 35-Mm. Motion Picture Film.

U. S. Gov., Army Air Forces. Specification No. 31385; 1945. Developer; Test-Strip Film, Type N-1 (35-Mm. Motion Picture).

U. S. Gov., Army Air Forces. Specification 31388-1; 1945. Developer; Film, Type K-3 (Photographic).

U. S. Gov., Federal Specification RR-T-646; 1933. Amendment 1; 1944. Trays; Photographic, Enameled. Covers one grade. Gives requirements for material, workmanship, dimensions, tolerances, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-P-55; 1944. Prints; Release, Motion Picture, 16-Mm. American Standards Assn., Z52.3-1944.

U. S. Gov., Joint Army-Navy Specification JAN-M-58; 1944. Meters; Photographic Exposure (Reflected Light, Photoelectric Type).

U. S. Gov., Treasury Dept., Procurement Div., 599a; 1944. Opaquing-Compound; Photographic-Negatives. Covers type I—liquid and type II—paste. Intended for the correction of photographic negatives. Gives requirements for consistency and working properties, opaquing, drying, dilution, stability on standing, stability to evaporation, and stability to heat; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 631; 1943. Paraformaldehyde; Technical Grade. Shall be in one type and one grade in powdered form free from hard lumps and foreign particles. Intended for use in photographic processes. Gives requirements for paraformaldehyde content, ash, acidity, solubility, and particle size; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 633; 1943. Developer; Photographic, X-Ray Film, Powder. Shall be one type and one grade in powder or crystalline form consisting of a developer proper and of a separate reducing agent. Intended for use in the developing of standard medical X-ray film. Gives requirements for solubility and developing properties; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 658; 1944. Collodion; Plain (for Wet Plate Photography). Covers one type and one grade of clear liquid. Gives requirements for appearance, color, nonvolatile matter, drying time, viscosity, and dilution test; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 667; 1944. Thinner; Collodion (for Wet Plate Photography). Covers one type and one grade. Gives requirements for color, specific gravity, distillation range, nonvolatile matter, odor, and spot test; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 669; 1944. Fixer; Photographic, X-Ray Film, Powder. Covers one type and one grade in powder or crystalline form consisting of a unit made up of a fixer and of a separate hardener. Gives requirements for solubility, fixing properties, hardening properties, sulfurization life at 120° F., and developer capacity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 676a; 1944. Fixer; Photocopying-Machines, Powder. Covers one type and one grade in powder or crystalline form. Gives requirements for solubility, fixing properties, hardening properties, sulfurization life, and developer capacity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 679a; 1944. Developer; Photocopying-Machines, Powder. Covers one grade and two types—(I) daylight development and (II) dark development. Shall be in powder or crystalline form consisting of developer proper and a reducing agent. Gives requirements for solubility and developing properties; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept. Procurement Div., No. 693; 1944. Adhesive Coating; Temporary, Ready-Mixed (for Use With Photographic Film). Covers one grade and two types—(I) clear and (II) translucent (matte). Gives requirements for nonvolatile content, viscosity, set to touch, accelerated aging, performance, and settling test; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 707; 1944. Fixer; Photographic (Film, Liquid, High-Speed). Covers one type and one grade of a liquid form consisting of a fixer and separate hardener. Gives requirements for miscibility, fixing properties, hardening properties, sulfurization life at 120° F., and developer capacity; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-30A; 1930. Table; Film, Plotting, Type A-1, and Packing Case.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-31; 1930. Printer; Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-33; 1930. Printer, Photographic, Type A-1A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-34; 1930. Printer; Projection, Type B-3, Resistutional.

U. S. Gov., U. S. Army, Army Air Forces. Specification 91-61B; 1940. Laboratory; Photographic, Portable, Type A-1A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-64; 1940. Straightener; Photographic Print, Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-66; 1940. Dryer; Aerial Roll Film; Type A-3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-69A; 1943. Washer; Photographic Print, Type A-1A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-71; 1940. Wringer; Print, Photographic, Motor Driven, Type A-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-96; 1941. Holder; Photographic, Film and Paper, Type A-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-98; 1941. Album; Photoprint, Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-99; 1941. Washer; Print, Type A-3, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-127; 1941. Album; Photoprint, Type A-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-130; 1941. Printer; Contact, Type A-7.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-131; 1941. Dryer; Photoprint, Type B-4A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-132; 1941. Indicator; Mosaic-Map Control Point, Type A-1.

U. S. Gov., U. S. Army, Army Air Corps. Specification 75-136A; 1944. Printer; Contact, Type A-8 (Portable).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-138-A; 1943. Table; Film Plotting, Type A-2A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-139; 1941. Dryer; Photographic Print, Type B-7.

U. S. Gov., U. S. Army, Army, Air Forces. Specification 75-140; 1941. Press; Photographic, Dry Mounting, Type A-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-142A; 1944. Developer; Film, Type E-3, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-143; 1941. Developer; Film, Type B-4, Portable.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-147; 1941. Dryer; Aerial, Roll Film, Type A-5.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-151; 1941. Straightener; Photographic Print, Type A-1a;

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-155; 1941. Dryer; Film, Photographic, Type A-6.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-156; 1941. Laboratory; Photographic, Type A-2, Portable.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-200; 1942. Developer; Film, Type B-5, Portable.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-201; 1942. Washer; Photographic Print, Type A-2A.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-205; 1943. Developer; Film, Type K-1a, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-219A; 1943. printer; Contact, Type A-11.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-220; 1942. Kit; Interperter's Photo, Type F-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-224; 1943. Kit; Interpreter's Photo, Type F-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-226; 1943. Laboratory; Photographic, Type F-1, Portable by Air.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-228; 1943. Dryer; Photographic, Print, Type B-8.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-235; 1943. Switch; Selector, Diaphragm, Actuating, Type A-1, Manually Operated.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-237; 1943. Printer; Projection, Automatic, Type B-12, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-244; 1943. Developer; Film, Type G-3, 16- and 35-Mm. Film.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-247; 1943. Dryer; Aerial Roll Film, Type A-10.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-249; 1943. Laboratory; Portable, Type F-3, Portable by Air.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-252; 1943. Washer; Print, Type A-4, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-253; 1943. Printer; Contact, Type A-10.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-254A; 1944. Safelight; Plastic, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-255; 1943. Laboratory; Photographic, Demountable, Type E-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-256; 1943. Editor; Film, 16-Mm., Motion Picture.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-257; 1943. Safelight; Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-259; 1943. Dryer; Film, Photographic, Type A-8, 16-Mm., Manually Operated.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-262; 1943. Hangar; Photographic, Film Processing.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-263; 1943. Dryer; Aerial Roll Film, Type A-7.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-266; 1943. Album; Photographic, Type A-3, Loose-Leaf.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-274; 1943. Plate; Ferrotype, for Photographic Use.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-276; 1943. Trimmer; Photographic Print, Wood.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-292; 1943. Holder; Cut Film, 8 by 10 In.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-293; 1943. Holder; Cut Film, 4 by 5 In.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-347; 1943. Developer; Roll Film, Type D-3 Portable, Quick Work.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-348; 1943. Printer; Contact, Type C-3 (Continuous).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-351; 1943. Finder; Height, Type C-1, Photo Interpreter's.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-353; 1944. Trimmer; Paper and Photographic Print.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-358; 1944. Kit; Photographic Copying and Enlarging, Type P-1, Airborne.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-359; 1944. Splicer; Aerial Roll Film, Type A-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-365; 1944. Trimmer; Photographic Print, Type A-2, Hand Operated.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-368; 1944. Easel; Photographic Retouching, 8 by 10 Negative.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-369; 1944. Kit; Photographic Darkroom, Type U-1, Portable by Air.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-371; 1944. Dryer; Photographic Glossy Print, Type B-10.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-381; 1944. Pack; Portable Photographic Power.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-383; 1944. Kit; Photographic Processing and Printing, Type N-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-389; 1944. Kit; Photographic, Water Supply, Type O-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-420; 1944. Kit; Photographic, Water Supply, Type O-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-463; 1944. Medium; Transparent, Photographic.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-464; 1944. Medium; Photographic Masking, Red Cellulose Nitrate Base.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-465; 1944. Dryer; Photographic Print, Type B-11.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1042B-1944. Powder; Developer, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1043B; 1944. Powder; Fixer, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2700; 1939. Chimney, for Dark Room.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-3; 1923. Timer; Type PH-29, Photographic.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-5; 1923. Celluloid; Ruby, 5 by 7 In. Sheet, Dark Room.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-27; 1928. Rack; Developing, for Motion Picture Films.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-36B; 1938. Projector Equipment, Type PH-40; Developing Equipment, Type PH-41; Drying Rack, Type PH-42.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-44-A; 1940. Motion Picture Film Developing Machine.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-47B; 1939. Emulsion; Light Sensitive, for Motion Picture Film.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-48; 1939. Printer; Motion Picture.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-49; 1939. Printer; Reduction, Motion Picture.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-67; 1941. Sound Recorder for Motion Picture Film.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-81; 1941. Time Interval Device, Type PH-103.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-82; 1942. Film Viewer, PH-97-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 75-105A; 1944. Bag BG-140 and Associated Equipment (Lightproof Operating).

U. S. Gov., U. S. Army, Signal Corps. Specification 75-186; 1942. Recorder PH-271; Sound Motion Picture.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-21c; 1942. Developing Powder.

References.—Metol, *see* 809.3; sodium carbonate for photographic purposes, *see* 834.4; anhydrous sodium sulphate for photography, *see* 834.9; preservers or storage enevelopes for negatives, *see* 494.

912. PROJECTION APPARATUS

American Society of Mechanical Engineers. American Standards Assn., Z 15.1-1932. Engineering and Scientific Charts for Lantern Slides. A valuable set of rules for drawing the original charts and for their reproduction as lantern slides. Standard also specifies types and sizes of lettering, different line widths, and sizes of symbols commonly used in graphs. An appendix contains a table of commercial lettering templates and lettering pens with which charts may be easily reproduced in the manner recommended.

American Standards Assn., Z52.4-1944. Method of Determining Freedom From Travel Ghost in 16-Mm. Sound Motion Picture Projectors (American War Standard). Gives scope and purpose, definition, test film, test method, and figure showing typical test pattern.

American Standards Assn., Z52.5-1944. Method of Determining Resolving Power of 16-Mm. Motion Picture Projector Lenses (American War Standard). Gives scope and purpose, test method, test projector, test object, and figures showing resolution test patterns, resolving power test object, and identification of test patterns in frame area.

American Standards Assn., Z52.6-1944. Method of Determining Picture Unsteadiness of 16-Mm. Sound Motion Picture Projectors (American War Standard). Gives scope and purpose, test film, test method, and expression of picture unsteadiness.

American Standards Assn., Z52.7-1944. Method of Determining Uniformity of Scanning Beam Illumination of 16-Mm. Sound Motion Picture Projectors (American War Standard). Gives scope and purpose, test method, and test films.

American Standards Assn., Z52.37-1944. Picture Projection Aperture of 35-Mm. Motion Picture Projectors (American War Standard). Gives drawing and table showing dimensions.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Motion Picture Projectors and Equipment. Requirements on inclosure of live parts, grounding, thickness of metal in arc light housing, minimum wire sizes, general construction of film magazines and automatic shutters, requirements for fireproof projector room, sizes of vent pipes and fans, storage and rewinding of films.

Optical Society of America. American Standards Assn., Z 38.7.5-1943. Methods of Testing Printing and Projection Equipment. Covers test for uniformity of contact between negative and positive in printing equipment, measurement of film or slide temperature, and measurement of the uniformity of illumination of the screen.

Optical Society of America, sponsor. American Standards Assn., Z38.7.9-1944. Proposed American Standard Specifications for Microfilm Readers. A microfilm reader is defined as a projection device for showing a readable image of a microfilm. Covers dimensions, lens, magnification, illumination, temperature, reels, and sprockets.

Society of Motion Picture Engineers. Recommended Procedure and Equipment Specifications for Educational 16-Mm. Projection, 1941. This is a report of the committee on nontechnical equipment and is in three parts: Part I is a general discussion of the problems that enter into the selection and use of 16-Mm. motion picture equipment for educational institutions. It includes recommendations for such comparative tests of equipment as can properly be made without testing laboratory facilities. Part II is a report on the optical characteristics of the screens available at the present time for nontheatrical projection. Part III consists of a set of detailed technical specifications defining acceptable performance of 16-Mm. projection equipment for educational uses. The character of these specifications is necessarily such that they can be interpreted and applied only by a fully equipped testing laboratory.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.4-1941. 35-Mm. Motion Picture Film, Projector Reels. Dimensional standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.6-1941. 16-Mm. Motion Picture Film, Projector Sprockets. Dimensional standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.8-1941. 16-Mm. Silent Motion Picture Film, Projector Aperture. Dimensional standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.10-1941. 16-Mm. Silent Motion Picture Film, Emulsion Position in Projector—Positive (for Direct Front Projection).

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.11-1941. 16-Mm. Motion Picture Film, Projection Reels. Dimensional standards

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.18-1941. 8-Mm. Motion Picture Film, 8-tooth Projector Sprockets. Dimensional standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.20-1941. 8-Mm. Silent Motion Picture Film, Projector Aperture. Dimensional standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.22-1941. 8-Mm. Silent Motion Picture Film, Emulsion Position in Projector—Positive (for Direct Front Projection).

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.23-1941. 8-Mm. Silent Motion Picture Film, Projection Reels. Dimensional standards.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.29-1941. Recommended Practice for Motion Picture Theater Projection Screens. Recommended sizes.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.30-1941. Recommended Practice for Motion Picture Engineering Nomenclature. Teeth in Contact.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.39-1944. Screen Brightness for 35-Mm. Motion Pictures. Gives requirement for brightness at center of screen when the projector is running with no film in the gate.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.7.4-1944. Specifications for Projectors for Opaque Materials for Use in Small Auditoriums. Gives size of aperture, focusing, lens, illumination, and temperature.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.7.13-1944. Dimensions for Lantern Slides. Gives size, thickness, projection portion, thumb mark, and other holders for standard lantern slides and standard miniature lantern slides.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z38.7.14-1944. Specifications for Lantern Slide Projectors. Gives uniformity of screen illumination, lenses, stray light, and slide temperature.

Society of Motion Picture Engineers, sponsor. American Standards Assn., Z22.35-1941. 35-Mm. Motion Picture Film, 16-Tooth Projector Sprockets. Dimensional standards.

U. S. Gov., Army Air Forces. Specification—24923 (1); 1944. Scoring Device (for Type E-14 Aerial Gunnery Trainer).

U. S. Gov., Army Air Forces. Specification 31006-D; 1943. Screen; Projection, Type A-2 (Beaded).

U. S. Gov., Army Air Forces. Specification 31158 (1); 1941. Screen; Portable Projection (Photographic).

U. S. Gov., Army Air Forces. Specification 31296; 1943. Screen; Projection, Type A-3 (3-Dimension Stereoscopic).

U. S. Gov., Army Air Forces. Specification 31343-1; 1943. Projector; 35-Mm. Slide Film, Type O-4 (Draft and Rate Bombing Trainer).

U. S. Gov., Army Air Forces. Specification 40726 (2); 1944. Trainer; Map Projection, Type O-51 (Globe).

U. S. Gov., Army Air Forces. Specification 40865-2; 1945. Trainer; General Purpose, Type R-2, Opaque Objects.

U. S. Gov., Army Air Forces. Specification No. 40890; 1944. Trainer; General Purpose, Type R-1 (Stereoscopic Viewer).

U. S. Gov., Federal Specification G-M-111; 1931. Mats; Lantern Slide. Covers on grade. Gives requirements for quality, size, openings, manufacture, stock, thickness, opacity, finish, and printing; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Joint Army-Navy Specification JAN-P-1944. Projection Equipment; Sound Motion Picture, 16-Mm., Class I.

U. S. Gov., Navy Dept. Specification 17M18a; 1944. Machine and Equipment; Sound Motion Pictures (35-Mm.), for shipboard use.

U. S. Gov., Navy Dept. Specification 17M19a; 1944. Machines and Equipment; Sound Motion Picture, 35-Mm.

U. S. Gov., Navy Dept. Specification 17 M 20; 1943. Machines and Equipment; Sound Motion Picture, 16-Mm.

U. S. Gov., Navy Dept. Specification 17P9a; 1944. Projectors; Opaque-Object, Strip-Films, and Slides.

U. S. Gov., Treasury Dept., Procurement Div., 429C; 1943. Projectors; Motion Picture, 16-Mm., Silent and Sound. Covers three types—(I) silent film projector, (II) silent and sound film projector, and (III) sound film projector, which shall be furnished in two classes—(A) 85 db above reference sound level and (B) 90 db above reference sound level. Gives requirements for housing, projection lamp and cooling system, illumination, optical system, enclosure, motor and speed regulation, controls and carrying case; methods of inspection and tests; and packing and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 612; 1943. Projection Screens and Accessories. Shall be suitable for suspension from wall, ceiling, tripods, or other suspension device. Gives requirements for glass beaded screen, backboard, screen housing, tripods, screen suspension device, metal, wood, sizes, and cover bag; methods of sampling, inspection, and tests; and packing and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-63A; 1940. Projector; Lantern Slide, Type B-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-73; 1940. Projector; Motion Picture, Sound Film, 35-Mm., Incandescent Lamp, Type A-3.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-74; 1940. Projector; Motion Picture, Sound Film, 35-Mm., Arc Lamp, Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-141-A; 1944. Projector; Motion Picture, Type D-1B (16-Mm.).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-225; 1942. Projector; 35-Mm., Type C-3, Bomb Spotting.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-264A; 1943. Printer; projection, Type B-11.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-267-A; 1944. Projector; Type C-2, (35-Mm., Still Film and Slide).

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-298; 1944. Background; Portable Unitary Studio.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-299; 1944. Daylight Projection Box.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-356; 1944. Glass; Lantern Slide Cover.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-387; 1944. Projector; Type B-2 (Lantern Slide, Opaque Objects, and Film Strip).

U. S. Gov., U. S. Army, Signal Corps. Specification 75-36B; 1938. Projector Equipment, Type PH-40; Developing Equipment, Type PH-41; Drying Rack, Type PH-42.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-45C; 1940. Motion Picture Film—Projecting Machine, 16-Mm.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-79; 1942. Projection Equipment; Motion Picture, 35-Mm., Sound on Film.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-83; 1942. Projector; PH-331, Motion Picture.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-91; 1942. Douser; PH-357, Motion Picture Projector.

References.—Booths for projectors, *see* 518.54; storage of motion picture films, *see* 518.50; sound recording and reproducing equipment, *see* 718.7; testing of lenses, *see* 914.0; motion picture films, *see* 911.2; lantern slide charts, *see* 482.

914. OPTICAL GOODS

914.0 GENERAL ITEMS

American Standards Assn., Z 44-1942, War Standard Specification and Description of Color. To recognize and recommend a basic method for the specification of color, and to facilitate its popular interpretation. The spectrophotometer shall be recognized as the basic instrument in the fundamental standardization of color.

National Conservation Bureau, No. 322, Goggles Versus Glass Eyes. An article describing the value of safety goggles in preventing industrial accidents. Covers: Glass Eyes Don't See, Laying Down the Law, What, No Glamour?, Import Supply Curtailed, and Dividends Guaranteed.

914.1 LENSES (NOT FITTED TO INSTRUMENTS)

U. S. Gov., Army Air Forces. Specification No. 3228; 1944. Lens; Electrically Heated.

U. S. Gov., Army-Navy Aeronautical Specification AN-DD-L-236-1; 1944. Lenses; Goggle, Flying.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS78-40; 1940. Ground-and-Polished Lenses for Sun Glasses. This commercial standard covers the accuracy of grinding and polishing, as well as freedom from defects that impair serviceability of ground-and-polished sun-glass lenses of curved and flat types made entirely of glass. The lenses covered by this commercial standard are eye-protective (not eye-corrective) devices. They are not a substitute for prescription lenses but may be worn therewith. Sponsored by Sun Glass Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS79-40; 1940. Blown, Drawn, and Dropped Lenses for Sun Glasses. This commercial standard covers workmanship, dimensional precision, and freedom from defects that impair serviceability of blown, drawn, and dropped sun-glass lenses. The lenses covered by this commercial standard are eye-protective (not eye-corrective) devices. They are not a substitute for prescription lenses but may be worn therewith. It covers blown-glass lenses of the micoquille type, drawn-glass lenses of the flat type, and blown or dropped lenses of the coquille type. Sponsored by Sun Glass Institute.

U. S. Gov., Treasury Dept., Procurement Div., No. 650; 1944. Magnifiers and Magnifying Glasses. Covers four types—(I) reading glasses—class A, round and class B, rectangular; (II) folding pocket magnifiers—class A, one lens, class B, two lenses, and class C, three lenses; (III) watchmaker's loupes; and (IV) linen testers. Gives requirements for glass, plastics, metal parts, workmanship, lenses, focus and magnifying power, tolerance, finish, identification, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2287A; 1944. Case; Trial Lenses.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2874A; 1944. Case; Trial Lenses. Pocket Set.

References.—Railway signal lenses, automobile headlamp lenses, *see* 525.3, 525.4.

914.2 BINOCULARS AND TELESCOPES

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-41. Binoculars.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-511. Binoculars; Prismatic—8 x 10, With Carrying Case.

U. S. Gov., Marine Corps Specification, revised 1943. Glass; Field, 6 x 30 Power, Independent Focus.

U. S. Gov., Marine Corps Specification, adopted 1937. Telescope.

U. S. Gov., Navy Dept. Specification 18B2c; 1934. Binoculars; Prismatic, 6 by 30 Power.

U. S. Gov., Navy Dept. Specification 18B4a; 1930. Binoculars; Prismatic, 7 by 50 Power.

U. S. Gov., Navy Dept. Specification 18T10a; 1930. Telescopes; Ship, With Stands.

U. S. Gov., Navy Dept. Specification 57L9; 1941. Loupes; Binocular (Beebe Type).

References.—Standard tests and methods of testing, *see* 914.0.

914.3 MICROSCOPES

American Hospital Assn., 43-34. Miscroscope Slides. Covers one type, one grade, and three classes.

U. S. Gov., Federal Specification GG-S-446; 1940. Admendment 1; 1942. Slides; Glass (for Microscopy). Covers four types—(I) plain, (II) concave (Microculture), (III) dark field, and (IV) frosted end. Gives requirements for dimensions, color, sizes, and thicknesses; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2050C; 1941. Microscope; Dark Field Apparatus.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2254A; 1941. Microscope; Stage, Micrometer.

914.4 READING GLASSES

U. S. Gov., Navy Dept. Specification 18G9; 1944. Glasses; Magnifying, Reading.

U. S. Gov., Treasury Dept., Procurement Div., No. 650; 1944. Magnifiers and Magnifying Glasses. Covers four types—(I) reading glasses—class A, round and class B, rectangular; (II) folding pocket magnifiers—class A, one lens, class B, two lenses, and class C, three lenses; (III) watchmaker's loupes; and (IV) linen testers. Gives requirements for glass, plastics, metal parts, workmanship, lenses, focus and magnifying power, tolerance, finish, identification, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2502; 1939. Magnifier; Folding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2706; 1939. Glass; Reading, Magnifying.

References.—Standard tests and methods of testing, *see* 914.0.

914.5 EYE AND FACE SHIELDS AND GOGGLES

Industrial Safety Equipment Assn. Proposed Standard Optical Specifications for Lenses, Plates, and Covers for Industrial Eye-Protective Devices, 1942. The purpose of this specification is to guarantee satisfactory optical performance in all types of industrial eye-protective devices such as chipper's goggles, welder's goggles, welder's helmets, welder's hand-shields, etc. Covers definitions, requirements, inspection methods, and table giving shades intended for various types of work.

U. S. Gov., Army Air Forces. Specification 3200-3; 1945. Goggle; Flying, Type B-8.

U. S. Gov., Army Air Forces. Specification No. 3207; 1944. Goggles; Contrast, Type G-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-119; 1944. Cushions; Goggle, Flying.

U. S. Gov., Army-Navy Aeronautical Specification AN-F-37; 1944. Frames; Flying Goggle.

U. S. Gov., Army-Navy Aeronautical Specification AN-G-22; 1944. Glasses; Flying Sun.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-155. Goggles; Glare-Reducing.

U. S. Gov., Dept. of Agriculture. Forest Service. Specification No. 156. Goggles; Horse.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H24; 1938. American Standards Assn., Z2-1938. Standard Safety Code for the Protection of the Heads, Eyes, and Respiratory Organs. Protectors for chipping, riveting, calking; scaling, grinding; exposure to dust and wind; babbitting; handling corrosive chemicals, dipping, brush coating; exposure to glare; oxyacetylene welding, furnace work; arc welding and cutting; exposure to dust fumes, mist, smokes, or other atmospheric particulate matter; abrasive blasting; exposure to irrespirable gases and vapors; and exposures to heavy falling objects. Operating rules and tests for protectors.

U. S. Gov., Federal Specification GG-S-328; 1943. Shields; Eye, Single. Covers one type, one shape, one size, and one grade. Gives requirements for material, workmanship, shield, covering, and tying tapes; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-G-501b; 1944. Amendment 1; 1944. Goggles; Eyecup, Protective, Impact-Resisting, Chippers', Grinders', etc. Covers curved and flat lenses. Gives requirements for material, workmanship, marking of eyecups and lenses, bid samples, eyecups, lens seat, lens-retaining ring, lenses, nose bridges, and headbands; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-G-511a; 1944. Goggles; Eyecup Protective (Welders). Gives requirements for materials, workmanship, tests, marking of eyecups and filter lenses, bid samples, eyecups, filter lens and cover lens retaining ring, filter lenses, transmissions and tolerances in transmission of various shades of glasses, cover lenses, nose bridge, and headbands; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GGG-G-521; 1933. Amendment 1; 1935. Goggles; Rubber-Frame. Covers the single piece, flexible, rubber-frame type. Gives requirements for design and construction, goggle frame, headband, ventilation and contact, rubber compound, and lenses; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 37G7d; 1942. Goggles; Spectacle Type, for Protection Against Flying Particles and Chips.

U. S. Gov., Navy Dept. Specification 37G11b; 1942. Goggles; Cover.

U. S. Gov., Navy Dept. Specification 37G13; 1939. Goggles; Combustion.

U. S. Gov., Navy Dept. Specification 37G16; 1942. Goggles (Frames and Lenses), Protective (Glare and Welders').

U. S. Gov., Navy Dept. Specification 37G17; 1942. Goggles; Eyecup, Chippers'.

U. S. Gov., Navy Dept. Specification 37G18; 1943. Goggles; Variable-Density (Lookout).

U. S. Gov., Navy Dept. Specification 37M7a; 1942. Masks; Face, Wool-Felt (Special Winter Clothing).

U. S. Gov., Navy Dept. Specification 49M1; 1926. Masks; Aviators', Face, Leather.

U. S. Gov., Treasury Dept., Procurement Div., No. 620; 1943. Shields; Face, Plastic. Covers two types—(I) without crown protector and (II) with crown protector; and two styles—(A) clear transparent visor and (B) shaded transparent visor. Gives requirements for sizes, visor length, visor thickness, material, workmanship, general design, visor optical properties, visor temperature and moisture resistance, flammability, face clearance, visor construction, headgear, crown protector, weight, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2404A; 1941. Spectacles; Ultraviolet, Patients', Protective.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2407A; 1941. Goggles; Operators', for Fluoroscopy and Heliotherapy, Protective.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2608; 1939. Shade; Eye.

U. S. Gov., U. S. Army, Transportation Corps. Specification 43-12; 1929. Goggles; Railroad.

References.—Gas masks, *see* 993; oxygen breathing apparatus, *see* 993; methods of testing rubber goods, *see* 200; methods of analysis and standard samples of glass, *see* 520.

914.6 LOVIBOND GLASSES

914.9 MISCELLANEOUS OPTICAL GOODS

U. S. Gov., Army Air Forces. Specification No. 40882; 1944. Trainer; Demonstrator, Type Q-22, Night Vision.

U. S. Gov., Navy Dept. Specification 18S17a; 1944. Spectacles; Smoked-Glass.

U. S. Gov., U. S. Army, Army Air Forces. Specification 42-65; 1944. Stereoscope; Magnifying, Mirror, W/Binoculars and Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-25; 1936. Stereoscope; Magnifying, Lens, Prism.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 51-70-4B; 1944. Films; Reflection-Reducing, for Glass Optical Elements.

References.—Marine sextants, *see* 916.22.

915. DENTAL, SURGICAL, AND MEDICINAL EQUIPMENT AND SUPPLIES

915.0 GENERAL ITEMS

American College of Surgeons. Manual of Hospital Standardization and Approved Lists of Hospitals, 1944. Minimum requirements as to equipment and provision of a staff, eligibility to staff, staff rules for hospital, complete records, diagnostic and therapeutic facilities.

American Medical Assn. Council on Industrial Health. Medical Service in Industry, 1941. Gives a check list of equipment for a small plant dispensary including general furnishings, instruments and supplies, and physical examination equipment.

American Medical Assn. Council on Industrial Health. Standing Orders for Nurses in Industry, 1943. Gives a list of furnishings and supplies for nurses in industry including general furnishings, instruments and supplies, and drugs.

American Public Health Assn. The Control of Communicable Diseases, Sixth Edition, 1945. An informative text on communicable diseases. Gives definitions and gives a summary of each communicable disease including recognition of the disease, etiologic agent, source of infection, mode of transmission, incubation period, period of communicability, susceptibility and immunity, prevalence, and methods of control.

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Div., Medical and Surgical Section. Circular M. and S.-216; 1939. Recommended Physical Standards for Railroad Employes. Covers regulations and requirements governing physical examinations (including sight, color sense, and hearing tests) for entrance to service, promotion, periodic and special examinations, with method of conduction.

U. S. Gov., Navy Dept. Specification 51M4b; 1941. Medicinal Products, Clinical Laboratory Reagents and Containers.

915.1 DENTAL EQUIPMENT AND SUPPLIES

915.10 General Items

American Dental Assn. Accepted Dental Remedies, 1944. The Council on Dental Therapeutics, which is a standing committee of the American Dental Assn., was organized in January 1930. Since its founding, it has given consideration to thousands of dental products of which approximately 600 are currently accepted and are described in this book.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R108-44; 1944. Dental Hypodermic Needles. This recommendation establishes a simplified list of stock sizes of dental hypodermic needles. Gives table showing various kinds, wire gage, length, and material.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R116-30; 1930. Dental Brush Wheels. This recommendation establishes a simplified schedule for stock varieties of dental brush wheels made of straight bristles, converging bristles, and cup-shape bristles. Sponsored by the American Dental Trade Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R117-30; 1930. Packaging of Dental Plaster, Investment and Artificial Stone. This recommendation establishes a simplified schedule for packaging of dental plaster, investment and artifical stone. Sponsored by the American Dental Trade Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R130-32; 1932. Dental Lathe Grinding Wheels. This recommendation establishes a simplified list of stock varieties of dental lathe grinding wheels having diameters from 1 1/2 to 3 in. Sponsored by American Dental Trade Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R137-32; 1932. Dental Cone-Socket Mirrors. This recommendation establishes a simplified schedule of four diameters for cone-socket mirrors for regular stock purposes. Sponsored by the American Dental Trade Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R195-42; 1942. Dental Excavating Burs. Reduces the standard bur members from approximately 75 to 18. Proposed by the Health Supplies Branch, War Production Board.

U. S. Gov., Federal Specification AA-C-326; 1934. Amendment 1; 1939. Chairs; Operating, Dental, Motorless. Covers one type and one grade. Gives requirements for base, elevator mechanism, speed regulator, rotating mechanism, operating levers, metal castings, seat and back, arm rests, head rest, foot platform and toe plate, and finish; methods of inspection, tests; and requirements for packing and marking.

915.11 Dental Instruments

U. S. Gov., Federal Specification GG-H-577; 1944. Holders; Nerve Broach, Dental. Covers one grade, one class, and two types—(I) four-jaw and (II) two-jaw. Gives requirements for material, workmanship, dimensions, corrosion-resistance, stamping, and physical and mechanical requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-I-526; 1943. Instruments; Dental and Surgical; General Specifications. Covers five grades—(1) carbon steel, (2) corrosion-resisting steel, (3) cobalt-chromium-tungsten alloy, (4) miscellaneous, and (5) unclassified. Gives detail requirements as to dimensions, style and design, construction, methods of sampling, inspection and tests, and packaging and packing.

U. S. Gov., Navy Dept. Specification 57D4; 1941. Disks; Polishing, Rubber (Impregnated), Assorted (Dental).

U. S. Gov., Navy Dept. Specification 57N7; 1944. Nozzles; Metal, for Syringe, Chip (Dental).

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2129A; 1939. Forceps; Tooth Extracting.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2130A; 1941. Scissors; Surgical and Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2384A; 1941. Knife; Finishing.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2426B; 1940. Elevator; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2427; 1934. Cutter; Ligature, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2428A; 1940. Carvers; Amalgam.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2433B; 1941. Excavator; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2439A; 1940. Chisel; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2440A; 1940. Plugger; Plastic, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2450A; 1940. File; Finishing, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2455; 1938. Finisher; Vulcanite, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2457A; 1940. Curette; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2475; 1939. File, for Gold.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2476; 1939. Forceps; Rubber Dam, Punch.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2540; 1939. Burr; Dental, Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2544; 1939. Screw-Driver; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2581; 1939. Carrier; Amalgam.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2582; 1939. Dentimeter.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2583B; 1944. Explorers; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2584A; 1940. Forceps; Bone, Rongeur, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2585; 1939. Holder; Nerve Broach.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2586; 1939. Knife; Gum, Resecting.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2587A; 1940. Lancet; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2588A; 1940. Pliers; Dental, Prosthetic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2595; 1939. Plugger; Plastic, No.39.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2596A; 1941. Scaler.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2603; 1939. Crown Remover; Simplex.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2617; 1939. Hammer; Riveting, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2619; 1939. Saw; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2630; 1939. Forceps; Crown Slitting.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2634; 1939. Separator; Elliott.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2635; 1939. Tweezer; Soldering.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2648; 1939. Blade; Float, Dental, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2651; 1939. Punch; Dental, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2656; 1939. File; Bone, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2657; 1939. Tongs; Flask and Soldering.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2664; 1939. Frame; Saw, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2677; 1939. Crown and Splint Remover.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2708; 1939. Instrument; Gum Resecting, Ward.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2769; 1939. Puller; Post, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2818A; 1940. Plugger; Root Canal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2862A; 1940. Point; Carborundum, Mounted, for Dental Handpiece.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2868; 1939. Point; Root Canal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2881; 1939. Forceps; Wolf-Tooth, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2883; 1939. Cutter, Extractor, and Universal Handle; Molar, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2889; 1939. Reamer, Root Canal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2907; 1939. File; Root Canal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2938; 1939. Burr; Dental, Excavating.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2939; 1939. Burr; Dental, Plug, Finishing and Vulcanite.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2940; 1939. Mandrels; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2951; 1939. Pick; Dental, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2960; 1939. Burnisher; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2961; 1939. Plugger; Amalgam.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2963; 1939. Trimmer; Vulcanite, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2968; 1940. Chisel; Osseous, Dental.

References.—Standard sizes and grades, *see* 915.10.

915.12 Dental Alloys

American Dental Assn. Specification No. 1; 1934. Dental Amalgam Alloy. Technical requirements are similar to those of U. S. Gov., Federal Specification U-A-451a, Alloy; Dental, Amalgam.

U. S. Gov., Federal Specification U-A-451a; 1937. Alloy; Dental, Amalgam. Covers two types—(A) shavings and (B) filings. Gives requirements for chemical composition, flow and setting changes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2602; 1939. Amalgam; Copper.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2618; 1939. Metal; Fusible, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2867; 1939. Flux; Reducing, for Gold Alloys, Dental.

References.—Dental gold alloys, *see* 662; dental amalgam alloys, *see* 691.1.

915.13 Dental Rubber Goods

U. S. Gov., Navy Dept. Specification 57B23; 1941. Bands; Rubber, Ligature, Dental.

References.—Rubber dam, *see* 204.4.

915.14 Dental Films

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2740A; 1940. Carrier; Dental Films.

915.19 Miscellaneous Dental Supplies

American Dental Assn. Specification No.2; 1930. Inlay Casting Investment. Technical requirements are similar to those of U. S. Gov., Federal Specification U-I-546, Investment; Casting, Inlay, Dental.

American Dental Assn. Specification No.3; 1940. Impression Compounds. Technical requirements are similar to those of U. S. Gov., Federal Specification U-M-506, Modeling-Compound; Dental.

American Dental Assn. Specification No.4; 1940. Inlay Casting Wax. Technical requirements are similar to those of U. S. Gov., Federal Specification U-W-141, Wax; Casting, Inlay, Dental.

American Dental Assn. Specification No.8; 1938. Zinc Phosphate Cement. Technical requirements are similar to those of U. S. Gov., Federal Specification U-C-211, Cement; Zinc-Phosphate, Dental.

American Dental Assn. Specification No.9; 1938. Silicate Cement. Covers material, general requirements, detail requirements, methods of inspection and test, time of setting, ultimate compressive strength, opacity, solubility and disintegration, arsenic content, and packaging.

American Dental Assn. Specification No.11; 1940. Hydrocolloidal Impression Material. Technical requirements are similar to those of U. S. Gov., Federal Specification U-I-496, Impression-Material; Hydrocolloidal, Dental.

American Dental Assn. Specification No. 12; 1941. Acrylic Resin. Technical requirements are similar to those of U. S. Gov., Federal Specification U-D-226, Denture-Base Material, Acrylic Resin or Mixtures of Acrylic and Other Resins.

American Society for Testing Materials, C 72-40; 1940. American Standards Assn., A 65.1-1941. Calcined Gypsum for Dental Plasters. Covers three grades—(Q) quick setting, (M) medium setting, and (S) slow setting. Gives requirements for composition, time of setting, tensile strength, fineness, sampling, laboratory samples; methods of testing, packing and marking; inspection, rejection, and rehearing.

U. S. Gov., Federal Specification U-C-205; 1943. Cement; silicate, Powder; and Accessories (Dental). Silicate cement shall be of but one type, grade, and class and of ten shades (six natural tooth shades and four blend tooth shades). Accessories shall be but one type, grade, and class. Gives requirements for workmanship, liquid, powder, testing consistency, time of setting, ultimate compressive strength, opacity, solubility and disintegration, arsenic content, accessories, shade guide, measuring device, and instruction; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification U-C-211; 1940. Cement; Zinc-Phosphate, Dental. Covers one type and grade. Gives requirements for time of setting, ultimate compressive strength, film thickness, disintegration and arsenic; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification U-D-226; 1941. Amendment 1; 1942. Denture-Base Material (Acrylic Resin or Mixtures of Acrylic and Other Resins). Covers three types— (I) powder and liquid, (II) plastic cake, and (III) powder; and two classes—(A) pink and (B) clear. Gives requirements for material, toxicity and irritation, certification, workmanship, translucency, satisfactory working qualities, porosity, color, uncured material and cured resin; methods of inspection and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification U-I-496; 1940. Impression Material; Hydro Colloidal, Dental. Covers one type, one grade, and one class. Gives requirements for material, workmanship, temperature of gel formation, and strain in compression; methods of inspection and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification U-I-456; 1940. Investment; Casting, Inlay, Dental. Covers one grade in two types—(I) medium expanding and (II) high expanding. Gives requirements for material, workmanship, setting expansion, thermal expansion, compressive strength, setting time, and fineness; methods of inspection and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification U-M-506; 1940. Modeling-Compound; Dental. Covers one grade in two types—(I) impression and (II) tray; in cakes, sticks, wafers, or cones. Gives requirements for material and workmanship, physical properties, color, and flow; methods of inspection and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification U-S-746; 1945. Stone; Artificial, Quick-Setting (Dental). Covers one type, grade, and class. Gives requirements for material, workmanship, instructions, description, fineness, time of set, compressive strength, setting expansion, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification U-W-141; 1943. Wax; Casting, Inlay, Dental. Covers two types—(I) cones and (II) sticks. Gives requirements for material, workmanship, working range and thermal expansion, properties, and flow; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DD-S-431; 1944. Slabs; Cement-Mixing, Glass, Plain, Dental. Covers one type, grade, and class. Gives requirements for material, workmanship, surfaces, edges, finish, sizes, and dimensions; method of sampling and inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-B-120; 1944. Base-Plates; Dental. Covers one type, one grade, and two classes—(A) upper form and (B) lower form. Gives requirements for material, workmanship, adaptability, cooling, transverse strength, bending, color, dimensions, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-B-476; 1945. Blocks; Soldering, Asbestos, Dental. Covers one type and grade. Gives requirements for material, workmanship, description, dimensions, tolerance, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-H-572; 1944. Holders; Mercury (Dental). Covers one type, grade, and class. Gives requirements for material, workmanship, description, internal construction, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-P-106; 1941. Paper; Articulating. Covers two types—(I) blue and (II) red; and two classes—(A) sheets and (B) rolls. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-C-611; 1944. Covers; Bracket-Table, Dental, Paper. Covers one grade, one class, and two types—(I) square and (II) round. Gives requirements for material, workmanship, shapes, thickness, color, weight, bursting strength, and absorption; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DDD-N-101; 1943. Napkins, Gauze; Sterile, Dental. Covers one type, grade, size, and color. Gives requirements for material, workmanship, cutting, size, and sterilization; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 57C19; 1941. Covers; Headrest, Paper, Dental.

U. S. Gov., Navy Dept. Specification 57F7; 1941. Floss; Silk (Waxed), Dental.

U. S. Gov., Navy Dept. Specification 57M3; 1941. Mandrels; Dental, Compensating.

U. S. Gov., Navy Dept. Specification 57R1; 1940. Receptacles; Waste, Dental.

U. S. Gov., Navy Dept. Specification 57P3a; 1944. Rolls; Dental-Instrument, Canvas, Empty.

U. S. Gov., Navy Dept. Specification 57S16; 1941. Screw Posts, for Amalgam Restorations (Dental).

U. S. Gov., Navy Dept. Specification 62P3; 1941. Platinum-Foil; Dental.

U. S. Gov., Treasury Dept., Procurement Div., No.366. 1939. Plaster of Paris; Orthopedic and Impression

(Dental). Shall contain not less than 93 percent calcined gypsum, dry, and free from foreign material and partly set or caked lumps. Gives detail requirements as to fineness, setting expansion, testing consistency, compressive strength, and setting time; methods of inspection and tests; and packing and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1089A; 1944. Rouge; Sticks, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1093; 1939. Gutta-percha; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1095; 1939. Moldine.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1098; 1939. Powder; Control, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1099A; 1940. Wax; Base Plate, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1100; 1939. Wax; Boxing, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1101; 1939. Wax; Casting, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1103A; 1941. Wax; Crown, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1104; 1939. Wax; Impression, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1106; 1939. Cement; Silicate, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1107; 1939. Investment Compound.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1111; 1940. Cement; Temporary, Anodyne.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1115; 1941. Wax; Casting, Inlay, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2128B; 1942. Facing and Backing Assortment; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2336A; 1941. Wheel, Brush, for Dental Laboratory Lathe.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2434B; 1942. Stone; Artificial, Dental Modeling.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2435A; 1941. Box; Viewing, for Dental Films.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2436B; 1942. Mount; Dental Film.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2468; 1939. Napkin; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2478A; 1944. Cleaners; Pulp Canal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2479; 1939. Floss; Dental, Waxed Silk.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2480; 1939. Paste; Dental, Abrasive.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2481; 1939. Cement; Germicidal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2505; 1939. Articular; Crown and Bridge.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2526; 1939. Anvil; Cast Base, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2538; 1939. Paste; Antiflux.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2577; 1939. Pot; White, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2580; 1939. Articulator Outfit.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2590A; 1941. Retainer; Matrix.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2591; 1939. Band; Retainer, Matrix.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2620; 1939. Tray; Metal, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2629; 1939. Clamp; Rubber Dam.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2631; 1939. Forceps; Rubber Dam, Clamp.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2632; 1939. Holder; Rubber Dam.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2633; 1939. Weight; Rubber Dam.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2674A; 1941. Tray; Impression, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2678; 1939. Wire; Dentimeter.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2679; 1939. Celluloid Strips; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2689; 1939. Speculum; Mouth, Equine.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2693; 1939. Engine; Dental, Electric, With Folding Bracket.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2694; 1939. Frame; Heating, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2695; 1939. Solder; Soft, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2709A; 1945. Pan; Pickling.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2711; 1939. Tap and Die Sets; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2722; 1939. Ladle; Melting, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2723; 1939. Roller; Gold.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2725; 1939. Swager.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2726; 1939. Teeth; Shade Guide.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2727A; 1940. Wire; Nickel Silver, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2748A; 1941. Solder; Gold.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2749; 1939. Outfit; Repair, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2765; 1939. Splasher; Dust, for Lathe; Electric, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2767A; 1944. Points; Aseptic, Absorbent.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2768A; 1940. Press; Flask, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2813; 1939. Crown; Assortment No. 10.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2814; 1939. Heater for Modeling Compound.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2815; 1939. Scale; Inlay Investment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2816; 1939. Lamp; Alcohol, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2817; 1939. Machine; Casting, Centrifugal, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2819; 1939. Compress for Flasks; Vulcanizer, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2820; 1939. Vulcanizer, With Attachments for Gas and Kerosene, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2821A; 1940. Wheel; Cloth, Buffing, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2840A; 1940. Bowl; Rubber, for Plaster, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2841; 1939. Broach; Smooth, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2842; 1939. Mortar and Pestle; Amalgam, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2843; 1939. Polisher; Rubber Cup, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2845; 1939. Wheel; Chamois, for Dental Laboratory Lathe.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2859; 1939. Brush; Tooth Polishing, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2860; 1939. Cervical-Matrix; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2861; 1939. Cone and Wheel; Felt, for Dental Laboratory Lathe.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2865; 1939. Chair; Dental, Portable.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2869; 1939. Solder; Silver, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2870; 1939. Wheel; Flexible, Engine, Abrasive, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2878; 1939. Aspirating Unit; Dental Operating Unit.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2886; 1939. Bench; Laboratory, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2887-A; 1944. Cabinet; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2898A; 1940. Cover; Paper, Round, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2904; 1939. Disk; Carborundum, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2905; 1939. Disk; Paper, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2906; 1939. Disk; Metal, Abrasive, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2908; 1939. Wheel; Carborundum, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2913C; 1945. Trays; Impression Compound.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2917A; 1940. Strip; Polishing, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2918; 1939. Strip; Metal, Abrasive, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2936A; 1940. Wire; Ligature, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2943; 1939. Band; Copper, and Chest for, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2944; 1939. Base Plate; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2946; 1939. Handpiece; Dental Engine.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2949B; 1942. Lathe; Electric, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2950; 1939. Float; Dental, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2965A; 1941. Unit; Operating, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2980A; 1945. Investment; Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2990; 1941. Teeth; Vulcanite.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3015; 1944. Clasp; Loop.

U. S. Gov., Veterans Administration. Specification VA-D-4e; 1942. Dental Model Plaster.

U. S. Gov., Veterans Administration. Specification VA-D-8h; 1943. Artificial Stone; Quick Setting.

U. S. Gov., Veterans Administration. Specification VA-D-14; 1935. Base Plate Forms for Trial Plates.

U. S. Gov., Veterans Administration. Specification VA-D-22a; 1942. Wax; Base Plate, Pink.

U. S. Gov., Veterans Administration. Specification VA-D-26a; 1943. Compound Impression; Elastic (Without Agar).

U. S. Gov., Veterans Administration. Specification VA-DM-101a; 1942. Dental Lathe.

References.—Calcined gypsum for use in preparation of dental plasters, *see* 514.2.

915.2 SURGICAL AND MEDICAL INSTRUMENTS

U. S. Gov., Federal Specification GG-I-526; 1943. Instruments; Dental and Surgical; General Specifications. Covers five grades—(1) carbon steel, (2) corrosion-resisting steel, (3) cobalt-chromium-tungsten alloy, (4) miscellaneous, and (5) unclassified. Gives detail requirements as to dimensions, style and design, construction, methods of sampling, inspection and tests, and packaging and packing.

915.20 General Items

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2996; 1941. Surgical Instruments; Composition of, General Material Specifications.

915.21 Bougies

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2149A; 1941. Bougie a Boule; Metal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2180A; 1941. Bougie; Filiform, Whalebone.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2204A; 1941. Bougie a Boule; Woven, Boilable.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2205A; 1941. Bougie; Urethral, Olivary, Woven, Boilable.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2732; 1939. Bougie; Eustachian.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2993; 1941. Filiform Bougie, With Screw.

915.22 Catheters

American Hospital Assn., 10-22. Female Urethral Glass Catheter. Covers one type (three sizes in set). Based on U. S. Army Specifications 10-2176A.

American Hospital Assn., 10-25. Regular Non-Graduated Urethral Catheters. Covers one type in three sizes.

American Hospital Assn., 43-7. Non-Graduated X-Ray Urethral Catheters. Covers one type in three sizes.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2109A; 1942. Catheter; Urethral, Metal, Double Flow.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2110A; 1942. Catheter; Urethral, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2162 A; 1941. Catheter (Urethral) Guide.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2176A; 1941. Catheter; Urethral, Female, Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2206A; 1941. Catheter; Urethral, Woven.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2307A; 1942. Catheters; Eustachian.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2640; 1939. Catheter; Mare, Metal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2672; 1939. Catheter; Urethral, Self Retaining.

References.—Catheters, rubber, *see* 204.55.

915.23 Depressors

American Hospital Assn., 10-34. Wood Tongue Depressor. Covers one type, one grade, and one class.

U. S. Gov., Federal Specification GG-D-226; 1942. Depressors; Tongue, Wood. Covers one type, grade, and size. Gives requirements for variations and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2105A; 1942. Depressor; Tongue, Bosworth.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2174A; 1941. Depressor; Tongue, Folding, Fenestrated, Snowden.

915.24 Mirrors

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2165C; 1942. Mirrors; Laryngeal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2219A; 1942. Mirror; Headband.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2429A; 1941. Mirror; Hand.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2472; 1939. Mirror; Mouth.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2507; 1939. Shield; Mirror.

915.25 Sphygmomanometers

American Hospital Assn., 10-40. Mercurial Sphygmomanometer. Covers one type, one grade, and one class. Based on U. S. Army Specifications 10-2804 for Mercurial Sphygmomanometer and U. S. Gov. Federal Specification ZZ-R-601a for Methods of Physical Tests and Chemical Analysis of Rubber Goods.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T352; 1927. Use and Testing of Sphygmomanometers. Includes methods of testing against a standard instrument, tolerances allowed for mercurial and for aneroid instruments, standard required for issuance of certificate for instruments tested.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2125B; 1940. Sphygmomanometer; Aneroid.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2804; 1939. Sphygmomanometer; Mercurial.

915.26 Stethoscopes

U. S. Gov., Navy Dept. Specification 57S13; 1941. Stethoscopes.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2856A; 1944. Stethoscope; Edward-Ford, Bell-Shaped.

915.27 Syringes and Needles

American Hospital Assn., 10-43. Ear and Dose Syringe. Covers one type, one grade, and two classes—ear, 2 oz.; dose, 1 oz.; dose, 2 oz.; and dose, 4 oz. Based on U. S. Army Specification 10-2431.

American Hospital Assn., 10-46. Luer All-Glass Syringes. Covers three types in several sizes and models. Based on U. S. Gov. Federal Specification GG-S-921a.

American Hospital Assn., 10-55. Plungerless Glass Syringes. Covers one type, one grade, and two classes—(I) ear and ulcer and (II) Dakin's Solution. Based on U. S. Army Specifications 10-2807A.

American Hospital Assn., 10-58. Intramuscular Glass Syringes. Covers one type, one grade, and five classes (Luer).

American Hospital Assn., 10-61. All-Glass Tuberculin Syringes. Covers Luer type, 1 cc. capacity, graduated in minims and 1/100 cc.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 62. Syringes; Hypodermic, Glass, Luer Type.

U. S. Gov., Federal Specification GG-N-196; 1940. Amendment No.3; 1944. Needles; Hypodermic, for Luer Syringes. Covers two types—(I) having a canula of high chromium, high nickel, and low carbon type corrosion resisting steel and (II) having a canula of high carbon, low chromium, and low nickel type corrosion resistant steel; three styles for points—(A) regular bevel, (B) short bevel, and (C) very short bevel; and two styles for hubs—(1) without flange or lug to engage locking device on syringe and (2) with a flange or lug to engage locking device on syringe. Gives requirements for material and workmanship, canula, point, hub, locking flange or lug, marking, and details for each type and style; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-N-211; 1943. Needles; Surgeons' (Suture). Needles shall be of twelve types, four classes, five points, two grades, and sizes as listed. Covers material and workmanship, general requirements, detail requirements, methods of sampling, inspection, tests, packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-S-921a; 1940. Amendment 1; 1944. Syringes; All-Glass, Luer. Covers three types—(I) general purpose (small Luer tip), (II) general purpose (large Luer tip), and (III) special purpose. Gives requirements for material and workmanship, syringe, barrel, flange, tip, graduations and other markings, plunger, plunger brake, capacities and dimensions, and details for each type; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57S57; 1944. Syringes; Urethral, Glass, With Elastomer Bulb.

U. S. Gov., Navy Dept. Specification 57W11; 1944. Wires; Hypodermic Needle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2071B; 1942. Needle; Aneurism, Copper.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2085A; 1941. Needles; Paracentesis, Desmarres.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2086D; 1941. Needles; Spinal Puncture.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2175A; 1941. Syringe; Urethral, Prophylaxis.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2213A; 1941. Syringe; Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2223C; 1940. Syringe; Water.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2243A; 1940. Holder; Needle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2318A; 1942. Needle; Post-Mortem.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2416A; 1941. Blower, Chip, and Hot-Air Syringe.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2431A; 1942. Syringe; Ear and Nose.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2628A; 1942. Needle; Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2754; 1939. Needle; Aneurism, Little.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2779; 1939. Needle; Seton.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2791; 1939. Syringe; Hypodermic, Hog Cholera Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2796A; 1942. Needle; Infusion, Straight.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2807A; 1940. Syringe; Glass, Plungerless.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2916; 1939. Syringe, for Impression Compound.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2925; 1939. Syringe; Hypodermic, Metal, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2926; 1939. Needle for Syringe; Hypodermic, Metal, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2948; 1939. Block; Container for Mallein Syringes and Needles.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2954; 1939. Case; Hypodermic Tablets, Veterinary, Empty.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2978; 1940. Needle; Pedicle, Ivy.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3006; 1942. Introducer; Needle.

U. S. Gov., Veterans Administration. Specification VA-D-12d; 1944. Dental Hypodermic Needles.

U. S. Gov., Veterans Administration. Specification VA-D-25; 1942. Dental Hypodermic Needles; Platinum-Ruthenium.

U. S. Gov., Veterans Administration. Medical and Hospital Supply Section, VA-H-25b; 1936. Anesthesia Hypodermic Needle With Insertion Stop.

U. S. Gov., Veterans Administration. Medical and Hospital Supply Section, VA-H-26c; 1936. Spinal Anesthesia Hypodermic Needle—Pitkin.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-27c; 1936. Spinal Anesthesia Hypodermic Needle—Quincke.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-28b; 1936. Straight and Curved Tonsil Hypodermic Needle.

U. S. Gov., Veterans Administration. Medical and Hospital Supply Section, VA-H-86; 1936. Allergen Syringes.

References.—Dental hypodermic needle sizes and varieties, *see* 915.10; rubber fountain syringe, *see* 204.26.

915.28 Wooden Applicators

American Hospital Assn., 10-1. Metal Applicators. Covers four types, one grade, and one class. Type I, nasal aluminum; type II, nasal steel; type III, pharyngeal, and type IV, surgical. Based on U. S. Army Specifications 10-2087A.

American Hospital Assn., 10-4. Wood Applicators. Covers one type, one grade, and one class.

U. S. Gov., Federal Specification GG-A-616; 1942. Applicators; Wood. Covers two types—(I) plain and (II) cotton tipped; and two classes—(A) short length and (B) long-length. Gives requirements for material and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2087A; 1941. Applicators.

915.29 Miscellaneous Surgical and Medical Instruments

American Medical Assn. Council on Physical Medicine. Minimum Requirements for Acceptable Audiometers, 1942. Gives requirements for frequencies, attenuation, range, wave form, extraneous noises, power supply, ruggedness of construction, uniformity of calibration, standard for reference, audiogram or auditory chart, definition of threshold of hearing, and marketing and advertising.

U. S. Gov., Federal Specification GG-H-166; 1945. Head-Bands (for Mirror); Leather; (for Medical and Surgical Use). Covers one type, one grade, and two classes—(A) narrow and (B) wide. Gives requirements for material, workmanship, marking, description, leather band, buckle, metal shield, clamp, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-T-746; 1943. Tubes; Diagnostic, Ear (Toynbee). Shall be of one type and one grade and of the style and design as specified in the invitation for bids. Gives requirements for material, workmanship, tubing, and ear tips; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 57F8; 1941. Forceps; Cover-Glass (Stewart).

U. S. Gov., Navy Dept. Specification 57 L 10; 1943. Lamps; Antral.

U. S. Gov., Navy Dept. Specification 57S18; 1941. Syringes; Urethral, Piston Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-1070A; 1941. Specula; Ear, Brown, Set of Three.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-1083A; 1941. Retractor; Abdominal, Self-Retaining, Balfour.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2022A; 1939. Microtome Knives, With Backs and Handles.

U. S. Gov., U. S. Army, Medical Dept.. Specification 10-2074A; 1941. Elevators; Nasal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2077A; 1941. Forceps; Bone, Rongeur and Cranial.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2078; 1926. Forceps; Bone, Mastoid.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2079A; 1941. Forceps; Bone Holding.

U. S. Gov.. U. S. Army, Medical Dept. Specification 10-2080B; 1942. Specula; Nasal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2081A; 1941. Speculum; Nasal, Septal, Goldstein.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2082A; 1941. Sound; Uterine, Simpson.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2084A; 1942. Elevator; Dura.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2088A; 1941. Bronchoscopes; Electric, Jackson.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2089A; 1941. Canulas; General.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2090B; 1941. Curettes; Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2091A; 1941. Drum; Test.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2092A; 1942. Dissector; Tonsil, Blunt, and Pillar Retractor.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2093A; 1941. Hammer; Percussion, Taylor.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2094A; 1942. Hammer; Steel With Hook, Post Mortem.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2095A; 1941. Otoscope; Pneumatic, Metal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2097B; 1941. Procto-Sigmoidoscope; Electric, Proximally Illuminated.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2099B; 1941. Repositors and Probe; Iris.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2101B; 1942. Snare; Nasal, Krause.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2103A; 1941. Speculum; Nasal, Bivalve, Sims's.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2104B; 1942. Tractor; Prostatic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2106A; 1941. Vein Stripper; Mayo.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2107B; 1941. Carrier; Ligature, Right.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2112B; 1941. Clamp; Hemorrhoidal, Kelsey,

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2113A; 1942. Dilator; Lachrymal, Ziegler.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2114A; 1941. Dilator; Trachea.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2115A; 1941. Elevators; Periosteum.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2116A; 1942. Gag; Mouth, Denhardt.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2118A; 1941. Mallet; Hardwood, With Seamless Metal Rings.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2119A; 1942. Pelvimeter; Martin.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2120A; 1941. Saws; Surgical and Post-Mortem.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2121A; 1942. Screw Driver; Sherman.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2122A; 1941. Screw; Oral.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2123A; 1941. Speculum; Eye, Ziegler,

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2124A; 1941. Speculum; Nasal, Bosworth.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2130A; 1941. Scissors, Surgical and Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2131A; 1941. Raspatory, Mastoid and Sinus.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2132A; 1942. Rachiotome.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2134B; 1942. Drill; Cranial, Brace With Burr and drill.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2137V; 1942. Drill; Bone, Complete With Drill and Three Points.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2139A; 1942. Spuds; Eye.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2141A; 1941. Plate; Lid, Jaeger.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2142A; 1942. Dilator; Uterine.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2143B; 1944. Hook; Strabismus.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2145A; 1941. Lens; Eye, Condensing.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2146B; 1942. Saw; Stille-Gigli.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2147A; 1941. Saws; Gigli, Handle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2150A; 1941. Retinoscope; Plain, Thorington.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2151A; 1941. Screw Driver; Lane.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2152B; 1941. Speculum; Vaginal, Weighted.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2153B; 1942. Spoons; Lens.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2154B; 1944. Trephine; Cranial, Galt.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2161B; 1941. Adenotome; La Force.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2166B; 1942. Retractors; Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2177C; 1944. Cystotome; Eye.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2179B; 1942. Director; Grooved, Probe Pointed.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2181A; 1941. Hemostat; Tonsil, Boettcher.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2182A; 1941. Hook; Iris.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2184A; 1939. Mallets; Lead Filled.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2185A; 1941. Probe; Uterine, Sims's.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2186A; 1941. Rasps; Frontal Sinus.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2188A; 1941. Speculum; Vaginal, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2191B; 1942. Probe; Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2192A; 1941. Saw; Plaster of Paris.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2196B; 1942. Cystoscope; Braasch.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2197B; 1941. Forks; Tuning.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2198A; 1941. Hook; Dura, Frazier.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2199A; 1941. Speculum; Eye, Nonmagnetic, Weeks.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2200A; 1941. Speculum; Vaginal, Sims's.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2216A; 1941. Speculum; Eye, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2217A; 1941. Speculum; Vaginal, Bivalve, Graves.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2218; 1928. Tube; Trachea.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2225B; 1942. Intubation Set.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2230B; 1942. Forceps; Hemostatic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2240A; 1942. Forceps; Surgical, Miscellaneous, No. 1.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2241B; 1942. Forceps; Surgical, Spring, Special.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2242B; 1941. Forceps; Surgical. Miscellaneous, No. 2.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2277B; 1942. Knife; Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2308A; 1942. Chisel and Osteotome; Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2314A; 1942. Gag; Mouth, Hennings.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2327; 1938. Ophthalmoscope; Electric.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2328A; 1941. Otoscope; Electric.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2330B; 1942. Spreader; Rib, McGuire.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2331A; 1942. Trocars and Canulas.

U. S. gov., U. S. Army, Medical Dept. Specification 10-2332B; 1942. Trocar; Gall Bladder, Ochsner.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2334A; 1942. Splint; Cabot.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2339; 1939. Splint; Liston.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2340B; 1942. Splint; Thomas, Arm.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2341B; 1942. Splint; Army, Leg.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2343A; 1942. Clamp; Pylorus, Payr.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2474; 1939. Case; Diagnostic, Eye, Ear, Nose, and Throat.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2531; 1939. Strop; Microtome, Knife, Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2532A; 1940. Burnisher; Stellite.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2536; 1939. Drill; Bone, With Detachable Metal Handle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2539; 1939. Snare; Wire.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2541; 1939. Cautery; Large, Burner.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2542; 1939. Cautery; Nasal, Burner.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2547A; 1942. Speculum; Nasal, Myles.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2552A; 1944. Sounds; Urethral, Van Buren.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2555A; 1942. Tube; Perineal Drainage.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2557A; 1944. Dilators; Urethral, Lefort.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2558A; 1942. Gouge; Bone.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2567; 1939. Snare; Tonsil, Eye.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2571; 1939. Cautery; Eye, Burner.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2574; 1939. Headlight; Metal Band.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2575; 1939. Cautery; Handle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2593; 1939. Lancet; Blood.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2594; 1939. Tube; Diagnostic, Ear.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2597A; 1940. Director; Grooved.

U. S. Gov., U. S. Army. Medical Dept. Specification 10-2598A; 1942. Elevator; Periosteal, Sharp.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2599; 1939. Forceps; Tissue, Spring.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2600; 1939. Perimeter; Hand, Schweigger.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2604; 1939. Pliers; Dressing.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2605; 1939. Probe; Abscess.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2610; 1939. Retractor; Buckley.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2611A; 1942. Retractor; Abdominal, Double-Ended.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2636; 1939. Rule; Prince.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2637; 1939. Burr; Ventricular, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2638; 1939. Canula; Hoof.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2643; 1939. Curette; Nail Hole.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2644; 1939. Curette; Fistula.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2645; 1939. Curette; Double End.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2649; 1939. Forceps; Splinter, 8-In., Veterinary

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2650; 1939. Mallet; Lead, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2652; 1939. Splitter; Hoof.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2653; 1939. Tester; Hoof.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2665; 1939. Mallet; Aluminum, Meyerding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2680A; 1941. Strops; Microtome Knife, Laboratory.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2683A; 1942. Adapter; Eynard.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2686; 1939. Hook; Neurectomy, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2687; 1939. Parer; Hoof, 12-In.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2688; 1939. Pump; Combination, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2698A; 1939. Forceps; Tenaculum, Straight.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2699; 1939. Shear; Rib.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2701; 1939. Perimeter; Brombach.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2716; 1939. Tonometer; McLean.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2735; 1939. Cord; Cautery, Heavy.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2736; 1939. Iron; Cautery.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2738; 1939. Punch; Forceps.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2750; 1939. Forceps; Bone Cutting, Straight.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2755A; 1942. Retinoscope; Electric.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2776; 1939. Case; Bone Operating, Electric, Albee.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2781; 1939. Stylet; Reed.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2783; 1939. Clipper; Two Hand, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2784; 1939. Shear; Fetlock.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2785; 1939. Ecraseur; Spaying.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2786; 1939. Emasculator; Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2789; 1939. Retractor; Laryngeal, Self Retainer, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2792; 1939. Trocar and Canula; Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2794; 1939. Tube; Tracheal, Metal, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2795; 1939. Cystoscope.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2797A; 1942. Shear; Plaster of Paris.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2800; 1939. Cord; Cautery, Regular.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2802; 1939. Monometer; Spinal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2803; 1939. Phorometer.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2809A; 1940. Tube; Duodenal, Rehfuss.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2836; 1939. Fluoroscope; Operating.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2847; 1939. Gun; Balling.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2850; 1939. Hook; Gland, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2851; 1939. Knife; Hoof, Three Blades and Iron Handle, in Canvas Roll.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2852; 1939. Probe; Surgical, Jointed, 10-In. Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2855A; 1941. Audiometer.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2858; 1939. Tube; Duodenal, Buckstein, Tip.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2864; 1939. Localization-Eye; Complete, X-Ray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2882; 1939. Knife; Operating, Hoof.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2914; 1939. Bistoury; Surgical, 2-In. Blade, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2920; 1939. Clipper; Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2934A; 1940. Knife; Operating, Handle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2935; 1939. Knife; Operating, Detachable Blade, Blade Only.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2969A; 1941. Wire; Corrosion Resisting Steel, Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2976; 1940. Elevator; Malar, Ivy.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2986; 1941. Scoop; Gall-Bladder.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2999; 1941. Case; Bronchoscopic, Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3005; 1942. Tong; Skull Traction.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3016; 1944. Knife; Skin Grafting, Large, and Blade.

U. S. Gov., U. S. Army, Medical Dept. Specification 17-179; 1939. File; Hoof Knife.

U. S. Gov., U. S. Maritime Commission. Specification 57-MC-1; 1944. Resuscitators; Hand Operated, Portable. Covers one type and grade. Gives requirements for materials, workmanship, construction, carrying case, physical requirements, finish, weight, instructions, and marking; inspection, sampling, and methods of tests; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-X-181c; 1943. Suction-Pressure Therapy Unit.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-98b; 1944. Audiometer.

References.—Clinical thermometers, *see* 919.83.

915.3 MEDICAL AND HOSPITAL EQUIPMENT

915.30 General Items

American Medical Assn., Council on Physical Therapy. Regulations to Govern Advertising of Ultraviolet Generators to the Public Only, 1932. Regulations To Govern Advertising of Ultraviolet Generators to the Medical Profession Only, 1934.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Anaesthetic Gases and Oxygen in Hospitals.

Recommended good practice for construction and installation of piping systems for the distribution of anaesthetic gases and oxygen in hospitals and similar occupancies, and for construction and operation of oxygen chambers. General requirements, including color identification of pipe lines, manifold anaesthetic cylinders to headers for distribution, emergency shut-off valves, lighting, heating and air conditioning apparatus, static precautions, open flames, fire protection, and oxygen tents.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R176-41; 1941. Color Marking for Anesthetic Gas Cylinders. This recommendation covers the marking of gas cylinders of approximately 4 1/2 in. in diameter and 26 in. long, and smaller, for use on anesthesia machines, with certain colors or color combinations, covering various kinds of gases. This recommendation does not apply to compressed gas cylinders used in hospitals for any purpose other than anesthesia. Sponsored by the American Hospital Assn. and American Society of Anesthetists.

915.31 Disinfectors, Inhalers and Irrigators

American Medical Assn., Council on Physical Therapy. Acceptance of Ultraviolet Lamps for Disinfecting Purposes, 1942. Includes physical data on germicidal lamps and tentative requirements for acceptance of ultraviolet lamps for disinfecting air.

U. S. Gov., Federal Specification GG-D-416; 1941. Disinfectors; Steam-Jacketed. For pressure sterilization of large articles, such as mattresses, pillows, blankets, and clothing, at not less than 15 lb. per square inch, as well as for drawing a vacuum. Covers two types—(I) having one door and (II) having two doors. Gives requirements for size, thickness of shell and back head plates, thickness of doors, and locking arms per door; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification, RR-I-681; 1940. Irrigators; Corrosion-Resisting Steel. Covers two classes—(A) 1-qt. capacity and (B) 2-qt. capacity; one grade; and two types—(I) with handle and (II) without handle. Gives requirements for material, workmanship, construction, design, measurements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57D1c; 1944. Disinfectors; Steam-Jacketed, Rectangular, With Formaldehyde-Ammonia Attachment.

U. S. Gov., Navy Dept. Specification 57I2; 1941. Inhalers; Vapor, Electric.

U. S. Gov., Navy Dept. Specification 57N1; 1941. Nozzles; Irrigating, Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2164A; 1942. Douche; Uterine.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2183B; 1942. Irrigator; Anterior Chamber.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2220A; 1942. Inhaler; Yankauer, Metal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2226A; 1939. Irrigator; Valentine, Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2646; 1939. Disinfector; 50-Gal., With Spray Pump.

915.32 Sterilizers

American Medical Assn., Council on Physical Therapy. Acceptance of Ultraviolet Lamps for Disinfecting Purposes, 1942. Includes physical data on germicidal lamps and tentative requirements for acceptance of ultraviolet lamps for disinfecting air.

American Hospital Assn., 70-22. Jars for Dressings. Covers one type, one grade, and one class. Based on U. S. Gov., War Dept., Specifications 10-2399.

U. S. Gov., Federal Specification GG-S-751a; 1940. Sterilizers; Accessories and Portable Lockers (for Sterilizers). Covers five types—(I) dressing sterilizers, (II) instrument sterilizers (pressure and boiling), (III) utensil sterilizers (pressure and boiling), (IV) water sterilizers, and (V) combination sterilizers; accessories for pressure sterilizers; and lockers for use with combination sterilizers. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2399; 1939. Jar for Dressings.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2477; 1939. Sterilizer; Hypodermic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2492; 1939. Sterilizer; Instruments, Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2496; 1939. Sterilizer; Hypodermic Needle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2625; 1939. Sterilizer Drum.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2662B; 1941. Sterilizer; Hot Air.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2751; 1939. Sterilizer; Dressing and Utensil, Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2832; 1939. Sterilizer; Instrument, Field, With Alcohol Stove.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2901; 1939. Sterilizer; Controls.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-67c; 1942. Bed Pan Sterilizers.

References.—Electric heaters, *see* 717.1.

915.33 Litters and Stretchers

U. S. Gov., Navy Dept. Specification 57L2c; 1943. Litters; Metal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2002; 1927. Litter; Metal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2279A; 1941. Litter, With Slings.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2453A; 1941. Litter; Aluminum Pole.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2981; 1940. Carrier; Field, Collapsible.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2994; 1941. Litter; Aluminum Pole, Folding.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-47; 1933. Adjustable Leg Rest.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-82a; 1935. Litters Without Slings.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-110; 1940. Wheel Stretchers—Adjustable Type.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-111; 1940. Wheel Stretchers.

915.34 Atomizers

American Hospital Assn., 10-7. Hand Atomizers. Covers two types—(I) with metal collar on neck and (II) with glass threaded neck. Based on U. S. Gov. Federal Specification GG-A-761.

U. S. Gov., Federal Specification GG-A-761; 1938. Amendment 4; 1944. Atomizers; Hand. Covers one type capable of spraying heavy oils as well as aqueous solutions and withstanding frequent sterilizations by boiling water without damage. Gives requirements for material, workmanship, reservoir, spraying device, spray tip, spray cap, nasal guard, bulb and tubing, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 57A17; 1944. Atomizers, for Use With Air Compressor.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2658A; 1941. Atomizer Set.

915.35 Rubber Goods

American Hospital Assn., 70-7. Cloth-Inserted Ring Cushions. Covers one type. Based on U. S. Gov. Federal Specifications ZZ-C-791.

References.—Rubber bandages, adhesive plaster, *see* 204.1; rubber ice bags, hot water bottles, cushions, pillows and pillow cases, syringes, politzer bags, *see* 204.2; rubber sheeting, *see* 204.33; dental rubber dam, *see* 204.4; rubber aprons, gloves, finger cots, operating pads, stomach and colon tubes, catheters, *see* 204.5; rubber tubing for laboratory use, *see* 204.6; rubber cement, stoppers, crutch tips, *see* 204.9

915.36 Hospital Furniture

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 44. Tables; Over-Bed, Hospital.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 61. Locker Tables; Bedside, Hospital.

U. S. Gov., Navy Dept. Specification 26T3b; 1942. Tables; Bedside (Locker), Hospital.

U. S. Gov., Navy Dept. Specification 57T13; 1942. Tables; Overbed, Adjustable.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2392B; 1944. Table; Instrument, Adjustable.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2405; 1939. Chair; Specialist's.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2452A; 1941. Table; Examining.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2454; 1938. Table; Instrument.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2482A; 1940. Table; Operating, Pedestal Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2499A; 1939. Table; Tilting for Radiography and Fluoroscopy, Light Duty, Complete With Bucky Diaphragm.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2520A; 1941. Carriage; Wheeled.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2607A; 1941. Table; Instrument, Folding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2667; 1939. Table; Operating, Folding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2682; 1939. Table; Bedside, Folding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2775; 1939. Chair; Barany.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2911; 1939. Carriage; Dressing, Knocked-Down.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2912; 1939. Carriage; Wheeled, Knocked-Down.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2915; 1939. Table; Operating, Equine.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2931A; 1941. Table; Operating.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-36; 1939. Bar; Mosquito, Spreader.

U. S. Gov., U. S. Army, Medical Dept. Specification 32-41A; 1940. Screen; Bed.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-36f; 1942. Circular Instrument Table.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-37a; 1940. Utility Table, With Three Glass Shelves.

U. S. Gov., Veterans Administration. Specification VA-H-38f; 1942. Instrument Table; Unit Type.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-40h; 1942. Ward Dressing Carriage With Bucket and Basin Attachment.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-53e; 1942. Anesthesia Table With Removable Trays and With Racks for Masks.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-54a; 1939. Steel Examining Table.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-55d; 1942. Instrument and Dressing Table.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-62l; 1942. Cabinet Type Bedside Table.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-70a; 1939. Tray Type Bedside Tables.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-87a; 1940. Treatment and Dressing Table.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-92a; 1939. Utility Table.

U. S. Gov., Veterans Administration. Specification VA-X-119a; 1936. Massage Tables.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-107; 1939. Combination Chair-Table—Ear, Eye, Nose, and Throat Surgery.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-117; 1941. Mobile Type Barber Chair.

References.—Hospital and surgical beds and cots, *see* 613.1.

915.37 Bottles

U. S. Gov., Navy Dept. Specification 57P4; 1941. Pots; Ointment, Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2432A; 1941. Bottle; Balsam, Dropping, Specimen, Sputum and Citrate of Magnesia Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2987; 1941. Bottle; Aspirator.

References.—Blake tablet bottle sizes, *see* 955.1.

915.39 Miscellaneous Medical and Hospital Equipment

American Hospital Assn., 10-70. Murphy Drip Tube. Covers one type, one grade, and one class. Based on U. S. Army Specifications 10-2837.

American Hospital Assn., 43-10. Levy Counting Chamber With Covers. For examination of the spinal fluid.

American Hospital Assn., Council on Physical Therapy. Evidence Required by the Council on Physical Therapy for Consideration of Apparatus Used in Fever Therapy, 1937.

American Medical Assn., Council on Physical Therapy. Acceptance of Sunlamps, 1940. Utilizes the erythemal reaction as a basis of judging the effectiveness of ultraviolet ray sunlamps and includes requirements for acceptance of sunlamps and regulations to control advertising of sunlamps sold to the public.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 74. Electro-Surgical Unit.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 75. Electro-Cardiograph.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 77. Diathermy; Short Wave, Dual Frequency.

U. S. Gov., Federal Specification O-P-46; 1942. Pads; Heating, Chemical. Covers one type and one grade. Gives detail requirements for material, workmanship, inner case, size, outer case, jacket, heating materials, and refill; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification W-D-286; 1943. Amendment 2; 1944. Diathermy-Apparatus; Short-Wave. Covers two types—(I) single-frequency, (II) dual-frequency, for heating tissues beneath the surface of the skin. Gives requirements as to apparatus, generator, frequency-control device, radio-frequency power output stage, power supply, controls and indicators, cabinet and chassis, output, bid samples, and details for each type; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification GG-C-716; 1942. Crutches; Adjustable. Covers one type and one grade. Gives requirements for material, workmanship, construction, armpiece, bows, handpiece, footpiece, bolts, assembly, finish, and strength; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-W-101; 1944. Washers; Bedpan, Steam-Flushing. Covers one grade and three types—(I) floor mounted (class A, with vertical front door and class B, with horizontal top cover); (2) wall hung; and (3) wall recessed. Gives requirements for material, workmanship, general requirements, and detail requirements; methods of sampling, inspection, and test; and packing and marking for shipment.

U. S. Gov., Federal Specification RR-J-131; 1940. Jars; Dressing, Corrosion-Resisting Steel. Covers one type, one grade, and five sizes. Gives requirements for material, workmanship, construction, design, measurements, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1933. Sprayers; 1 Qt.

U. S. Gov., Navy Dept. Specification 41S44; 1944. Sprayers; Insecticide (Liquid), Hand-Operated.

U. S. Gov., Navy Dept. Specification 57B14; 1941. Baths; Eye Glass.

U. S. Gov., Navy Dept. Specification 57S14; 1941. Splints, Appliances, and Accessories.

U. S. Gov., Navy Dept. Specification 57T7; 1941. Test-Sets; Vision, Color-Sense (Pseudo-Isochromatic Plates).

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2005A; 1929. Spoon; Metal, for Typhoid-Carrier Examination.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2189A; 1942. Headband; Metal, Folding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2203A; 1941. Case; Aspirating, Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2207C; 1941. Apparatus; Extension, Steinmann.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2227A; 1937. Tube; Adapter, Y-Shaped.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2234A; 1941. Block; Bite; Adult's, Adolescent's and Child's.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2256A; 1941. Block; Embedding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2347; 1939. Intravenous Apparatus (Salvarsan).

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2389; 1939. Back Rest.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2425; 1935. Screen; Intensifying.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2487B; 1941. Cocoa Unit; Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2490; 1939. Tile, Pill.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2495; 1939. Arbor; Expanding, for Abrasive Bands.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2498; 1939. Urinalysis Set.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2500A; 1944. Bath; Leg, Whirlpool, With Electric Turbine Ejector.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2501; 1939. Bath; Arm.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2529; 1939. Cane; Walking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2533; 1939. Bell; Call.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2537; 1939. Lamp; Alcohol.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2548A; 1940. Vision Test Set.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2549; 1939. Knives; Office and Plaster.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2562; 1939. Holder; Cotton.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2606A; 1941. Pad for Operating and Examining Table.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2612; 1939. Buckshot; Coarse, for Balkan Frame.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2613; 1939. Bandage Winder.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2614; 1939. Headlight; Murphy.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2624; 1939. Tile; Pill, Dispensary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2626; 1939. Strap and Buckle; Orthopedic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2642; 1939. Cradle; Neck.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2660; 1939. Poles; Balkan Frame.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2661; 1939. Pulley Assembly; Balkan Frame.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2668; 1939. Cassette Changer.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2681; 1939. Restraint Apparatus.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2691; 1939. Trier; Meat and Dairy.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2705; 1939. Dissolver; Hypodermic Tablet.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2715; 1939. Warmer; Dish.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2717; 1939. Headband; Leather Strap.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2729; 1939. Apparatus; Diathermy.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2731; 1940. Buckle for Webbing; Orthopedic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2737; 1939. Color Test Book; Stilling.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2752; 1939. Case; Eye, Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2756A; 1940. Clamp for Balkan Frame.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2757; 1939. Color Test Book; Ishihara.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2758; 1939. Lantern; Muscle Test.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2759; 1939. Reflector; Angle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2760A; 1944. Support; Pelvic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2762A; 1940. Transilluminator.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2763A; 1940. Cuspidor; Fountain.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2766A; 1945. Dam; Mechanical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2770; 1939. Table; Aseptic and Gas Attachment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2782; 1939. Chart; Anatomical, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2798; 1939. Anesthesia and Suction Apparatus.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2799A; 1942. Frame; Bradford.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2805; 1939. Splint Strap; Adjustable Traction.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2806A; 1942. Splint Support and Foot Rest.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2808; 1939. Curtain; Tangent, Roller, and Folder Types.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2835; 1939. Apparatus; Anesthesia.

U. S. Gov., U, S. Army, Medical Dept. Specification 10-2837; 1939. Tube; Murphy Drip.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2838; 1939. Apparatus; Vision Test.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2839; 1939. Band; Arbor, Emery.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2854; 1939. Stocks; Metal, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2871A; 1941. Cabinet; Electric Light, Bath.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2872; 1939. Lamp; Therapeutic, Carbon Arc.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2873; 1939. Cart; Food, Drinkwater.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2877; 1939. Cardiograph; Electric.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2879B; 1942. Baker; Electric, Portable, Therapeutic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2884; 1939. Engine; Foot and Case.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2885; 1939. Warmer; Blanket.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2890; 1939. Screen; Lead, Protective.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2891; 1939. Lamp; Therapeutic, Mercury Arc, Water-cooled, and Applicators.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2892; 1939. Pad; Fingerprint, Complete.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2894A; 1941. Chart; Anatomical, Human Body.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2895A; 1942. Jacket; Camisole, Restraint.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2899; 1939. Apparatus; High Frequency, Therapeutic, Portable Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2900A; 1940. Stamp; Anatomical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2909A; 1942. Lamp; Therapeutic, Infra-Red.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2910A; 1941. Machine; Sinusoidal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2923; 1939. Retainer; Dressing, Foot, Metal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2927; 1939. Tackle Block; Safety Hoist, Medium Size, 2,000-lb. Capacity, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2929; 1939. Applicator and Conductor Tube for Howe's Treatment.

U. S. Gov., U. S, Army, Medical Dept. Specification 10-2930; 1939. Heater for Spray Bottles.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2941; 1939. Lamp; Therapeutic, Mercury Arc, Air-Cooled, and Burner.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2947; 1939. Stamp; Meat Inspection, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2966; 1939. Tent; Oxygen.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2988; 1941. Chlorine Test Set; Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2992; 1941. Suction Apparatus; Portable, Electric.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3000; 1942. Holder; Chart.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3004; 1942. Holder; Card.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3008; 1942. Tray Set; Type 8, for Gas Casualty, Chest.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 16-5; 1939. Sprayer; Insect, Electric, Large.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 16-6; 1939. Sprayer; Insect, Electric, Small.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 16-7; 1939. Sprayer; Hand, Knapsack Type.

U. S. Gov., Veterans Administration. Specification VA-G-115a; 1935. Liquid Insecticide Sprayer (Small Size)—Motor Blower-Vacuum Atomizer Type.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-23; 1933. Pack Bed.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-32a; 1934. Model With Mobile Table Immersion Bowl and Stand (Single).

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-83b; 1942. Anesthetists or Operators Revolving Stools.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-99b; 1944. Surgical Operating Room Lighting Fixture.

U. S. Gov., Veterans Administration. Specification VA-M-148c; 1940. Nine Shelf Serving Truck—36 Tray Type.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-93a; 1941. Electric Gauze and Bandage Cutter.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-108; 1939. Electrocardiograph.

References.—Other nospital utensils, *see* 915.4; X-ray equipment and dosage measurement, *see* 717.3.

915.4 HOSPITAL UTENSILS

915.41 Basins

American Hospital Assn., 10-10. Corrosion-Resisting Steel Pus Basins. Covers four sizes—extra small, small, medium, and large; all in one grade.

American Hospital Assn., 10-13. Corrosion-Resisting Deep Solution Basin. Covers one type and one grade.

American Hospital Assn., 10-19. Corrosion-Resisting Steel Sponge Bowls. Covers two sizes in one grade.

U. S. Gov., Federal Specification RR-B-126; 1940. Basins; Pus, Corrosion-Resisting Steel. Covers one grade, one type, and six sizes. Gives requirements for chemical composition, design, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-B-128; 1940. Basins; Solution, Corrosion-Resisting Steel. Covers one grade and five sizes. Gives requirements for chemical composition, construction, design, dimensions, tolerances, and grinding; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification RR-B-616; 1940. Amendmant 1; 1941. Bowls; Sponge, Corrosion-Resisting Steel. Covers one type, one grade, and three sizes. Gives requirements for material, workmanship, chemical composition, construction, and measurements; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification RR-T-771; 1940. Tubs; Foot, Corrosion-Resisting Steel. Covers one type, grade, and size. Gives requirements for material, workmanship, construction, design, measurements, tolerances, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 528; 1941. Enamelware; Hospital and Sickroom. Covers twenty types and a number of classes intended to include all kinds of enamelware vessels for hospital sickroom use. Color generally white. Gives requirements for material, thickness of metal, thickness of enamel, capacity, dimensions, handles, ears, bail, finish, impact resistance, solubility, welds, processing, trade mark, and pouring lips; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2034A; 1940. Basin; Staining.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2394A; 1941. Basin; Enamelware, Hand and Operating Room.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2396; 1939. Basin; Sponge.

915.42 Cups, Pouches, and Holders

American Hospital Assn., 55-16. Paper Cups. Covers three types—(A) flat bottom (1-piece), (B) flat bottom (2-piece), and (C) conical or wedge-shape. Gives requirements for material, capacity, weight, thickness, bursting strength, leakage, and construtiön.

American Hospital Assn., 55-19. Paper Sputum Cups. Covers three types in two grades each. Based on U. S. Gov., Federal Specifications UU-C-821a.

U. S. Gov., Federal Specification GG-H-555; 1944. Holders; Clinical-Chart. Covers two types—(I) single board and (II) book form; and two grades—(A) aluminum and (B) hardwood. Gives requirements for material, workmanship, marking, and details for each type and grade; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-C-821a; 1939. Amendment 1; 1944. Cups; Sputum, Paper. Covers three types—(I) knocked-down type with cover, (II) knocked-down type, refills, and (III) knocked-down type for pocket use; and two grades—(A) for general use and (B) for tropical use. Gives requirements for material, workmanship, bursting strength, leakage test, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57H1d; 1943. Holders; Clinical-Chart, Navy-Standard.

U. S. Gov., Treasury Dept., Procurement Div., No. 528; 1941. Enamelware; Hospital and Sickroom. Covers twenty types and a number of classes intended to include all kinds of enamelware vessels for hospital sickroom use. Color generally white. Gives requirements for material, thickness of metal, thickness of enamel, capacity, dimension, handles, ears, bail, finish, impact resistance, solubility, welds, processing, trade mark, and pouring lips; methods of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2031B; 1941. Holder; Petri Dishes.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2238; 1928. Cup; Spit, Holder.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2566; 1939. Cup; Paper, Holder, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2570; 1939. Holder; Mercury.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-81a; 1936. Sputum Cup Holders.

915.43 Cabinets, Medicine Chests, and Equipment

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 201-S. Kit; Medicine, Veterinarian's.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 205-S. Kit; Medicine, List of Contents.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-205-1. Kit; Medicine, Large-Crew Size.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-205-2. Kit; Medicine, Medium Size.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-209. Kit; Medicine, Individual-Pocket Size.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-209. Kit: Medicine, Snake-Bite Outfit.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 210. Kit; Medicine, Wall or Truck Cab.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 43. Cabinets; Instrument, Hospital.

U. S. Gov., Navy Dept. Specification 57C16; 1941. Chests; Hard-Fiber.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2459; 1938. Container; Metal, Large and Small, for Chest, Medical Pack.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2460; 1938. Insert; Plywood, for Chest, Medical Pack.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2463B; 1941. Chest; Field, Plain, Medical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2464; 1939. Chest; Field, Modified, Medical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2465A; 1940. Chest; Medical Pack.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2471; 1939. Container; Dispensing Set, Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2474; 1939. Case; Diagnostic, Eye, Ear, Nose, and Throat.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2504; 1939. Cabinet; Instrument, Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2509A; 1941. Container; Metal, for Medical Dept. Field Supplies.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2568; 1939. Chest; Flight Service.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2676; 1939. Cabinet; Medicine, Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2739; 1939. Cabinet for X-Ray Films.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2896A; 1941. Cabinet; Specialists' Ear, Nose, and Throat, Suction and Pressure.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2989; 1941. Chest; Film, X-Ray Field Unit, Superseding 10-2463A; for Item 96025 Only.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2997; 1941. Cabinet; Medicine.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3002; 1942. Cabinet; Instrument.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-41c; 1942. Instrument Cabinet, Single Door Type.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-42b; 1939. Instrument Cabinet for Oral Surgery.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-43e; 1941. Medicine Cabinet, Desk Type.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-44c; 1942. Physicians' Office Cabinets.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-88c; 1942. Straight Type Instrument Cabinet.

References.—Sterilizers, dressing containers, and portable lockers, *see* 613.5, 915.32.

915.44 Funnels and Graduates

U. S. Gov., Treasury Dept., Procurement Div., No. 528, 1941. Enamelware; Hospital and Sickroom. Covers twenty types and a number of classes intended to include all kinds of enamelware vessels for hospital sickroom use. Color generally white. Gives requirements for material, thickness of metal, thickness of enamel, capacity, dimension, handles, ears, bail, finish, impact resistance, solubility, welds, processing, trade mark, and pouring lips; methods of sampling, inspection, and tests; packaging, packing, and marking.

References.—Laboratory funnels and graduates, *see* 918.2.

915.45 Medicine Droppers and Glasses

American Hospital Assn., 70-13. Medicine Glasses. Covers one type, one grade, and one class. Based on U. S. Gov. Federal Specification DD-G-616.

U. S. Gov., Federal Specification DD-D-691; 1936. Droppers; Medicine. Covers one grade and two types—curved and straight. Gives detail requirements; methods of sampling and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DD-G-616; 1936. Glasses; Medicine. Covers one type, one grade, and one class. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

915.46 Stands, Trays, and Carriers

American Hospital Assn., 70-37. Corrosion-Resisting Steel Instrument Trays. Covers one grade in three sizes.

U. S. Gov., Federal Specification RR-T-626; 1941. Trays; Catheter, Corrosion-Resisting Steel (With Cover). Covers one grade and two types—(A) deep, with cover, and (B) shallow, with cover. Gives requirements for material, workmanship, design, and construction; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-T-636; 1940. Amendment 1; 1944. Trays; Instrument, Corrosion-Resisting Steel. Covers one type, one grade, and seven sizes. Gives requirements for material, workmanship, construction, design, measurements, tolerances, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57S1b; 1939. Stands; Instrument and Dressing, Operating Room.

U. S. Gov., Treasury Dept., Procurement Div., No. 528; 1941. Enamelware; Hospital and Sickroom. Covers twenty types and a number of classes intended to include all kinds of enamelware vessels for hospital sickroom use. Color generally white. Gives requirements for material, thickness of metal, thickness of enamel, capacity, dimension, handles, ears, bail, finish, impact resistance, solubility, welds, processing, trade mark, and pouring lips; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2026A; 1941. Basket; Culture Tubes.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2037A; 1941. Section Lifter; Pathological.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2282A; 1941. Stand; Support.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2400A; 1939. Tray; Instrument.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2409A; 1942. Stand; Irrigator.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2466A; 1941. Tray Set; Type 3.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2467; 1939. Tray Set; Type 5, Dental.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2503A; 1940. Tray Set; Type 1, Medical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2518; 1939. Stand; Bowl, Immersion.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2559; 1939. Ring Support Stand.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2831; 1939. Carrier; Food.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2919B; 1941. Stand; Irrigator, Folding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2932; 1939. Tray No. 6; Plain, Medical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2933; 1939. Tray No. 7, for Sterilizer; Medical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2975; 1940. Tray Set; Types 4 and 6.

U. S. Gov., U. S. Army, Medical Dept. Specification 23-95A; 1942. Tray; Bed.

U. S. Gov., U. S. Army, Medical Dept. Specification 23-96; 1939. Tray; Butlers'.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-13-A; 1942. Tray; Serving.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-35e; 1942. Utensil Stand, Wall Type.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-48b; 1943. Double Form Basin Stand.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-49c; 1942. Single Form Basin Stand.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-50; 1932. Triple Form Basin and Immersion Stand.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-51e; 1942. Mayo Instrument Stand.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-65a; 1939. Immersion Bowl and Stand, Double.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-73a; 1938. Soiled Linen Conveyors.

U. S. Gov., Veterans Administration. Specification VA-X-20h; 1943. Bases; Wooden Tray.

915.47 Urinals, Bedpans, Commodes, and Racks

American Hospital Assn., 10-16. Corrosion-Resisting Steel Bedpans. Covers one grade and one type.

American Hospital Assn., 70-40. Graduated Glass Male Urinals. Covers one type and grade. Based on U. S. Gov. Federal Specifications DD-U-686a.

U. S. Gov., Federal Specification DD-U-686a; 1941. Urinals; Glass, Male, Graduated. Covers one size, one type, and one grade. Gives detail requirements; methods of sampling and testing; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification RR-B-191; 1940. Bedpans; Corrosion-Resisting Steel. Covers one type, grade, and style. Gives requirements for material, composition, construction, design, measurements, tolerances, finish, and marking; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-U-691; 1940. Urinals; Male, Corrosion-Resisting Steel. Covers one grade, type, and capacity. Gives requirements for material, workmanship, construction, finish, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 528; 1941. Enamelware; Hospital and Sickroom. Covers twenty types and a number of classes intended to include all kinds of enamelware vessels for hospital sickroom use. Color generally white. Gives requirements for material, thickness of metal, thickness of enamel, capacity, dimension, handles, ears, bail, finish, impact resistance, solubility, welds, processing, trade mark, and pouring lips; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2397A; 1944. Bedpan.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2564; 1939. Rack for Urinals.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2730; 1939. Urinal; Enamelware.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2742; 1939. Pot; Chamber.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2827; 1939. Commode.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-94a; 1939. Commode Chair Without Bedpan.

References.—Stationary urinals of vitreous ware, *see* 532.23.

915.5 MEDICAL AND HOSPITAL SUPPLIES

915.50 General Items

915.51 Surgical Dressings

American Hospital Assn., 13-1. Canton Flannel Bandage. Covers one type, one grade, and two sizes—3 in. and 5 in.

American Hospital Assn., 13-31. Orthopedic Webbing. Covers one type, one grade, and 3 sizes — 1 in., 1 1/2 in., and 2 in.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R178-41; 1941. Packaging of First-Aid Unit Dressings and Treatments. This recommendation was designed to simplify the packaging of first-aid unit dressings and treatments and thereby to simplify the maintenance of industrial first-aid kits. Sponsored by Industrial Safety Equipment Assn.

U. S. Gov., Federal Specification L-C-166; 1942. Cellulose; Absorbent, Surgical. Covers one type and one grade in rolls or flat packages of 2, 5, or 8 lb. Gives requirements for material, workmanship, absorbency, water-soluble substances, ash, size, weight, moisture, and groundwood and unbleached pulp; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3001; 1941. Fabric; Impervious, for Surgical Dressings.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-116a; 1941. Cellulose Padding.

References.—Absorbent cotton, gauze, surgical dressings, *see* 398.1, 398.2, 398.3.

915.52 First-Aid Supplies

American Hospital Assn., 37-1. Basswood Splints. Covers one type, one grade, and two sizes—18 in. and 5 to 10 ft.

American Hospital Assn., 37-4. Thomas Hinged Arm Splint. Covers one type, grade, and class.

American Hospital Assn., 37-7. Thomas Leg Splint. Covers one type, grade, and class.

U. S. Gov., Federal Specification GG-K-391; 1941. Amendment 1; 1944. Kits; Empty, First-Aid, Burn-Treatment, and Snake-Bite; and Kit Contents. Covers two types—(I) pocket and (II) cabinet-carrying; two classes—(A) standard and (B) airtight and watertight; and two grades—(A) sheet metal and (B) nonmagnetic metal. Gives requirements for material and workmanship, unit size packages, compression, sterilization, waterproof, finish of kits, marking, instruction sheets, contents of kits, test specimens, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-K-87; 1944. Kits; First-Aid, for Life Rafts.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2056D; 1941. Packet; First Aid, Carlisle Model, Metal Covered.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2058B; 1940. Dressings; First-Aid, Large and Small.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2543; 1939. First-Aid Packet, for Instruction.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2576; 1939. Splint; Wrist, Cock-Up.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3010; 1944. Packages; First-Aid, Unit Size.

References.—*See* references under 915.51.

915.53 Medicinal and Pharmaceutical Preparations

References.—Standard unit list of supplies, *see* 915.50; medicinal and pharmaceutical preparations, *see* 810-819.

915.54 Napkins

915.55 Surgical Silk and Tape

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Sterile Surgical Silk. Description, tensile strength, sterility, labeling, and storage.

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Surgical Silk. Description, length, diameter, tensile strength, labeling, and storage.

References.—Adhesive tape, *see* adhesive plaster under 204.12.

915.56 Suture Material

U. S. Pharmacopoeial Convention. Pharmacopoeia of U. S. A., Twelfth Revision, 1942. Surgical Gut (Surgical "Catgut," "Catgut" Suture). Description, length, diameter, tensile strength, soluble chromium compounds, sterility, labeling, and storage.

U. S. Gov., Federal Specification GG-S-816; 1944. Sutures; Surgical, Silk and Nylon. Covers four types—(I) braided, (II) dermal, (III) monofilament, and (IV) twisted; two grades—(A) silk and (B) Nylon; three colors—(W) white, (B) black, and (C) colored; containers; treatment; and sizes. Gives requirements for material and workmanship, control (lot) numbers, general characteristics, impregnation, labels, tolerances, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57C13; 1941. Clips; Suture, Metal.

U. S. Gov., Navy Dept. Specification 57G3; 1940. Gut; Surgical.

U. S. Gov., Navy Dept. Specification 57S51; 1944. Sutures; Corrosion-Resisting Steel Alloy Wire.

U. S. Gov., Navy Dept. Specification 57S63; 1944. Sutures; Silver Wire.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2041A; 1941. Needle Holder; Kolle.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2702; 1939. Suture; Tape, Cotton.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2733; 1939. Case; Nasal, Suture.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2790A; 1940. Tape; Suture, Cotton, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2897; 1939. Sutures; Silkworm Gut.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2973A; 1941. Suture; Silk, Braided.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2985; 1941. Suture; Catgut, U. S. Pharmacopoeia Quality.

915.57 Absorbent Cotton

References.—Absorbent cotton, *see* 398.1.

915.58 Bone Plates

American Hospital Assn., 37-10. Sherman Steel Bone Plates and Screws. Covers one type, grade, and class of 14 bone plate sizes and 11 sizes of bone screws. Based on U. S. Gov., War Dept. Specifications 10-2072 D and National Bureau of Standards, Commercial Standard CS37-31.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commerical Standard CS37-31; 1931. Steel Bone Plates and Screws. A commercial standard selected and adopted by industry for Sherman type bone plates made of chromium-vanadium steel, requirements on chemical composition of plates and screws corresponding to S. A. E. steel No. 6150, hardness, dimensions and design of 14 plate sizes and 11 screw sizes. Initiated by the American College of Surgeons.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2072D; 1941. Steel Bone Plates and Screws; Sherman.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2163; 1927. Clamp; Bone Plating, Lowman.

915.59 Miscellaneous Medical and Hospital Supplies

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS 114-43; 1943. Hospital Sheeting for Mattress Protection. To serve as a guide to producers, distributors, and users of sheeting impervious to moisture; used for the protection of hospital mattresses. Gives requirements for thickness, breaking strength, tearing strength, resistance to oil and disinfectants, resistance to sterilization, accelerated aging, cracking and moisture penetration, and burning rate.

U. S. Gov., Federal Specification U-C-115; 1943. Amendment 1; 1944. Capsules (Empty); Gelatin, Pharmaceutical. Covers one type, one grade, and size Nos. 000, 00, 0, 1, 2, 3, 4, 5, 10, and 11. Gives requirements for material, workmanship, shape and construction, capacities of sizes, water resistance, acid solubility, and appearance and color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-P-171; 1943. Pencils; Skin-Making. Covers one grade; two types—(I) single color and (II) two-color combination; and two classes—(A) wood casing and (B) paper casing. Gives requirements for colors, marking mediums, casings, workmanship, instruction sheet, marking, finish, point protector, bid sample, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-S-621; 1944. Splints; Basswood. Covers one type and one grade. Gives requirements for sizes, material, workmanship, wood dimensions, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51D3a; 1944. Dispensers; Salt-Tablet.

U. S. Gov., Treasury Dept., Procurement Div., No. 705; 1944. Masks; Surgeons', Cotton Gauze. Covers one type. Gives requirements for gauze, tape, thread, workmanship, design, mask proper, size, and tape; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40859; 1944. Kit; Carbon Monoxide Blood Testing, Type GG-1.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-69; 1936. Capsule; CN.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2156A; 1941. Splint; Wire Ladder.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2157A; 1939. Splints; Basswood.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2510; 1939. Capsules; Gelatin.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2639; 1939. Capsule; Gelatin, Veterinary.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2696; 1939. Stick; Orangewood.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2866; 1939. Perimeter, Charts; McHardy.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2893; 1939. Pad; Prescription.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2942; 1939. Chain for Bandage Scissors.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2998; 1941. Splint Accessories; Steel.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-3009; 1944. Mask; Face, Surgical, Improved, With Fabric Filter.

916. SURVEYORS' AND ENGINEERS' INSTRUMENTS AND SUPPLIES

916.0 GENERAL ITEMS

American Society of Civil Engineers. Manuals of Engineering Practice, No. 15; 1938. Definitions of Surveying Terms. In order to produce a manual that would be serviceable, but not too bulky, the attempt was made to limit definitions to terms that are ambiguous or doubtful and terms that are comparatively new. In cases where more than one term is used to mean the same thing, the terms and definitions are adopted as the best usage.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-327. Transit; Engineering, 1-Minute, Large.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-372. Transit; Engineering, Small.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-380. Level; Standard Dumpy.

916.1 MATHEMATICAL INSTRUMENTS

U. S. Gov., Army-Navy Aeronautical Specification AN-C-108; 1943. Computers; Balance.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-15; 1927. Rule; Slide, Polyphase, 10-In., With Magnifier, With Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-1; 1921. Rule; Slide, 16-In., With Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-2; 1921. Rule; Slide, 20-In., With Case.

916.2 LENGTH AND ANGLE MEASURING INSTRUMENTS

916.21 Length-Measuring Instruments

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C328; 1927. Testing of Measuring Tapes at the National Bureau of Standards. Includes specifications for standard steel tapes; requirements on placing of graduations; permissible error in length for chosen standard tensions. Method of testing steel tapes with description of bench standard; description of geodetic comparator for testing base-line tapes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard (Emergency) CS(E) 119-45; 1945. Dial Indicators (for Linear Measurements). The purpose is to provide minimum essential requirements for precision dial indicators. Covers four size groups of nominal bezel diameters, type, material, illustrations, dial indicators, dial classes, dial markings (English and metric), dial numbering, repetition of accuracy, repetition of readings, accuracy, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-33; 1939. Chain; Band, 300-Ft., With Reel and Tape Handles.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-34; 1939. Tape; Measuring, Steel, 100-Ft., Graduated in Feet and Meters.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-35; 1939. Tape; Measuring, Steel, 100-Ft., Graduated in Feet, With Thermometer Scale, Tension Handle, and Base Line Thermometer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-36; 1939. Tape; Steel, Pocket, 2-Meter, Graduated in Inches and Meters.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-37; 1939. Tape; Steel, Map, Graduated in Yards, 1/20,000.

References.—Caliper rules, carpenters folding rules, steel rules, wood rulers, *see* 616.33; railway wheel measuring tapes, *see* 616.35; standard linear measures, *see* 919.1.

916.22 Angle-Measuring Instruments

U. S. Gov., Army Air Forces. Specification 27473 (3); 1944. Sextant; Aircraft, Type A-10 (Bubble Type).

U. S. Gov., Army Air Forces. Specification No. 40834; 1944. Trainer; Sextant, Type V-1.

U. S. Gov., Army-Navy Aeronautical Specification An-C-96; 1944. Collimators; Sextant.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-28; 1943. Sextants; Bubble Type (With Altitude Averaging Device).

U. S. Gov., Army-Navy Aeronautical Specification AN-S-29; 1944. Sextants; Median Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Protractor; Paper, Glassine, or Opaque.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 2. Alidade; Vertical-Angle.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 268-1. Protractor; Dispatcher, Metal.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 269. Protractor; Smoke Chaser's, Transparent.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 377. Triangulator; Parallel, Transparent.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-1. Alidade; Pivot-Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-2-1. Alidade; 18-In., Plain Base.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-2-2. Alidade, 12-In., Plain Base.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 31. Theodolites; 10 Seconds, 7 Inches.

U. S. Gov., Joint Army-Navy Specification JAN-C-167; 1944. Clinometers (Mark 4).

U. S. Gov., Marine Corps Specification, 1941. Protractors; Xylonite, Semicircular, 6-In., Graduated in Degrees.

U. S. Gov., Navy Dept. Specification 18A4; 1944. Alidades; Telescopic.

U. S. Gov., Navy Dept. Specification 18C12c; 1944. Circles; Azimuth, Mark 111, Model 2.

U. S. Gov., Navy Dept. Specification 18P7; 1943. Protractors; Position-Ploting, Hoey.

U. S. Gov., Navy Dept. Specification 18S6b; 1931. Sextants; Surveying.

U. S. Gov., Navy Dept. Specification 18S11a; 1943. Stadimeters.

U. S. Gov., Navy Dept. Specification 18S14c; 1944. Sextants; High Grade, Endless Tangent Screw, Mark II.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-2; 1921. Alidade; Brass, Open Sight, With Level Bubble and Declinator, Complete With Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specifica-42.1-47; 1921. Sextant; Pocket, With Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-13-A; 1934. Clinometer; Service, With Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-17; 1928. Alidade; Telescopic, Complete.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-31; 1938. Alidade; Boxwood, Flat, Folding Sights, With Leather Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-32; 1938. Alidade; Boxwood, Triangular, 8 1/2-In.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-39; 1939. Compass; Lensatic, With Leather Case.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-1-D; 1940. Theodolite; Type ML-47-( ), and Tripod; Type ML-78-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 75-32D; 1942. Theodolite; Type PH-( )-33, Associated Equipment.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-8; 1944. Sextants; Endless-Tangent Screw, Precision. Covers one grade. Gives requirements for materials and workmanship, construction, frame, graduated arc, rack, index arm, tangent screw and micrometer drum, telescope, mirrors, shade glasses, pivot, handle, errors, weight, marking, finish, case, accessories, interchangeability of parts, and spare parts; inspection, sampling, and methods of test; and packaging, packing, and marking for shipment.

916.4 GAGES (EXCEPT INDUSTRIAL)

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-5; 1922. Gage; Tide.

916.5 TRANSITS

U. S. Gov., Dept. of Interior, General Land Office. Specification for General Land Office Solar Transit; 1941. Includes requirements for light mountain engineers' transit, with full vertical circle and Smith solar attachment, adapted to the public-land subdivisional surveys.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 19. Transit and Tripods; 20 seconds.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 20. Transit and Tripods; 30 Seconds.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 30. Transits and Tripods; 1 minute.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-15A; 1931. Transit; Engineers', Complete.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-27; 1937. Rod; Stadia, 12-Ft., Folding.

916.6 LEVELS (OTHER THAN CARPENTERS')

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-16A; 1931. Level; Dumpy Engineers', Complete.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-28; 1937. Rod; Level, Philadelphia.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-59; 1943. Level; Hand, Locators.

916.7 CHESTS AND KITS

916.8 PLANE-TABLE OUTFITS

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 132. Fire Finder Map Board Table.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-21; 1929. Plane Table; Complete, With Board, Etc.

916.9 MISCELLANEOUS INSTRUMENTS

U. S. Gov., Army-Navy Aeronautical Specification AN-A-14; 1943. Astrographs.

U. S. Gov., Navy Dept. Specification 18-I-7; 1942. Indicators; Position-Angle (Inclinometers), for Binoculars for Lookout.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-5; 1921. Arrow; Steel, 10 In., Set of 11.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-37; 1921. Pole; Ranging, Surveyors' Rods, Metal, Tubular, in two Sections, Maximum Graduation 6 Ft., Complete With Case.

917. METEOROLOGICAL INSTRUMENTS

917.0 GENERAL ITEMS

American Society for Testing Materials, D 337-34; 1934. Method of Determining Relative Humidity. Definitions for absolute humidity, relative humidity, dew point, vapor pressure, dry and wet bulb temperatures, hygrometer, psychrometer, etc.; description of standard sling psychrometer, alternate instruments, method of procedure, and formulas for calculations of results.

917.1 ANEMOMETER AND WIND VANES

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-32. Windcone-Assembly; Internally Lighted.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-507. Weather Instruments; Wind Direction and Velocity.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-13-A; 1925. Anemometer; Type ML-58.

917.2 BAROMETERS AND BAROGRAPHS

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 2—Pressure Measurement, Chapters 1 and 6; 1941. Chapter 1 considers types of barometers; methods of obtaining barometric pressure; range and accuracy of barometers; installation; barometric corrections and reductions; and calibration, etc. Chapter 6 presents information on standard conditions for mercury columns; standard barometric pressure for condensers, engines, and turbines; barometric temperature; temperature corrections; temperature-correction formula; corrections for barometers and pressure gages for decrease of atmospheric pressure with elevation; gravity corrections; data for computing pressures above atmospheric; corrections for head and water columns; density of water and multipliers for water columns; formulas for pressure equivalents of velocity heads; computation of total pressure; formulas for pressure loss due to pipe friction, for friction loss in terms of velocity, and in terms of impact tube reading.

U. S. Gov., Army Air Forces. Specification 27397-1; 1943. Barograph; Type B-2, Aircraft.

U. S. Gov., Army Air Forces. Specification 27989 (1); 1942. Barometer; Laboratory (Altitude Test).

U. S. Gov., Joint Army-Navy Specification JAN-B-84; 1944. Barometers; Mercurial, Marine.

U. S. Gov., Navy Dept. Specification 18B1d; 1944. Barometers; Aneroid.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-6; 1921. Barometer; Aneroid, With Case.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-4-B; 1922. Barometer; Type ML-9, Aneroid.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-7-D; 1942. Barometers; Type ML-2 and Case, ML-48.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-25; 1938. Barograph; Type ML-3-A.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-1b; 1943. Barometer; Aneroid. Shall be but one type and grade. Gives requirements for materials, workmanship, construction, and finish; inspection, sampling, and methods of test; and packaging, packing, and marking.

917.3 PSYCHROMETERS, CASE AND SLING

American Society of Mechanical Engineers. Power Test Codes. Ausiliary Section. Part 18—Humidity Determinations, 1932. Contains detailed description and methods of application as well as information on available types of instruments.

American Society for Testing Materials, D 337-34; 1934. Method of Determining Relative Humidity. Definitions for absolute humidity, relative humidity, dew point, vapor pressure, dry and wet bulb temperatures, hygrometer, psychrometer, etc.; description of standard sling psychrometer, alternate instruments, method of procedure, and formulas for calculations of results.

U. S. Gov., Navy Dept. Specification 18P2d; 1943. Psychrometers and Cases.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-17B; 1931. Psychrometer; Type ML-24.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-4; 1941. Hygrometer; Mason's Form. Shall be but one type and one grade. Gives requirements for materials, workmanship, thermometer, reservoir, wicks, scales, panel, mounting, inspection, and test.

917.4 GAGES, METEOROLOGICAL

U. S. Gov., U. S. Army, Signal Corps. Specification 74-9; 1922. Gage; Type ML-17, Rain and Snow.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-60; 1943. Gage; ML-217, Precipitation.

917.5 THERMOMETERS

References.—Testing of thermometers, *see* 919.80.

917.9 MISCELLANEOUS METEOROLOGICAL INSTRUMENTS

U. S. Gov., U. S. Army, Signal Corps. Specification 74-10B; 1941. Hydrograph; Type ML-16, Without Clock.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-11; 1922. Sunshine Recorder; Type ML-20.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-19-A; 1938. Board; Plotting, Type ML-57, Meteorological.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-21A; 1933. Rotor; Type ML-74-A.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-23-A; 1934. Board; Type ML-92, for Meteorological Data.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-24; 1938. Board; Plotting, Type ML-55. Includes Paper Cover and Rules, Type ML-63.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-30B; 1944. Meteorological Scales.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-31-A; 1943. Plotting Boards; ML-120 and ML-122.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-58; 1943. Wind Equipment; SCM-20-( ).

918. LABORATORY APPARATUS AND SUPPLIES

918.0 GENERAL ITEMS

American Ceramic Society. Journal of A.C.S. for June 1928. Tentative Methods. Analysis of Glass, 1926. Preparation and fusion of sample, method of determination of silica, iron and alumina, lime, magnesia, and alkalies.

American Trudeau Society (Medical Section of the National Tuberculosis Assn.). Report of the Committee on Standard Laboratory Procedure Minimum Laboratory Standards, 1942. Covers the minimum which is the least acceptable effort in searching for the tubercle bacillus and includes technical procedures for making the several tests.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C19; 1924. Standard Density and Volumetric Tables. Includes tables of temperature correction for glass volumetric apparatus.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C398 and Supplement, 1944. Standard Samples. Glass, Low Boron, Sample 92; Glass, High Boron, Sample 93; Glass, Lead-Barium, Sample 89; Glass, Opal, Sample 91; Glass, Soda-Lime, Sample 80; and Glass, Soda-Lime (B_2O_3BaO), Sample 128. These samples are prepared and sold by the National Bureau of Standards with a certificate of analysis for use in industry and by others as a comparison standard for checking the accuracy of analysis of similar materials.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C434; 1941. Testing of Glass Volumetric Apparatus. This circular contains specifications and tolerances for glass volumetric apparatus of precision grade. Detailed information is given as to dimensions, type of graduations, inscriptions, and tolerances for Burettes, flasks, cylinders, and certain kinds of special apparatus. Instructions are given for the method of reading, the test liquid used, the method of test, and the importance of cleanliness of apparatus. An outline of the tests performed, reports of test, and directions for submitting apparatus, are included.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS21-39; 1939. Interchangeable Ground-Glass Joints, Stopcocks, and Stoppers. This standard covers interchangeable ground-glass joints for laboratory and industrial glassware in sizes from 5 to 71 mm. approximate diameter at the large end of ground zone for full-length grindings; from 5 to 40 mm. for medium-length grindings; and from 10 to 71 mm. for short-length grindings; interchangeable straight-bore, ground-glass stopcocks from 1- to 10-mm. bore; interchangeable ground-glass stoppers from 9 to 38 mm. approximate diameter at the large end of ground zone for volumetric flasks, stoppered Erlenmeyer flasks, stoppered cylingers, separatory funnels, and iodine determination flasks; and interchangeable ground-glass stoppers from 14 to 45 mm. approximate diameter at the large end of ground zone for reagent bottles. Sponsored by the Vitreous China Plumbing Fixtures Assn. Also printed in Spanish.

918.1 BURETTES AND PIPETTES

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes burettes and pipettes, sizes and capacities selected as standard stock items, no detailed dimensions or specifications.

Manufacturing Chemists Assn. of the U. S. Laboratory Apparatus, 1922. Burettes. For four standard burettes (funnel top; 3-way stopcock; bulb and 3-way stopcock with 50 ml. bulb; bulb and 3-way stopcock with 75 ml. bulb), requirements on general quality and annealing of glass, graduation, construction of stopcocks and burette tips, capacity and design of burette, dimensions, time of outflow, error in capacity, calibration according to National Bureau of Standards methods.

Manufacturing Chemists Assn. of the U. S. Laboratory Apparatus, 1922. Mohr Pipettes. Standard sizes, requirements on general quality and annealing of glass, design, graduation, dimensions, limits of error in graduation, calibration in accordance with methods of National Bureau of Standards.

Manufacturing Chemists Assn. of the U. S. Laboratory Apparatus, 1922. Transfer Pipettes. Standard sizes, requirements on general quality and annealing of glass, dimensions, graduation, accuracy of graduation, calibration according to National Bureau of Standards methods.

U. S. Gov., Federal Specification DD-P-386; 1940. Pipettes; Ostwald. Covers one type, one grade, and six sizes—1/2, 1, 2, 3, 5, and 10 cc. Gives detail requirements for dimensions, tolerance, bulb, lumen, ends, and calibration; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 57P6; 1941. Pipettes; Haemacytometer, Diluting.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2025A; 1941. Burette; Automatic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2372; 1938. Pipette; Babcock, for Milk Test.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-8c; 1938. Blood Diluting Pipettes.

References.—Analysis of glass, volume correction, ground joints, *see* 918.0.

918.2 BEAKERS, GLASSES, GRADUATES, AND FUNNELS

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes beakers, glasses, graduates, and funnels; sizes and capacities selected as standard stock items; no detailed dimensions or specifications.

American Wood-Preservers' Assn. Methods for Determination of Tar Acids, 26b; 1939. Includes specification for graduated glass separatory funnel; dimensional drawings for two types.

Manufacturing Chemists Assn. of the U. S. Laboratory Apparatus, 1922. Graduated Cylinders. For lipped cylinders with foot and for glass stoppered cylinders with foot, standard sizes, requirements on general quality and annealing of glass, design, graduation, diameter of neck of stoppered cylinders, limits of error in graduation, calibration in accordance with methods of National Bureau of Standards.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Glass Graduates. Shall be either cylindrical or conical in shape and made of good quality glass, thoroughly annealed, clear and transparent Specification requirements are given relative to construction and capacities of graduates, as well as allowable tolerances for various diameters.

U. S. Gov., Federal Specification DD-F-796; 1941. Funnels; Glass, Fluted or Ribbed. Covers two classes—(A) fluted (in two sizes—32- and 64-ounce) and (B) ribbed (in five sizes—2-, 8-, 16-, 32-, and 64-ounce). Gives requirements for material, workmanship, bowl, stem, fluting, ribbing, and measurements; methods of sampling, inspection, and tests; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification DD-F-806; 1941. Funnels; Glass, Smooth (Chemical). Covers two classes—(A) short stem, sizes 1 to 11, inclusive; and (B) long stem, sizes 1 to 7, inclusive. Gives requirements for material, workmanship, size, inside diameter, length of stem, and outside diameter; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DD-G-666; 1941. Amendment 1; 1944. Graduates; Glass, Conical. Covers one grade and three types—(I) graduated in metric scale, (II) graduated in apothecaries scale, and (III) graduated in both metric and apothecaries scales. Gives requirements for capacities, material, workmanship, construction, graduation marking, capacity numerals, marking, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DD-V-581; 1937. Amendment 1; 1937. Volumetric Apparatus; Glass. Covers volumetric flasks, burettes, transfer pipettes, measuring pipettes, cylindrical graduates, and serological pipettes—Class A and class B. Gives detail requirements; methods of inspection and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 57B13; 1941. Beakers; Laboratory, Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2012B; 1942. Beaker; 250 Cc.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2253A; 1941. Funnel; Separatory, Squibb.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2264A; 1941. Funnel; Separatory, Cylindrical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2268A; 1941. Measure; Acid.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2273A; 1941. Glass; Test, Urinalysis.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2489B; 1942. Graduate; Aluminum, 60-Cc.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2494; 1939. Graduate; 500-Cc., Enamelware.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2535; 1939. Funnel; Enamelware.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2561; 1939. Beaker.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-8A; 1938. Graduate; Glass, for Photographic Use.

References.—Analysis of glass, volume corrections, ground joints, physical testing methods, *see* 918.0; metal funnels for commercial use, *see* 612.29; Buchner porcelain funnel, *see* 532.21.

918.3 CRUCIBLES, BOTTLES, BRUSHES, AND JARS

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes crucibles and bottles, sizes and capacities selected as standard stock items, no detailed dimensions or specifications.

American Hospital Assn., 43-25. Museum Jars. Covers one type, one grade, and four sizes. Based on U. S. Gov., War Dept., Specification 10-2004A.

American Hospital Assn., 43-28. Specimen Jar. Covers one type, one grade, and three sizes. Based on U. S. Gov., War Dept., Specification 10-2292.

U. S. Gov., Navy Dept. Specification 57B24; 1943. Bottles; Tablet, Wide-Mouth, Screw-Cap, Flint-Glass (for Cases, Tablet, U.S.N.).

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2004A; 1941. Jars; Museum.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2246A; 1939. Bottle; Specific Gravity.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2248A; 1941. Desiccator; Scheibler.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2257A; 1941. Bottle; Weighing.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2262A; 1941. Holder; Crucible, Walter.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2265A; 1941. Jar; Animal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2267A; 1941. Bottle; Testing, Cream and Milk.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2283A; 1941. Jar; Coplin.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2292A; 1941. Jar; Specimen.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2306B; 1941. Bottle; Vaccine.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2368A; 1941. Crucible; Porcelain, High Form.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2371-A; 1939. Bottle; Wide Mouth, With Ground Glass Stopper.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2447; 1938. Bottles; Reagent, 8-oz., Narrow Mouth With Vertical, Coin-Shaped Glass Stopper.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2522; 1939. Jar; Ointment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2525; 1939. Bottle; Office, Preparation.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2655; 1939. Bottle; Narrow Mouth, With Ground Glass Stopper.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2728; 1939. Brush; Camel Hair.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2745; 1939. Brush; Scratch.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2812A; 1941. Vial; 2-Dram.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2828; 1939. Jar for Sutures.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2903; 1939. Vial; Glass, Amber, 60-Cc.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2928; 1939. Vial; Rubber-Stoppered, 6 1/2-Cc.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2964; 1939. Vial; Glass-stoppered, for Container No. 1.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2995; 1941. Vial; Serum.

References.—Porcelain crucibles and other laboratory porcelain ware, *see* 532.21; weighing bottles, tablet bottles, *see* 955.1; laboratory and distillation flasks, *see* 918.9; analysis of glass, volume corrections, ground joints, *see* 918.0.

918.4 BURNERS AND CLAMPS

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes burners and clamps, sizes and capacities selected as standard stock items, no detailed dimensions or specifications.

U. S. Gov., Treasury Dept. Procurement Div., No.577; 1942. Burners; Gas, Laboratory. Covers type I; Regular—class A, Bunsen; class B, Meker (size 1, large; size 2, medium; size 3, small); and class C, Tirrill; and type II; Blast—class A, Bunsen and class B, MIT. Gives requirements for material, control, finish, flame retarder, and dimensions and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2007B; 1939. Burner; Gasoline (Fire Pot Type).

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2008A; 1941. Burner; Bunsen, Tirrill Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2009A; 1941. Burner; Bunsen, High Temperature or Meker.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2010B; 1941. Burner; Bunsen, Blast.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2011A; 1942. Burner; Alcohol, Bunsen Type.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2355A; 1941. Burner; Bunsen, Four Burners, Grouped.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2358; 1939. Burner; Micro.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2366A; 1942. Clamp; Mohr's Pinchcock.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2379; 1939. Clamp; Adjustable.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2380A; 1941. Clamp; Extension.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2381A; 1941. Clamp; Extension, Holder.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2382A; 1942. Clamp; Hoffman, Improved.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2720; 1939. Burner; Bunsen, Laboratory.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2844; 1939. Torch for Prestolite.

918.5 DISHES

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes dishes, sizes and capacities selected as standard stock items, no detailed dimensions or specifications.

American Hospital Assn., 43-16. Culture and Petri Dishes. Covers one type, two grades, and two sizes.

U. S. Gov., Federal Specification DD-D-411; 1941. Dishes; Culture and Petri. Covers two grades—(A) resistance glass (in two classes—(1) ground edges and (2) reinforced edges); and (B) ordinary glass (in one class—(1) ground edges). Gives detail requirements as to sizes, weights, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57D5; 1941. Dishes; Evaporating, Porcelain.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2249A; 1941. Dish; Evaporating, Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2295A; 1942. Dish; Stender.

References.—Porcelain dish, *see* 532.21.

918.6 MORTARS AND PESTLES

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes mortars, sizes selected as standard stock items, no detailed dimensions or specifications.

U. S. Gov., Navy Dept. Specification 57M4; 1942. Mortars and Pestles; Pharmaceutical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2491A; 1939. Mortar and Pestle.

918.7 TUBES AND TUBING

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes tubes and tubing, sizes selected as standard stock items, no detailed specifications.

American Hospital Assn., 43-37. Assorted Test Tubes. Covers three types, two grades, and nine sizes. Based on U. S. Gov., War Dept., Specification 10-2352.

American Hospital Assn., 43-40. Glass Tubing. Covers one type, one grade, and two sizes. Based on U. S. Gov., War Dept., Specification 10-2055B.

U. S. Gov., Navy Dept. Specification 18-T25a; 1942. Tubes; Clinometer, Spirit.

U. S. Gov., Navy Dept. Specification 57T8; 1941. Tubes; Antigen-Dilution, Glass (Kahn).

U. S. Gov., Navy Dept. Specification 57T9; 1941. Tubes; Blood-Sugar, Glass.

U. S. Gov., Navy Dept. Specification 57T10; 1941. Tubes; Centrifuge, Glass.

U. S. Gov., Navy Dept. Specification 57T11; 1941. Tubes; Drip, Glass.

U. S. Gov., Navy Dept. Specification 57T41; 1944. Tubes; Glass, Y-Shaped.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2038A; 1941. Glass Rods.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2055B; 1941. Tubing; Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2067A; 1942. Tubes; Drying, (Calcium Chloride Tubes).

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2259A; 1941. Tube; Glass, 15-Cc., Centrifuge, Graduated and Ungraduated.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2260A; 1941. Tube; Centrifuge, Glass, Ungraduated, 50-Cc.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2274A; 1942. Tube; Color Comparison, Nessler.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2352; 1938. Test Tube; Assorted.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2712; 1939. Tubing; Nickel-Silver.

References.—Rubber tubing, *see* 204.6.

918.8 BIOLOGICAL APPARATUS AND SUPPLIES

918.81 Albuminometers

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2286A; 1941. Albuminometer; Esbach.

918.82 Amboceptors

918.83 Ampules

The American Pharmaceutical Assn. and The National Formulary Committee. The National Formulary, Seventh Edition, 1942. Ampuls. Gives description; methods of cleansing and sterilizing empty glass ampuls; tests for ampul glass; description of aqueous ampul solutions and of ampul water; clearness of ampul solutions; reaction of ampul solutions; proper use of substances suitable as local anesthetics, or as buffers, or as preservatives in ampul solutions; preparation of ampul solutions or suspensions with ampul oil; description of ampul oil; description of filling of ampuls; volume in each ampul; promptness of sterilization of ampul solution; sterilization of filled ampuls; sterilization processes; testing of ampul solutions for sterility; preparation of culture medium; general sterility tests; sterility tests on bulk products and on solutions in ampuls.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2288A; 1944. Ampuls; Glass, for Vaccine.

918.84 Chlorinators

U. S. Gov., Joint Army-Navy Specification JAN-C-97; 1944. Chlorination-Outfits, for Making Water Safe To Drink; Shipboard Use.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2811; 1939. Apparatus; Chlorinating.

918.85 Incubators, Biological

U. S. Gov., Federal Specification GG-I-488; 1944. Incubators; Bacteriological, Air-Circulating Type. Covers one type and four classes—(A) exterior and interior walls of asbestos transite board, (B) exterior walls of steel and interior walls of asbestos transite board, (C) exterior walls of wood and interior walls of asbestos transite board, and (D) exterior and interior walls of steel. Gives requirements for sizes, general construction, cabinets, hardware, insulation, shelves, electric heating medium, gasoline heating medium, ventilation, marking, spare parts, finish, and details for each class and size; methods of inspection and test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2013C; 1941. Incubators; Bacteriological.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2014A; 1939. Incubator; Field Model.

918.86 Haemacytometers

U. S. Gov., Navy Dept. Specification 57C14; 1941. Chambers; Blood-Counting, Glass, for Hemacytometer.

U. S. Gov., Navy Dept. Specification 57H9; 1944. Hemacytometers; Microscopical, Complete, in Carrying Case.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2024B; 1941. Hemacytometer; Complete, and Component Parts.

References.—Analysis of glass, *see* 918.0.

918.87 Spatulas

Manufacturing Chemists Assn. of the U. S. Laboratory Apparatus, 1922. Porcelain Spatula. Requirements on general quality of porcelain for long spatula with knob at opposite end, standard sizes and dimensions, tolerance on capacity, test requirements for resistance to rapid heating and cooling, resistance to hot alkalies, freedom from porous surface, and softening at high temperatures, to be entirely glazed.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes recommendations for shape of bone spatula used in spotting department.

U. S. Gov., Navy Dept. Specification 57S11; 1940. Spatulas; Pharmaceutical.

U. S. Gov., Navy Dept. Specification 57S19; 1941. Spatulas; Hard-Rubber (Pharmaceutical).

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2102A; 1942. Spatula; Abdominal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2168A; 1942. Spatulas; Surgical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2456A; 1940. Spatula; Wax, Dental

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2517; 1939. Spatula; Flexible.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2565A; 1942. Spatula; Brain, Cushing.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2579; 1939. Spatula; Stellite.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2962; 1939. Spatula; Cement, Dental.

918.9 MISCELLANEOUS LABORATORY APPARATUS AND SUPPLIES

American Chemical Society. Standard Sizes and Shapes of Apparatus, 1927. Includes absorption bulbs and tubes, adapters, alkalimeters, annealing cups, ball mills, baskets, baths, calcium chloride tubes, capsules, casseroles, centrifuge tubes, color comparison tubes, combustion tubes and boats, condensers, cylinders, desiccators, distilling tubes, extraction apparatus, filter paper, flasks, funnel tubes, gas analysis apparatus, lecture apparatus, potash bulbs, rubber tubing, spatulas, stop cocks, sulphur apparatus, supports, tongs, triangles, urine analysis apparatus, weighing bottles. Sizes and capacities selected as standard stock items; no detailed dimensions or specifications.

American Hospital Assn., 43-19. Miscellaneous Laboratory Flasks. Covers six types and one grade. Based on U. S. Gov., War Dept., Specification 10-2418A.

American Society for Testing Materials, D 270-33; 1933. American Petroleum Institute Standard, 528-33. American Standards Assn., Z11.33-1935. Methods of Sampling Petroleum and Petroleum Products. Includes all petroleum products except gases. Requirements for experienced personnel and description of apparatus; for bottle or beaker sampling of tank cars and trucks; and shore, ship, or barge tanks, continous sampling of pipe lines, dipper sampling of streams; thief sampling of cans, drums, and tank cars; borings sampling of wax, soft solids in cases, cakes, bags, or barrels; and grab sampling of lumpy material in bins, bunkers, sacks, and barrels.

American Society for Testing Materials, D 635-44; 1944. Method of Test for Flammability of Plastics Over 0.050 Inch in Thickness. Covers the procedure for determining the flammability of plastics in the form of sheets or plates. Apparatus, test specimens, procedure, and report.

American Society for Testing Materials, D 647-42 T; 1942. Tentative Specifications for Molds for Test Specimens of Molding Materials Used for Electrical Insulation. Molds for 1/2 by 1/2 by 5 in. specimen and disk test specimen.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-430. Octane Testing Machine.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS21-39; 1939. Interchangeable Ground-Glass Joints, Stopcocks, and Stoppers. This standard covers—(1) interchangeable ground-glass joints for laboratory and industrial glassware in sizes from 5 to 71 mm. approximate diameter at the large end of ground zone for full-length grindings, from 5 to 40 mm. for medium-length grindings, and from 10 to 71 mm. for short-length grindings; (2) interchangeable straight-bore, ground-glass stopcocks from 1- to 10-mm. bore; (3) interchangeable ground-glass stoppers from 9 to 38 mm. approximate diameter at the large end of ground zone for volumetric flasks, stoppered Erlenmeyer flasks, stoppered cylinders, separatory funnels, and iodine determination flasks; and (4) interchangeable ground-glass stoppers from 14 to 45 mm. approximate diameter at the large end of ground zone for reagent bottles. Also printed in Spanish.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M114; 1931. Filters for the Reproduction of Sunlight and Daylight and the Determination of Color Temperature. The paper contains 33 figures and 26 tables giving among other things the energy distributions and fundamental spectrophotometric and colorimetric data used in the computations, auxiliary spectrophotometric and colorimetric information obtained during the investigation, and the trilinear coordinates of the various source-and-filter combinations and of the Planckian radiator from 1,600° to 20,000° K. computed on the basis of the adopted mean sun as the "neutral" stimulus. The filters are further described in 38 charts, each chart giving the chemical formula, the spectral transmission, and the light transmission of the filter, as well as the spectral energy distribution of the source, that of the source and filter combined, and the energy distribution which serves as the ideal in that particular case.

U. S. Gov., Federal Specification GG-C-191; 1944. Centrifuges; Hand. Covers one type, grade, and class. Gives requirements for material, workmanship, general description, driving mechanism, base, head, tube shields, sedimentation tubes, finish, and marking; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-S-801a; 1944. Support; Laboratory Apparatus. Covers the conventional three ring type, consisting of a base, supporting rod, and three rings, and shall be but one grade and class. Gives requirements for material, workmanship, base, supporting rod, rings, finish, and marking; methods of sampling and inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-U-681; 1942. Urinometers; Squibb. Covers one grade and class of the Squibb type. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57C17; 1941. Centrifuges; Electric.

U. S. Gov., Navy Dept. Specification 57C18; 1941. Condensers; Water-glass for Laboratory Use.

U. S. Gov., Navy Dept. Specification 57M2; 1941. Measures; Seidlitz-Powder.

U. S. Gov., Navy Dept. Specification 57R2; 1941. Rods; Stirring, Glass, Solid, Pharmaceutical.

U. S. Gov., Navy Dept. Specification 57S12; 1941. Stills; Water, Portable.

U. S. Gov., Navy Dept. Specification 57S22; 1941. Stills; Water, Electric.

U. S. Gov., Navy Dept. Specification 57T6a; 1944. Testing Outfits; Dissolved-Oxygen.

U. S. Gov., Treasury Dept., Procurement Div., No. 573; 1942. Desiccators; Laboratory. Covers three types—(1) plain, (2) tubulated cover, and (3) tubulated side; each having three classes—(A) 150 mm. diameter, (B) 200 mm. diameter, and (C) 250 mm. diameter. Intended for use as an airtight container for dehydration and keeping in an atmosphere of uniform humidity. Gives requirements for material (glass), construction, container, dimensions, cover, porcelain plate, and pressure resistance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-76A; 1940. Set; Gas Identification, Detonation, M1.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2015B; 1942. Water Bath; Inoculating.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2016A; 1941. Water Bath; Serlogical, Field Model.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2017B; 1944. Turbidimeter, Colorimeter.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2030A; 1941. Counting Apparatus; Wolfhuegel.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2043A; 1941. Ambocepter Paper Cutter.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2045A; 1941. Sternberg Field Outfit.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2046A; 1941. Condensor; Hallock.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2048B; 1941. Microtome.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2051A; 1941. Microscope Lamp Substage.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2271A; 1941. Ring; Suberite.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2296B; 1941. Thimble; Extraction.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2298A; 1941. Colorimeter.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2301A; 1938. Tongs; Crucible.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2302A; 1938. Tripod Iron.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2351A; 1941. Test Tube Support.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2376B; 1941. Percolator; Laboratory, Glass.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2418A; 1938. Flask; Laboratory, Miscellaneous.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2445A; 1941. Centrifuge; Electric.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2473; 1939. Autoclave.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2485; 1939. Slab; Mixing.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2497; 1939. Measuring Device; Alloy-Mercury.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2506A; 1942. Autoclave; Laboratory, Field.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2511A; 1940. Flask, With Cup.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2572; 1939. Hemaglobinometer; Tallquist.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2609; 1939. Centrifuge; Hand.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2615; 1939. Box; Paraffin Embedding.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2623; 1939. Machine; Pill.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2627; 1939. Mold; Suppository.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2680A; 1939. Strop; Microtome, Knife, Laboratory.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2703; 1939. Bead; Glass, Laboratory.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2704; 1939. Blowpipe; Mouth.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2718; 1939. Lamp; Condenser.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2719; 1939. Condenser; Liebig.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2721; 1939. Furnace; Electric, Small.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2743; 1939. Blowpipe; Gas.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2744; 1939. Blowpipe Outfit; Acetylene.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2753; 1939. Tongs; Extension.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2787; 1939. Furnace and Caldron; Portable, 45-Gal.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2829; 1939. Pencil; Camel Hair.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2863A; 1941. Flask; Vulcanizer, Tench-Donham 22C.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2982A; 1941. Centrifuge; Electric, Small.

References.—Analysis of glass, volume corrections, ground joints, physical testing methods, *see* 918.0; methods of sampling and testing clay and clay products, *see* 531.0.

919. MISCELLANEOUS SCIENTIFIC AND LABORATORY APPARATUS

919.1 WEIGHTS AND MEASURES

Society of Automotive Engineers, joint sponsor with American Society of Mechanical Engineers. Inch-Millimeter Conversion for Industrial Use. American Standards Assn., B48.1-1933. For industrial use 1 in. = 25.4 mm. in the conversion of inches and millimeters. Rule for number of decimal places retained in conversions for "rounding off" decimal values.

Tables for conversions of decimals and for fractions. Adopted by various technical societies and trade associations.

Technical Assn. of the Pulp and Paper Industry. Calibration of Volumetric Glassware and Analytical Weights. Standard T 608 m-42; 1942. The accuracy of quantitive volumetric analyses depends fundamentally in the accuracy of the volumetric glassware used. Covers volumetric ware, analytical weights, and notes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M121; 1936. Units of Weight and Measure (U. S. Customary and Metric)—Definitions and Tables of Equivalents.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T199; 1921. Method of Precision Test of Large-Capacity Scales. Outlines a scientific and systematic method used by the Bureau for testing railroad master and grain hopper scales; includes means for accurately measuring the position of the beam.

References.—Scales and balances, *see* 793.5; liquid measuring devices, *see* 793.6; milk bottles, lubricating oil bottles, *see* 955.1.

919.2 AERONAUTICAL INSTRUMENTS

References.—Aeronautical instruments, *see* 724.26.

919.3 COMPASSES

American Institute of Electrical Engineers. Recommended Practice for Electrical Installations and Shipboard, No.45; 1940. Addenda, 1942, and Emergency Modification and Supplement, 1943. Gyro Compass Equipment and Gyro Pilot. Includes master compass, repeaters of various types, motor-generator, switchboard, alarm circuit, installation and location, automatic and manual control of steering, two unit, and electric steering engine types, wiring, and spare parts.

U. S. Gov., Army Air Forces. Specification 27457-A; 1944. Compass; Pilot's, Type B-20 (Aircraft).

U. S. Gov., Army Air Forces. Specification 27464; 1943. Compass; Pocket, Type H-1.

U. S. Gov., Army Air Forces. Specification 27471-2; 1944. Compass; Pilot's Standby, Type B-21, Aircraft.

U. S. Gov., Army Air Forces. Specification 27610-1; 1945. Compass; Liquid Filled, Type H-2, With Match Container.

U. S. Gov., Army-Navy Aeronautical Specification AN-A-6a; 1944. Amplifiers; Gyro Flux Gate Compass.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-79-1; 1943. Compasses; Pilot's Card Type, Magnetic.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-81-2; 1943. Compasses; Pilot's Glass Bowl, Card Type, Magnetic.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-92-2; 1944. Compasses; Astro.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-98; 1944. Compasses; Top Reading.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-101a; 1944. Compasses; Match Box.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-106; 1943. Compass Swinging; Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-107-1; 1944. Compasses; Installation of.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-116-1; 1944. Compass Liquid; Aircraft.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-C-555a; 1944. Compasses; Gyro Flux Gate.

U. S. Gov., Army-Navy Aeronautical Specification AN-GG-C-566a-1; 1944. Compasses; Remote Indicating, Magnetic.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-16. Attachment; Box-Pocket Compass to Shovel Handle.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-100. Compass; Box Pocket.

U. S. Gov., Marine Corps Specification, adopted, 1942. Compass; Marching, With Case.

U. S. Gov., Navy Dept. Specification 18 C 1 c; 1944. Compasses; Ship, Navy Standard No.1, magnetic, 7 1/2-In. Card.

U. S. Gov., Navy Dept. Specification 18C14; 1932. Compasses; Boat, Navy Standard No.3, Magnetic, 5-In. Card, With Compensating Binnacle.

U. S. Gov., Navy Dept. Specification 18C15; 1932. Compasses; Boat, Magnetic, 4-In. Card, With Binnacle.

U. S. Gov., Navy Dept. Specification 18C17b; 1943. Compasses; Ship, Navy Standard No.2, Magnetic, 6 3/4-In. Card.

U. S. Gov., Navy Dept. Specification 18M1a; 1932. Magnetic Sets; Compass Outfit.

U. S. Gov., Navy Dept. Specification 18P3b; 1932. Peloruses; Illuminated and Nonilluminated.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-14; 1927. Compass; Watch,

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-22; 1921. Compass; Prismatic, With Case.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-9a; 1944. Compasses; Magnetic, Liquid-Filled, Mariners', Compensating, With Mounting for Lifeboats. Gives requirements for materials, workmanship, construction, performance requirements, physical requirements, finish, and marking; inspection, sampling, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-10; 1944. Peloruses; Wheelhouse, Portable, Non-Illuminated. Covers one type and grade. Gives requirements for materials, workmanship, construction, performance, outer ring, pelorus dial, horizontal bar, sighting vanes, indicators, pivot post, leveling weight, clamping screws, spirit level, gimbals, mounting brackets, screws, interchangeability of parts, finish, markings, and stowage case; inspection; and packaging, packing, and marking for shipment.

References.—Radiocompass, *see* 718.66.

919.4 HYDROMETERS

American Society for Testing Materials, D 287-39; 1939. American Petroleum Institute Standard, 526-39. American Standards Assn., Z11.31-1939. Method of Test for Gravity of Petroleum and Petroleum Products by Means of the Hydrometer. Covers the determination of the specific gravity and the A.P.I. gravity of crude petroleum and petroleum products normally handled as liquids. The determination of the gravity of mixtures of petroleum products with other substances is treated as a special case owing to the fact that the coefficient of expansion of such mixtures may not be the same as those of petroleum or its products. The determination of the specific gravity of road oils, road tars, asphalt cements, and soft tar pitches is covered by the Standard Method of Test D 70 of the American Society for Testing Materials, and the testing of these products is, therefore, specifically excluded from the scope of this method.

U. S. Gov., Army Air Forces. Specification 40863; 1944. Trainer: Mock-Up, Type 0-10, Navigator's Aperiodic Compass.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C16; 1922. The Testing of Hydrometer. Also Circular C19; 1924. Standard Density and Volumetric Tables. For density and specific gravity hydrometers, Baumé hydrometers, hydrometers for sulphuric acid, alcoholometers, saccharimeters, and thermohydrometers. Requirements to be met by instruments being submitted to the Bureau for test and certification, such as standard temperature of test, structural features and materials, inscription regarding use, range of graduation for various liquids, graduation according to tables in C19, permissible errors.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Technologic Paper T115; 1918. Adopted by Manufacturing Chemists Assn. of the U. S., the National Bureau of Standards, and by all American manufacturers of hydrometers. New Baumé Scale for Sugar Solutions. Scale is based on specific gravity values of Plato, 20° C., and modulus 145. Tables show relation between degrees Brix or percent sucrose, specific gravity, and degrees Baume.

U. S. Gov., Federal Specification GG-H-941; 1940. Amendment 1; 1942. Hydrometers; Syringe, for Lead-Acid Storage Batteries. Covers three classes—(A) with both specific gravity indicating floats and thermometers as an integral part of instrument, (B) with specific gravity indicating floats and separate thermometers, and (C) without thermometers. Gives requirements for material and workmanship and details for each class; methods of sampling, inspection, and test; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-T-241; 1944. Testers; Antifreeze Solutions. Covers one grade; two types—(I) combination and (II) single; and three classes—(A) alcohol, (B) methanol, and (C) ethylene glycol. Gives requirements for material, workmanship, rubber fittings, glass parts, marking, identification, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 18 S 18; 1943. Salinometers and Salinometer Pots, for Use With Low-Pressure Evaporators.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2284A; 1941. Hydrometer for Liquid Heavier and Liquid Lighter Than Water.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-271; 1943. Hydrometer; photographic.

919.5 MANOMETERS

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 4—Head Measuring Apparatus, 1933. Apparatus described includes float gage, flat plate and rod gage, water column, hook gage, stilling box, dial pressure gage, and manometers.

U. S. Gov., Navy Dept. Specification 18M2c; 1943. Manometers; Aneroid.

919.6 NAUTICAL INSTRUMENTS

U. S. Gov., Navy Dept. Specification 18C7c; 1931. Chronometers; Ships'.

U. S. Gov., Navy Dept. Specification 18C16a; 1942. Circles; Bearing, Mark I, Model II.

U. S. Gov., Navy Dept. Specification 18C21; 1944. Calculators; Distance-Speed-Time, Navigational.

U. S. Gov., Navy Dept. Specification 18G3b; 1944. Gages; Depth and Draft.

U. S. Gov., Navy Dept. Specification 18H2; 1923. Horizons; Artificial.

U. S. Gov., Navy Dept. Specification 18M6a; 1942. Machines; Sounding, Navigational, Hand-Driven.

U. S. Gov., Navy Dept. Specification 18S12a; 1943. Scales; Measuring, Sounding Machine.

U. S. Gov., Navy Dept. Specification 18S16; 1935. Machines; Sounding, Motor-Driven.

U. S. Gov., Navy Dept. Specification 18S16; 1935. Sounding Machines; Motor-Driven.

U. S. Gov., Navy Dept. Specification 41-I-5b; 1945. Indicators; Test, Dial, and Indicator Sets.

U. S. Gov., Navy Dept. Specification 61-I-1; 1943. Instruments; Gyro Compass, Rotor Balancing.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-5; 1944. Protractors; Navigational. Covers one type, grade, and size in two compositions—(A) methyl methacrylate resin and (B) vinyl chloride-vinyl acetate copolymer. Gives requirements for material, workmanship, body, thickness, accuracy, identification, folder, and details for each composition including graduations and markings, light transmission and haze value, warpage, flexibility, and indentation hardness; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

References.—Sextant for marine use, *see* 916.22; radiocompass, *see* 718.66; ship details and equipment, *see* 725.4.

919.7 THERMOGRAPHS AND HYDROGRAPHS

919.8 THERMOMETERS AND PYROMETERS

919.80 General Items

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering. Specifications for Buildings for Railroad Purposes: Steel, Iron, Brick, and Reinforced Concrete Chimneys. Gives requirements for pyrometer.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 3—Temperature Measurement, Chapters 1,5,6, and 7; 1931. Describes and illustrates the pyrometric cones, liquid-in-glass thermometers, and Bourdon tube thermometers.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 3—Temperature Measurement, Chapter 2; 1936. Describes types of radiation pyrometers. Discusses specific instruments, calibration, and installation.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 3—Temperature Measurement, Chapter 3; 1940. This chapter deals with some of the important details involved in the design, assembly, installation, and maintenance of noble-base and base-metal thermocouple thermometers. These considerations include—description, classification, and use of equipment, when to use protecting tubes, the design and use of selector switches, description and use of millivoltmeters and potentiometers, materials for extension leads, tolerances, measurement precautions, and calibration.

American Society of Mechanical Engineers. Power Test Code, Auxiliary Section. Part 3—Temperature Measurement, Chapter 8; 1940. Describes optical pyrometers, their range and accuracy, installation, calibration, etc.

U. S. Gov., Army Air Forces. Specification No. 40823; 1944. Tester; Electrical Thermometer, Field and Standard.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C8; 1926. Testing of Thermometers. Regulations covering the testing and certification of thermometers by the National Bureau of Standards for laboratory and working standards, clinical standards, calorimetric, Beckmann, hypsometric, hygrometric, flash point, distillation, and viscometer thermometers, and special low temperature thermometers, for household and meteorological thermometers with scales graduated on the glass stem, also platinum-resistance thermometers and thermocouples within certain ranges. Standard comparison, number and choice of test points, requirements on design, placing of reference point on scale, graduation, material, workmanship, annealing, gas filling, and accuracy to be met before the certificate is given.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C66; 1917. Standard Samples for Thermometric Fixed Points. Description of preparation of pure samples of tin, zinc, aluminum, and copper; their chemical analyses, freezing points, and degree of purity; their use for the standardization of thermocouples, platinum-resistance thermometers, pyrometers, precautions in their use, prices.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M126; 1937. Temperature Interconversion Tables (°C—°F) and Melting Points of the Chemical Elements. Table of melting points of elements and boiling points of some liquids with the values indicated which are used by the Bureau as standard temperatures for calibration of thermometers and pyrometers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M143; 1933. Psychrometric Charts. These charts were developed for use in the determination of the pressure of water vapor from psychrometric observations and are based on the psychrometric formula. In their development it was found that the addition of two scales permitted the accurate evaluation of relative humidity as well. In comparison with the customary double interpolation tables, it has been found that the use of these charts increased the precision and halved the time required.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP767; 1935. Standard Tables for Chromel-Alumel Thermocouples. Tables give the temperature-emf relation of the thermocouples now being manufactured as closely as the wires can be reproduced at the present time.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Research Paper RP768; 1935. Methods of Testing Thermocouples and Thermocouple Materials. This paper describes various methods used for testing thermocouples and thermocouple materials, and the precautions which must be observed in order to attain various degrees of accuracy. In particular, it describes in detail the methods developed and used at the National Bureau of Standards. It also provides some guidance to the reader in the selection of the method which is best adapted to a given set of conditions.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-2; 1941. Thermometers; Shiphold and Utility. Covers types and classes and shall be in but one grade. Gives requirements for materials, workmanship, size, bulb, accuracy, range, inspection, and tests.

919.81 Bath Thermometers

American Hospital Assn., 70-28. Bath Thermometer. Covers one type. Based on U. S. Gov., War Dept., Specifications 10-2171.

U. S. Gov., Treasury Dept., Procurement Div., No. 511; 1941. Thermometers; Bath. Covers one grade and two types: (I) Glass bulb and stem; and two classes—(A) common and (B) with enclosing glass tube; and (II) thermostatic metal. Gives requirements for floating and tolerance; bulb, stem, scale, column, and case or holder for type I; construction, scale, hand, and case or holder for type II; sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2171A; 1941. Thermometer; Bath.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H9g; 1941. Bath Thermometer.

References.— Bath thermometers for chemical and physical testing, *see* 919.82.

919.82 Chemical Thermometers

American Society for Testing Materials, E 1-44; 1944. American Assn. of State Highway Officials, M 93. Specification for A.S.T.M. Thermometers. Covers scope, requirements, type, stem, bulb, graduations, special marking, scale error, standardization, test for permanency of range, and case. A.S.T.M. Emergency Alternate Provision EA-E 1; 1944, affected low cloud and pour test thermometers.

American Society for Testing Materials. E 1-44T; 1944. Tentative Specifications for A.S.T.M. Thermometers. For glass thermometers graduated in centigrade or Fahrenheit degree. Covers type, stem, bulb, graduations, special marking, scale error, standardization, test for permanency of range, case, and gives table showing added requirements.

U. S. Gov., Navy Dept. Specification 18T8c; 1934. Thermometers; Chemical.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-335; 1943. Thermometer; Photographic, Tray.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2033A; 1941. Thermometers; Chemical.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-H-90, 1936. Laboratory Thermometer.

References.—Thermometer fixed points, testing and certification rules, *see* 919.80; analysis of glass, *see* 918.0.

919.83 Clinical Thermometers

American Hospital Assn., 10-64. Clinical Thermometers. Covers maximum self-registering mercury-type with glass stem having lens, front, and white enamel backing, in four classes—Fahrenheit scale, cylindrical bulb; Fahrenheit scale, pear-shaped bulb; centigrade scale, cylindrical bulb; and centigrade scale, pear-shaped bulb. Based on U. S. Gov., Federal Specifications GG-T-311.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS1-42; 1942. Clinical Thermometers. Applies to mamixum self-registering thermometers of the types commonly used for measuring body temperatures. Gives construction, aging, test for permanence of pigment, entrapped gas, hard shakers, accuracy, and retreating index. Initiated by manufacturers; now represented by Thermometer Manufacturers Advisory Committee.

U. S. Gov., Federal Specification GG-T-311; 1933. Thermometers; Clinical. Covers four classes—(A) Fahrenheit scale and cylindrical bulb, (B) centigrade scale and cylindrical bulb, (C) Fahrenheit scale and pear-shaped bulb, and (D) centigrade scale and pear-shaped bulb. Gives requirements for stems, bulbs, mercury, pigment, cases, workmanship, length, stem thickness, scale and numerals, aging, hand shakers, identification, range of scales, and accuracy; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2356A; 1941. Thermometer; Clinical, Veterinary.

U. S. Gov., Veterans Administration, Medical and Hospital Supply Section, VA-HM-1b; 1940. Ward Thermometer.

References.—Thermometer fixed points, testing and certification rules, *see* 919.80; analysis of glass, *see* 918.0.

919.84 Maximum and Minimum Thermometers

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-471. Thermometer; Maximum, U. S. Weather Bureau Standard.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications MSF-472. Thermometer; Minimum, U. S. Weather Bureau Standard.

U. S. Gov., Navy Dept. Specification 18 T 3d; 1944. Thermometers; Maximum and Minimum.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 74-22A; 1943. Thermometers; Maximum and Minimum, for Ammunition Magazines.

919.85 Household Thermometers

U. S. Gov., Treasury Dept., Procurement Div., No. 510; 1941. Thermometers; Household. Covers one grade and two types: (I) Glass bulb and stem, and three classes—(A) metal case, (B) wood back, and (C) metal back; and (II) thermostatic metal. Gives requirements for tolerance and range; bulb, stem or tube, column, scale, range, and case or holder for type I; material, scale, hand, and case for type II; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 517; 1941. Thermometers; Oven. Covers one grade; two types—(I) glass bulb and stem and (II) thermostatic metal. Gives requirements for material, construction, and base; bulb, stem or tube, column, scale, and tolerance for type I; thermostatic unit, hand, scale, and tolerance for type II; methods of sampling, inspection, and tests; and packaging, packing, and marking.

919.89 Miscellaneous Thermometers

American Hospital Assn., 70-31. Dairy Thermometer. Covers mercury type with glass stem and Fahrenheit scale. Based on U. S. Gov., War Dept., Specifications 10-2690.

American Hospital Assn., 70-34. Ward Thermometers. Covers one type. Based on U. S. Gov., War Dept., Specifications 10-2172.

U. S. Gov., Army Air Forces. Specification 27416 (1); 1943. Thermometer; Type C-17 (Cabin Air, Direct Reading).

U. S. Gov., Army Air Forces. Specification 27498-1; 1944. Thermocouple; Engine Cylinder Bayonet, Type A-1.

U. S. Gov., Army Air Forces. Specification No. 27528; 1944. Indicator; Temperature, Type A-1, Aircraft, Thermocouple Type.

U. S. Gov., Army Air Forces. Specification No. 27529; 1944. Indicator; Temperature, Type A-2, Aircraft, Thermocouple Type.

U. S. Gov., Army Air Forces. Specification No. 27530; 1944. Indicator; Temperature, Type B-1, Aircraft, Thermocouple Type.

U. S. Gov., Army Air Forces. Specification No. 27531; 1944. Indicator; Temperature, Type B-2, Aircraft, Thermocouple Type.

U. S. Gov., Army Air Forces. Specification 27538-1; 1944. Indicator; Temperature, General Specification for.

U. S. Gov., Federal Specification GG-T-321; 1931. Thermometers; Industrial. Covers seven classes (A, B, C, D, E, F, and G) with separable metal sockets, for refrigerating brine lines, refrigerator-room, outboard delivery, main injectors, bearing thermometers, lubricating oil, oil-cooler oil and water, fuel oil heater, condensers, feedwater, low-pressure and high-pressure steam, high-pressure superheat, and flue gas. Gives detail requirements; method of sampling, inspection, and test; and requirements for packing and marking for shipments.

U. S. Gov., Marine Corps Specification, 1936. Thermometer; Mercurial, Common.

U. S. Gov., Navy Dept. Specification 18T1d; 1944. Thermometers; Water, Standard.

U. S. Gov., Navy Dept. Specification 18T4c; 1940. Thermometers; Mercurial, Common.

U. S. Gov., Navy Dept. Specification 18T5b; 1918. Thermometers; Air, Standard.

U. S. Gov., Navy Dept. Specification 18T7j; 1944. Thermometers; Industrial.

U. S. Gov., Navy Dept. Specification 18T9e; 1943. Thermometers; Storage Battery.

U. S. Gov., Navy Dept. Specification 18T13b; 1944. Thermometers; Distant Reading, Indicating Dial.

U. S. Gov., Navy Dept. Specification 18T14f; 1943. Thermometers; Mercurial, Navy Type.

U. S. Gov., Navy Dept. Specification 18T23b; 1945. Thermometers; Indicating Dial, for Superheated Steam.

U. S. Gov., Navy Dept. Specification 18T24a; 1942. Thermometers; Mercurial, for Superheated Steam.

U. S. Gov., Treasury Dept., Procurement Div., No. 520; 1941. Thermometers; Candy. Covers one grade and two types—(I) glass bulb and stem and (II) thermostatic metal. Gives requirements for material and metal parts; bulb, stem, column, scale, tolerance, and frame for type I; design, scale, hand, case and tolerance for type II; sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-27224-B; 1937. Thermometers; Aircraft (Round Dial, Free Air), General Specification for.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2172A; 1941. Thermometer; Ward.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2550; 1939. Thermometer; Incubator.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2690; 1939. Thermometer; Dairy.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 55-2; 1923. Thermometer.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-5363a; 1940. Thermometer; Cable Tank.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-2-C; 1931. Thermometer; Type ML-4, Maximum, F., Mercury.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-3-C; 1931. Thermometer; Type ML-5, Minimum, F., Alcohol.

U. S. Gov., U. S. Army, Signal Corps. Specification 74-20B; 1931. Thermometer; Type ML-7, Mercurial F.

References.—Thermometer connections, methods of testing and certification of thermometers, *see* 919.80; analysis of glass, *see* 918.0.

919.9 SCIENTIFIC AND LABORATORY APPARATUS NOT ELSEWHERE CLASSIFIED

Acoustical Society of America, sponsor. American Standards Assn., Z24.3-1944. Sound Level Meters for Measurement of Noise and Other Sounds. For obtaining results which will approximate the loudness level obtained by the more elaborate ear-balance method. Covers purpose and definitions; and appendices cover response-frequency characteristics of sound level meters, tests for root mean square addition, calibration adjustment of individual sound level meter, tolerances in response-frequency characteristic, and correction of reading on specific noises.

American Society of Mechanical Engineers. Power Test Codes, Auxiliary Section. Part 17—Determination of the Viscosity of Liquids, 1931. Outlines procedure to follow and precautions to be observed in taking readings. Describes types of viscometers.

American Society for Testing Materials, D 88-44; 1944. American Petroleum Institute Standard, 518-44. American Assn. of State Highway Officials, T 72-44. American Standards Assn., Z11.2-1944. Method of Test for Viscosity by Means of the Saybolt Viscosimeter. Covers use of Saybolt Universal viscosimeter for general use and of Saybolt Furol viscosimeter for fuel and road oils, dimensions and design of apparatus, temperatures of tests, and outline of procedure.

U. S. Gov., Army Air Forces. Specification No. 40819; 1944. Tester; Liquidometer Instrument, Standard and Field.

U. S. Gov., Army Air Forces. Specification No. 40833; 1944. Stand; Thermometer Test.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Gage; Wind.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Hygrometer; Duff.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Meter; Forest Fire Danger.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Recording Forms.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Sticks; Fuel-Moisture-Indicator, R1 Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification for Sticks; Fuel-Moisture-Indicator, R6 Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-130, Fire Finder; Osborne.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 131. Fire Finder; Wood Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-135. Fire Finder Stand; Metal.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 136. Fire Finder Stand; Wood.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-451. Gage; Rain and Measurement Sticks.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 456. Meter; Visibility, Byram.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-457. Psychrometer; Fan.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-458. Psychrometer; Sling, Pocket Size.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-459-S. Psychrometer; Wicking.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-461. Scale; Fuel-Moisture-Indicator.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 466. Screen; Fuel-Moisture-Indicator Stick.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 467. Shelter; Weather-Instrument, R1-Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 468. Shelter; Weather-Instrument, R6-Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-473. Support; Townsend, U. S. Weather Bureau Standard.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 477. Vane; Wind.

U. S. Gov., Marine Corps Specification, 1941. Color Comparator. Water Purification Equipment.

U. S. Gov., Marine Corps Specification, 1930. Micrometer Sight Adjuster, for U. S. Rifle, Caliber .30, Model 1903, Springfield.

U. S. Gov., Navy Dept. Specification 18T22; 1940. Tachometers; Portable and Fixed.

U. S. Gov., Navy Dept. Specification 5714; 1943. Indicators; Carbon-Dioxide, Absorption-Type, Portable.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 87-3; 1941. Color Comparator for Water-Purification Units.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-102A; 1943. Powder; Flashlight, Photographic.

920-929 MUSICAL INSTRUMENTS

921. PIANOS

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 2. Pianos; Grand.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 3. Pianos; Upright and Spinet Type.

922. PIANO ACTIONS, PARTS, AND MUSIC ROLLS

923. ORGANS

U. S. Gov., Joint Army-Navy Specification JAN-O-86; 1944. Organs; Folding, Chaplain's.

924. PHONOGRAPHS

925. BAND INSTRUMENTS

925.1 BUGLES

U. S. Gov., Navy Dept. Specification 36I2a; 1944. Instruments, Musical; Bugles; and Stands, Music.

925.2 FIFES

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-2; 1923. Fife; Metal, Bb, Actual.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-15; 1938. Musical Instruments; Flute and Picollo.

925.3 TRUMPETS

U. S. Gov., Marine Corps Specification, 1941. Trumpet.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-3A; 1938. Musical Instrument; Valve and Slide.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-4A; 1938. Musical Instrument; Saxophones.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-7A; 1938. Musical Instrument; Clarinet.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-19; 1940. Musical Instrument; Trumpet, G With Slide to F.

925.4 DRUMS AND TIMPANI

U. S. Gov., Navy Dept. Specification 36I2a; 1944. Instruments, Musical; Bugles; and Stands, Music.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-11; 1928. Musical Instrument; Tympanis, Pair.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-17; 1938. Musical Instruments; Drums, Bass and Snare.

925.9 MISCELLANEOUS

U. S. Gov., Navy Dept. Specification 36I2a; 1944. Instruments, Musical; Bugles; and Stands, Music.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-18; 1938. Musical Instruments; Xylophone and Bells.

929. STRINGED MUSICAL INSTRUMENTS, EXCEPT PIANOS

U. S. Gov., Navy Dept. Specification 36I2a; 1944. Instruments, Musical; Bugles; and Stands, Music.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 31-16; 1938. Musical Instruments; Violin, Viola, Violoncello, Bass Viol.

930-939 OFFICE, PRINTING, LITHOGRAPHIC, AND EDUCATIONAL SUPPLIES

931. HANDWRITING SUPPLIES

931.1 PENCILS, LEADS, AND CRAYONS

American Hospital Assn., 49-31. Lead Pencils. Covers one grade in four types. Based on U. S. Gov. Federal Specification SS-P-166.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Lead Pencils. Covers description, derivation, types and grades, and containers and ordering.

U. S. Gov., Federal Specification GG-P-171; 1943. Pencils; Skin-Marking. Covers one grade; two types—(I) single color and (II) two-color combination; and two classes—(A) wood casing and (B) paper casing. Gives requirements for colors, marking mediums, casings, workmanship, instruction sheet, marking, finish, point protector, bid sample, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-C-646; 1943. Crayons; Lumber. Shall be one type suitable for use in writing on green, wet, and dry lumber. Gives requirements for material, workmanship, composition, shape, tolerance, color fastness, bleeding, wrapper, and marking; table showing size, breaking strength, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-P-166; 1935. Amendment 1; 1944. Pencils; Lead. Covers one grade and four types—(I) carpenters'; (II) checking, black; (III) copying; and (IV) general writing. Gives requirements for degree of hardness of lead, leads, casings, workmanship, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification SS-P-186; 1941. Amendment 1; 1944. Pencils, Mechanical; Leads; and Erasers. Covers a type of pencil suitable for 4-in. lead in two classes—(A) polygonal and (B) round.

Gives requirements for 10 hardnesses of black lead and for 10 colored leads, definitions, operating mechanism, barrels, points, clips, eraser, length, finish, lettering, and leads; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-P-196; 1944. Pencils; Spiral-Paper Form, Wax. Covers one type, one grade, and three classes—(A) blue marking, (B) red marking, and (C) other color marking. Gives requirements for material, workmanship, marking medium, lettering, description, size, color, and covering; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-P-201; 1939. Pencils; Wood-Cased, Colored-Lead, (General-Use). Covers two types—(I) pigment-type lead (in two classes—thin-lead and thick-lead) and (II) water-soluble dye-type lead (thin-lead). Gives requirements for leads, casings, workmanship, shapes, and sizes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 53C10b; 1942. Crayons; Metal Workers', Soapstone.

U. S. Gov., Navy Dept. Specification 53P24; 1942. Pencils; Lead, Drawing.

U. S. Gov., U. S. Army, Medical Dept. Specification 1-40; 1939. Pencil; Wax.

U. S. Gov., Veterans Administration. Specification VA-G-110; 1934. Pencils, Automatic; and Pencil-Leads.

References.—Cedar lumber stock for pencils, *see* 413.9; blackboard chalk, *see* 937.1.

931.2 PENHOLDERS, PENCIL HOLDERS, CRAYON HOLDERS

U. S. Gov., Federal Specification GG-P-181a; 1941. Amendment 1; 1944. Penholders; Wood. Covers one grade and four types—(I) cork tip, metal insert; (IV) wood grip, imbedded metal end, with metal ferrule; (V) wood grip, imbedded metal end, without metal ferrule; and (VI) wood grip, protruding metal center. Gives general and detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

931.3 PENS

U. S. Gov., Navy Dept. Specification 53P5e; 1941. Pens; Lettering, Mapping, Ruling, and Writing.

U. S. Gov., Treasury Dept., Procurement Div., No. 313; 1939. Pens; Writing, Corrosion Resisting Steel. Covers four types—(I) ball-type point (spoon shape), (II) fine point (short nib), (III) medium point (falcon), and (IV) stub point (falcon). Shall be made of corrosion resisting steel, smooth and free from cutting and slitting burrs. Gives requirements for finish and corrosion resisting properties; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Fountain pen stock, pyroxylin, *see* 846.5.

931.4 ERADICATORS AND ERASERS

U S. Gov., Federal Specification GG-E-671; 1933. Amendment 1; 1943. Erasers; Steel. Covers two types—(I) knife blade and (II) arrowhead. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Amendment No. 1 deletes type I.

U. S. Gov., Federal Specification GG-S-321; 1938. Shields; Erasing. Covers one type and grade. Gives requirements for material, workmanship, bid sample, finish, thickness, elasticity, design and size, and material; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 722; 1945. Eradicators; Ink. Covers one grade and two types—(I) one-solution unit and (II) two-solution unit. Gives requirements for type I ink eradicating properties, type II ink eradicating properties, and feathering; methods of sampling, inspection, and tests; and packaging. packing, and marking for shipment.

References.—Solvent for laundry marking inks, *see* 933.0.

931.5 DESK PADS, BLOTTER HOLDERS, AND HAND BLOTTERS

U. S. Gov., Federal Specification GG-C-101a; 1939. Calendar Pads and Stands. Covers three types—(I) ordinary folding, (II) bound daily memorandum, and (III) executive large size, folding. Gives requirements for material, workmanship, stand, rubber shoes, pad; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-GG-C-101a; 1943, changed requirements for material, binding wires, sample, and specifies protective shoes in lieu of rubber shoes.

U. S. Gov., Federal Specification UU-P-16; 1939. Amendment 2; 1944. Pads; Desk. Covers one grade and three types—(I) cardboard, (II) felt, and (III) linoleum. Gives requirements for sizes, material, workmanship, corners and panels, artificial leather, sample of pads, and colors; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 53B7; 1929. Blotters; Hand, Wood.

U. S. Gov., Navy Dept. Specification 53P20; 1940. Pads; Inking, Numbering-Machine.

References.—Blotting paper, *see* 471.1.

931.6 PAPER AND INKS

U. S. Gov., Federal Specification UU-P-21a; 1943. Pads; Memorandum. Covers two types—(I) chemical wood and (II) ground wood. Gives requirements for sizes, material, workmanship, number of sheets, padding and back, ruling, comparison sample, writing quality, stock, weight, and bursting strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Writing paper, composition books, *see* 478.1, 481; writing inks, *see* 933.1.

932. OFFICE DEVICES AND SUPPLIES (EXCEPT HAND-WRITING SUPPLIES)

932.1 OFFICE MACHINES

U. S. Gov., Federal Specification GG-M-61; 1937. Amendment 2; 1943. Machines; Numbering, Automatic, Hand-Operated. Covers the self-inking, automatic type, having six wheels or less, to operate without any manual manipulation of the type wheels. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GG-M-71; 1930. Amendment 1; 1943. Machines; Numbering, Lever-Type. Covers self-inking, portable machines for desk use. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GG-M-81; 1944. Machines, Paper-Fastening; and Staples. Gives requirements for material and workmanship, clinching capacity, staples magazine, stapling reach, raceway, finish, interchangeability of parts, springs, staple drivers, anvils or dies, plungers, base of machine, hinge pin, and handles; staples; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-M-91; 1933. Machines; Stencil-Cutting, Hand-Operated. Covers the portable type for use on a table. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GG-P-191b; 1944. Perforators; Paper, Desk. Covers two types—(I) adjustable and (II) nonadjustable; two classes--(A) 2-hole and (B) 3-hole. Gives requirements for material, workmanship, receptacle for punchings, base, springs, finish, performance, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification GG-T-406; 1936. Time-Stamps. Covers two types—(I) magnetic imprint (trigger operated and push bar operated) and (II) manual imprint. Gives requirements for materials, workmanship, imprints, letters and figures, ribbon, design, stamp, mechanism, stamp frame, and type wheels; method of inspection and test; and requirements for packing and marking for shipment.

U. S. Gov., Federal Specification GGG-P-846; 1939. Amendment 1; 1943. Punches; Paper, One-Hole (With and Without Eyelet Device). Gives requirements for handle grips, thickness of handle steel, hardness of punch, hardness of channel, diameter of spring wire, finish, performance, gage, dimensions, width of jaw, and punch; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-42; 1940. Machine; Duplicating, Direct Fluid Process Type, Sheet Size 19 by 20 Inches, Printing Area 14 by 16 Inches, Hand Operated.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-44; 1940. Machine; Duplicating, Rotary Offset, Sheet Size 20 by 20 Inches, Printing Surface 17 by 19 Inches, Electrically Operated.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-49; 1940. Duplicator; Gelatine Process.

U. S. Gov., Veterans Administration. Specification VA-G-69; 1932. Check Feed, Ejector, and Stacking Attachment.

U. S. Gov., Veterans Administration. Specification VA-G-142; 1935. Perforating Machine.

932.2 SUPPLIES FOR OFFICE MACHINES

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-81; 1938. Purple Copy Ribbons AAR-1-A and AAR-2-A for Use in Automatic Printers. For inked cotton ribbon tape used in tape and page printers; requirements weave, length, width, and thickness of tape; wear test and impression test.

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-82; 1938. Black Record Ribbons AAR-3-A and AAR-4-A for Use in Automatic Printers. Gives dimensional and quality requirements for inked cotton tape used in tape and page printers, wear resistance test, and impression test.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Typewriter Ribbons. Covers general requirements, fabric, ink, and containers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C426; 1940. Inks. Outlines briefly the history of writing inks, in particular those of the iron gallotannate type; gives formulas for a few of these inks and for three iron gallate inks; discusses the aging of writing, the restoration of faded writing, freezing of inks, and effect of inks upon paper. Formulas are also given for other kinds of inks, including colored writing inks, drawing, stamp pad, recording-instrument, and others. Methods of testing given in Federal specifications for inks are described. Information is given on equipment for making ink in the home and on dyes suitable for making inks.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C431; 1941. Typewriter Ribbons and Carbon Paper. This circular gives general information about the manufacture of typewriter ribbons and carbon paper, and tells about the methods for testing them. The materials used and the principles involved in making the ink for ribbons and the coating for carbon paper are discussed. No formulas are given for either the ink or the coating because none that can be regarded as up-to-date are available.

U. S. Gov., Federal Specification GG-M-81; 1944. Machines, Paper-Fastening; and Staples. Gives requirements for material and workmanship, clinching capacity, staples magazine, stapling reach, raceway, finish, interchangeability of parts, springs, staple drivers, anvils or dies, plungers, base of machine, hinge pin, and handles; staples; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-P-185a; 1943. Paper; Computing-Machine. Covers two types—(I) chemical wood and (II) ground wood. Gives requirements for printing quality, writing quality, finish, widths, rolls, stock, weight, bursting strength, and brightness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-R-271; 1930. Amendment 2; 1941. Ribbons; Computing and Recording-Machine. Covers two types—(A) single color and (B) two-color and three-color. Gives requirements for fabric, inking, dimensions, thread count, thickness, breaking strength, edges, character of writing, type filling, press copies, permanence of writing, and special ribbons; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-R-291; 1930. Amendment 2; 1941. Ribbons; Hectograph. Covers two types—(A) single color, purple; and (B) two colors, purple and red. Gives requirements for fabric, inking, width, length, thread count, thickness, edges, character of writing, and copies; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification DDD-R-311a; 1936. Amendment 4; 1944. Ribbons; Typewriter. Covers one grade and three types—(A) single color, (B) two-color, and (C) combined record and copying. Gives requirements for fabric, thread count, width, length, thickness, edges, inking, character of writing, weardown, recovery, permanency of writing, spools and reversing attachments, and comparison sample; methods of sampling, inspection, and tests; and packaging, packing, and marking. Emergency Alternate Federal Specification E-DDD-R-311A; 1941, changed requirements for thread count and thickness.

U. S. Gov., Treasury Dept., Procurement Div., 436A; 1942. Pads; Typewriter, Felt. Shall be of one type, grade, and size; of a uniform dark color; and made of a good grade of wool and cotton mixture, or animal hair. Gives requirements for hair pads, cotton and wool pads, shape, dimensions, breaking strength, and color fastness; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U.S. Gov., Treasury Dept., Procurement Div., 448b; 1943. Cylinders; Dictating-Machine. Covers two types—(I) cloth-lined and (II) unlined. Gives requirements for material, workmanship, dimensions, internal pressure, cleanliness, and recorded sound and surface noise; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 554b; 1942. Shields; Erasing, Typist. Shall be an opaque or transparent plastic material, plain or colored, or vulcanized fiber. Cellulose nitrate plastics shall not be used. Gives requirements for finish, thickness, and design; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 661; 1944. Duplicating-Liquid; Direct-Process, Spirit Type. Covers one type and one grade. Gives requirements for appearance, surface tension, neutralization number, free alkali, nonvolatile matter, miscibility, spot tests, residual odor, copper corrosion, drying properties, and dye solubility; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 1-39; 1939. Pad; Mimeograph.

U. S. Gov., Veterans Administration. Specification VA-G-6; 1932. Addressograph Ribbons.

U. S. Gov., Veterans Administration. Specification VA-G-62a; 1934. Paper; Computing Machine.

References.—Methods of testing cotton fabrics, *see* 300.4; inks, *see* 933.

932.3 RECEPTACLES, SUPPORTS, AND HOLDERS

U. S. Gov., Federal Specification DD-C-791; 1930. Cups; Pin and Sponge. Covers one size and type. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GG-R-41; 1935, Amendment 1; 1943. Racks; Pen or Pencil. Covers one grade and two types—(I) glass and (II) metal, with spiral spring coil. Gives detail requirements; and methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U.S. Gov., Federal Specification RR-B-131; 1937. Amendment 1; 1944. Baskets; Desk, Steel (Strip and Wire). Covers one grade and four types—(I) woven wire, (II) welded wire, (III) woven strip steel, and (IV) baskets to build in sections. Gives requirements for material, workmanship, dimensions, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 42H40; 1944. Holders; Card.

U. S. Gov., Treasury Dept., Procurement Div., No.595; 1942. Holders; Copy, Typists, Side Reading. Covers one type and grade suitable for placing on a desk or table. Gives requirements for reading plate, gripping mechanism, base, guide line bar, wood, composition board, and finish; methods of sampling, inspection, and tests; and packing and marking.

References.—Stationery holder, box type, *see* 435.5; card filing trays, *see* 435.5, 613.7.

932.4 DESK CUTLERY

U.S. Gov., Federal Specification GG-S-236; 1935. Amendment 1; 1944. Sharpeners; Pencil. Covers two types—(I) draftsmen's and (II) general writing, plain. Gives requirements for material, workmanship, cutters, aperture, receptacle, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U.S. Gov., Federal Specification UU-S-171; 1939. Seals; Notarial. Covers two types—(I) laminated with gold-colored foil and (II) coated. Gives requirements for sizes, depth of serrations, weights, and thickness; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.550; 1942. Openers; Envelope, Plastic. Covers one type and grade and shall be slow or nonburning synthetic resinous material. Cellulose nitrate compounds shall not be used. Gives requirements for length, blade, handle, flexibility, impact, warpage, and color; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Steel erasers, *see* 931.4.

932.5 ADHESIVES, CLIPS, AND FASTENERS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Paste; Office Adhesive. Covers definition, derivation and characteristics, grades, containers, and substitutes.

Pin, Clip, and Fastener Assn. Paper Fastener Physical Standards. Covers gages and diameters and widths of caps; gauges, widths and lengths of shank for available sizes of steel paper fasteners.

Pin, Clip, and Fastener Assn. Physical Dimensions Brass and Steel Washers. Covers gauge, diameter, and slot dimensions of steel washers for use in connection with paper fasteners.

U.S. Gov., Federal Specification N-P-101c; 1944. Paste, Office and Photomounting; Paste Brushes; and Spreaders.

Covers two types—(I) hard white paste (for office and photomounting use) and (II) semiliquid paste (for office use only). Gives requirements for composition, discoloration of paper, adhesive strength, jars and tubes, brushes and spreaders, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification FF-C-431; 1942. Clips; Paper, Binder. Covers one type and grade in three sizes—large, medium, and small. Gives requirements for clip spring portion, finish, marking, clip handle, and material and workmanship; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification FF-C-436; 1935. Amendment 1; 1944. Clips; Paper, Wire. Covers two types—(I) gem-pattern (large and small) and (II) ideal-pattern (large and medium). Gives requirements for material, workmanship, finish, tolerance, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification FF-F-101; 1932. Fasteners; Paper, Brass. Covers two types—(I) flat head and (II) round head. Gives requirements for material and workmanship; length, other dimensions, and chemical composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-FF-F-101; 1943, required the use of steel or fiber and gave detailed requirements for these materials.

U. S. Gov., Federal Specification FF-F-111; 1942. Fasteners; Paper, Flexible, Metallic (Not for Use With Binder Covers Having Removable Slide Attachments). Covers one type with prongs. Gives requirements for spacings, capacities, material, workmanship, compressor, base, marking, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification FF-F-118; 1944. Fasteners; Paper, Steel (Flat and Round Head). Covers two types—(I) flat head and (II) round head. Gives requirements for material, workmanship, design, lengths, other dimensions and tolerances, bending endurance, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification JJJ-M-791a; 1943. Mucilage. Covers one type. Gives requirements for material and workmanship, adhesiveness, quickness of set, preservatives, brush, and viscosity; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification JJJ-W-151a; 1938. Wax; Sealing. Covers two types—(I) stick type to be heated over a flame and (II) in bulk for use in gas or electrically heated melting pots; and four grades—A, B, C, and D. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, 1941. Paste; Target, Dry.

U. S. Gov., Navy Dept. Specification 53C3a; 1941. Clips; Paper, Bulldog Type.

U.S. Gov., Navy Dept. Specification 53C7; 1942. Clips; Plan-File.

U. S. Gov., Treasury Dept., Procurement Div., 341c; 1943. Machines, Paper-Fastening, and "Standard" Staples. Covers paper-fastening machine suitable for use with "standard" staples, and requirements for staples. Gives requirements for material, clinching capacity, staple magazine, stapling reach, raceway, finish, interchangeability of parts, springs, staple drivers, anvils or dies, plungers, base of machine, handles, requirements for staples; methods of sampling, inspection, and tests.

U. S. Gov., Veterans Administration. Specification VA-G-59; 1932. Pins.

U. S. Gov., Veterans Administration. Specification VA-G-60; 1932. Clips; Paper, Wire.

U. S. Gov., Veterans Administration. Specification VA-X-32c; 1941. Cement; Bookbinding, Waterproof.

U. S. Gov., Veterans Administration. Specification VA-X-74c; 1941. Cement; Leather (Paste).

References.—Methods of testing and general requirements for metals, *see* 644.11, 600.1; rubber bands, *see* 208.2; methods of testing glue, *see* 093.0.

932.6 BINDERS AND STUB FILES

U. S. Gov., Federal Specification UU-B-338; 1944. Binders; Loose-Leaf, Flexible-Tape Type. Covers one grade. Gives requirements for material, workmanship, construction, covers, covering material, binding sticks, hinge, tapes, and gripping device; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification UU-B-346; 1942. Amendment 1; 1944. Binders; Loose-Leaf, Ring Type. Covers 2-ring, 3-ring, 4-ring, and 6-ring binders, in canvas, leather-bound, and imitation leather. Gives requirements for binders, board, mechanism and metals, ring spacing, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1919. Binders; Loose-Leaf.

U. S. Gov., Navy Dept. Specification 53B6a; 1932. Binders; Loose-Leaf, Catalogue.

U. S. Gov., Treasury Dept., Procurement Div., 374B; 1942. Binders; Current-Ledger. Shall be one type and grade. Gives requirements for binders board, lining, canvas binding, leather binding, mechanism, capacity, lining paper, binding material, and sticks; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 675; 1944. Binders; Sectional-Post Type. Gives requirements for material, workmanship, construction, covers, binding material, lining, hinge, post assembly, finish, and index tab allowance; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 678; 1944. Binders; Permanent, Light Duty. Covers only stock size binders having two locking units in seven classes. Gives requirements for material, workmanship, construction, sizes, covers and backs, binding material, lining, hinge, binding sticks, permanent locking units, metal finish, index tab allowance, and details for each class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.681; 1944. Binders; Permanent, Heavy Duty. Shall be heavy duty permanent type in two classes—(A) cover with cabinet lock and (B) cover without cabinet lock. Gives requirements for sheet sizes, capacity, material, workmanship, construction, covers, backs, binding material, lining, hinge, end sheets, sheet holding bars, pintle bar housing, posts, post locking device, permanent locking units, metal finish, and index tab allowance; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.682; 1944. Binders; Screw Post, Flexible Cover. Gives requirements for material, workmanship, construction, sizes, screw posts, covers, tongue, finish, and index tab allowances; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.702; 1944. Binders; Record Type, Self-Aligning. Covers binders of the record type in sheet sizes and capacity as listed in table I. Gives requirements for construction, covers, backs, hubs, binding material, lining, hinges, end sheets, stubs, pintle bar housing, pintle bars, sheet holding bars and permanent locking units, metal finish, and index tab allowance; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.708; 1944. Files; Board, for Paper. Covers two types—(I) arch board with paper perforator (size B, 9 in. x 14 1/2 in. and C, 9 in. x 17 in.); and (II) clip board (size A, 9 in. x 12 1/2 in. and C, 9 in. x 17 in.). Gives requirements for material and workmanship, backs, finish, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.719; 1945. Binders; Prong. Covers two types—(I) 3-position catch and (II) 2-position catch; two classes—(A) fabric hinges and (B) steel hinges; nine sheet sizes; and capacities 1, 1 1/2, 2, 3, and 4-in. Gives requirements for material, workmanship, construction, covers, back, catches, hinges, prongs, binding material, lining, index tab allowance, and metal finish; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No.720; 1945. Binders; Angle Back, Lift Ring and End-Lock. Covers two types—(I) lift ring lock and (II) telescoping end-locks; and six classes. Gives requirements for sizes, capacities, material, workmanship, construction, covers, angle backs, aligner, binding material, lining material, hinges, locking device, post assembly, label holders, index tab allowance, metal finish, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 1-38; 1939. Binder; Medical History.

932.9 MISCELLANEOUS OFFICE DEVICES AND SUPPLIES

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-54; 1930. Message Rack AAR-1-A. Covers two alternate methods of constructing welded steel message rack, quality of materials, design requirements, finish, and dimensional drawings.

Assn. of American Railroads, Telegraph and Telephone Section, 2-K-24; 1937. Revolving Message Rack AAR-1-A. Gives requirements for 36 compartment message rack for use in telegraph offices, metal parts, welding, finish, and dimensional drawing.

U.S. Gov., Federal Specification DD-I-546; 1935. Amendment 1; 1936. Inkstands, Automatic and Plain; and Desk-Sets. Covers one grade of individual inkstands in two types—(I) automatic, self-closing; in two classes—(A) round, 3-in. and (B) square, 3-in.; (II) Plain, square, 3-in. One grade of desk-sets in two types—(I) double desk and (II) single desk; in two classes—(A) round, 3-in. and (B) square, 3-in. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GG-R-791a; 1941. Amendment 1; 1943. Rules; Desk. Covers four types—(I) with double brass edgings and brass ends, (II) with single brass edgings and brass ends, (III) with brass edging only, and (IV) without brass edging or brass ends. Lengths of 12, 15, 18, and 24 in. for types I, II, and III, and 12 in. for type IV. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification RR-S-714; 1943. Amendment 1; 1944. Stencil-Outfits (Letters and Figures); Metallic. Shall be of the lockedge type, and shall be 1/2, 1, 2, 4, and 6-in. sizes. Covers material, workmanship, and details of stencil-outfit, stencils, ink, brush, stencil box, and marking; methods of sampling, inspection, tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification SS-P-551; 1942. Pointers; Pencil (Abrasive-Paper). Covers one type, one grade, and two classes—(A) emery paper, (B) flint paper. Gives requirements for material, workmanship, pads, holders, and assembly; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-C-621; 1942. Correction-Compound; Stencil. Covers one type and grade. Gives requirements for viscosity, drying properties, thinning properties, film properties, and performance; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-P-16; 1933. Pads; Stamp. Covers one grade; three types—(I) dry; (II) inked, regular; and (III) inked, quick-drying; and two classes—(A) nainsook and (B) cotton plush. Gives requirements for sizes, colors, cover material, construction, inking, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification UU-C-93; 1942. Cards; Guide, Pressboard (Card-Size). Covers four types. Gives requirements for stock, weights, thicknesses, bursting strength, texture, finish, tabs, sizes, color, and grain; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-R-196; 1939. Reinforcements; Gummed (Cloth). Covers ten types and one grade. Gives requirements for design, sizes for cloth, gumming, tolerances, and holes; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification ZZ-P-41; 1937. Pads; Finger, Rubber, (for) Office Use. Covers a single grade and two types—(I) perforated and (II) without perforations. Gives requirements for design, dimensions, accelerated aging test, tensile strength, and ultimate elongation; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-ZZ-P-41; 1942, required pads to be made entirely of reclaimed rubber and changed physical tests.

U. S. Gov., Federal Specification DDD-P-51; 1942. Pads; Chair, Felt. Covers one type and two grades—(A) all wool and (B) wool and cotton mixture. Gives requirements for color (tan or green), material, workmanship, dimensions, felt and colors, shape, straps, and details; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-DDD-P-51, Jan. 1943, required one type and grade, and changed requirements for color, material, and details.

U. S. Gov., Joint Army-Navy Specification JAN-R-161; 1944. Rules; Rolling, Brass, 18-In.

U. S. Gov., Navy Dept., Specification 53 0 2; 1940. Openers; Envelope.

U. S. Gov., Navy Dept. Specification 53S2a; 1938. Stamps; Rubber.

U. S. Gov., Treasury Dept., Procurement Div., 298B; 1942. Stamps, Rubber. Covers four types of stamps, to be made of sheet rubber. Gives requirements for handles, metal portions, and details of each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.312; 1939. Holders; Notebook, Stenographers'. Shall be suitable for use with stenographers' notebooks both as a support for notebook when taking dictation and as a stand when transcribing. Gives requirements for sizes, general design, inner board, cover material, lining material, strap material, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 632; 1943. Cases; Index Card and Storage or Transfer (Wood or Fiber). Covers type I, index card cases—class A, with hinged covers and class B, with hinged cover and hinged drop front; and type II, storage or transfer cases—class A, with detachable cover and follower. Gives requirements for material, tolerance, construction, sizes, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 677; 1944. Boards; Record-Control, Visible. For the purpose of giving a visual presentation of facts regarding progress, production, scheduling, records, inventory, etc., in quantities and percentages as pertain to time and dates. Covers two types—(I) single-panel board and (II) double-panel board; and two styles—(1) 100 horizontal peg-holes and (2) 200 horizontal peg-holes. Gives requirements for material and workmanship, performance, finish, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 1-41; 1939. Rack; Stamp.

U. S. Gov., U. S. Army, Medical Dept. Specification 1-42; 1939. Stamp; Dating.

References.—Fiber waste paper baskets, *see* 952.14.

933. INKS

933.0 GENERAL ITEMS

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Ink. Covers definition, properties, kinds, types, substitutes, containers, uses, and ordering.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C426; 1940. Inks. Outlines briefly the history of writing inks, in particular those of the iron gallotannate type; gives formulas for a few of these inks and for three iron gallate inks; discusses the aging of writing, the restoration of faded writing, freezing of inks, and effect of inks upon paper. Formulas are also given for other kinds of inks, including colored writing inks, drawing, stamp pad, recording-instrument, and others. Methods of testing given in Federal specifications for inks are described. Information is given on equipment for making ink in the home and on dyes suitable for making inks.

933.1 WRITING INKS

American Hospital Assn., 49-28. Writing Ink. Covers blue-black in four classes. Based on U. S. Gov. Federal Specification TT-I-563a.

U. S. Gov., Federal Specification TT-I-521; 1930. Amendment 1; 1940. Ink; Copying and Record. Covers the blue-black type, iron gallo-tannate ink. Gives detail requirements for composition; methods of sampling and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-TT-I-521; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for chemical composition of ink.

U. S. Gov., Federal Specification TT-I-563a; 1940. Amendment 3; 1942. Ink; Writing. Covers the blue-black type in four classes—(1) fluid, (2) concentrated, (3) powder, and (4) tablets. Suitable for permanent records. Gives requirements for materials, composition, and physical properties; methods of sampling and tests; and requirements for packaging, packing, and marking for shipment.

References.—Methods of testing, *see* 933.0.

933.2 PRINTING AND LITHOGRAPHIC INKS

U. S. Gov., Treasury Dept., Procurement Div., No. 364; 1939. Inks; Offset-Duplicating. Covers two types—(I) for direct image duplicating (typewriting, crayon, ruling, etc.) on offset paper mats or mechanically grained duplicating plates; and (II) for photographic duplicating on mechanically grained zinc duplicating plates. Gives detail requirements and methods of sampling, inspection, and tests.

U. S. Gov., Treasury Dept., Procurement Div., No. 603; 1943. Plate Ink (Developing Ink), (for) Offset Duplication. Covers one type and one grade intended for use as a developing ink in the albumen process of offset duplication. Gives requirements for color (black), solubility, and practical performance test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-26; 1937. Ink; Hand Press, Lithographic, Black.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-38; 1922. Ink; Printing, Bright Vermillion.

933.3 DRAFTING AND DRAWING INKS

U. S. Gov., Federal Specification TT-I-528a; 1942. Ink; Drawing, Waterproof, Black. Composed of carbon in a permanent state of suspension in a liquid medium, and no aniline dye. Gives requirements for composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification TT-I-531; 1934. Amendment 1; 1935. Ink; Drawing, Waterproof, Colored. Composed of a clear solution of a synthetic dye, or of a permanent suspension of a pigment in a liquid medium. Gives detail requirements for composition; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 601; 1943. Drawing Ink (Tusche), for Off-set Duplication. Covers one type and one grade intended for use in placing copy directly on metal or other offset duplicating plates. Gives requirements for practical performance test; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Methods of testing inks, *see* 933.0.

933.4 INKS FOR OFFICE DEVICES

U. S. Gov., Federal Specification TT-I-556; 1930. Amendment 1; 1940. Ink; Stamp-Pad. Covers two types—(I) regular and (II) quick-drying; and in black, blue, green, red, and violet. Gives detail requirements for composition; methods of sampling and tests; and requirements for packaging, packing, and marking.

References.— Methods of testing inks, *see* 933.0.

933.9 SPECIAL AND MISCELLANEOUS INKS

American Hospital Assn., 49-25. Red Ink. Covers one type. Based on U. S. Gov. Federal Specification TT-I-549.

U. S. Gov., Army Air Forces. Specification No. 31316; 1943. Ink; Stamp Pad, for Photographic Prints.

U. S. Gov., Army Air Forces. Specification No. 31317; 1943. Ink; Numbering Machine, for Photographic Negatives.

U. S. Gov., Federal Specification TT-I-542; 1930. Ink; Marking, Indelible (for) Fabrics. Covers two types—(a) for laundry and household use and (b) for marking blankets and unsized or unstarched materials. Gives detail requirements; method of sampling and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification TT-I-549; 1930. Amendment 1; 1940. Ink; Red. Covers one type. Gives detail requirements for composition; method of sampling and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, 1932. Ink; Stencil and Marking.

U. S. Gov., Marine Corps Specification, 1944. Ink; Stencil, Paste.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-277; 1943. Ink; Quick-drying, Photographic, for Aerial Film, Negative Marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 4-1097; 1939. Ink; Marking, Meat Inspection.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 36-2B; 1942. Ink; Marking, Black and White.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 36-3; 1933. Ink; Black, for Wooden Boxes.

References. — Methods of testing inks, solvent for marking inks, *see* 933.0; methods of testing textile materials, *see* 300.4.

935. DRAFTSMEN'S AND ENGRAVERS' DEVICES AND SUPPLIES

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Office and Drafting Room Practices (General). Gives standard office practices and graphic details and symbols concerning drafting-room practice.

American Society of Mechanical Engineers, joint sponsor with Society for the Promotion of Engineering Education. American Standards Assn., Z 14.1-1935. Drawings and Drafting Room Practice. This standard embodies what is generally agreed to be the best practice. Recommendations include arrangement of line work, dimensioning, sheet sizes, symbols for outside view, and lettering for engineering drawing.

American Society of Mechanical Engineers, joint sponsor with the American Institute of Electrical Engineers. American Standards Assn., Z 32.2-1941. Graphical Symbols for Use on Drawings in Mechanical Engineering. In addition to the symbols for plumbing, piping, pipe fittings and valves, heating and ventilating, heat power apparatus, conventional rivets, there are 150 symbols in the field of air conditioning, sprinklers, pneumatic tubes, ductwork, and refrigeration. An appendix contains symbols for gas, arc and resistance welding, and for location of welding information. There are more than 300 symbols in the collection.

Society of Automotive Engineers. Aircraft Engine Drafting Room Practice, 1944. Includes procedures for preparation of drawings, dimensioning by the decimal system, standardized notes, gears, thread specifications, materials, miscellaneous, and definitions.

U. S. Gov., Army Air Forces. Specification No. 24700; 1941. Board; Bombing Range Plotting.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-6-2; 1942. Machines; Drafting.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-11; 1943. Machines; Vector Plotting.

U. S. Gov., Army-Navy Aeronautical Specification AN-S-25; 1943. Sets; Navigation Drawing.

U. S. Gov., Federal Specification GG-I-531a; 1943. Instruments; Drawing, Nickel-Silver (First Grade). Covers ruling pens, compasses, compass parts, dividers, bow instruments, lead holder, and cases. Gives requirements for material and workmanship, construction of pieces, finish, points, pen blades, threads, adjusting nuts, handles, branding, and detail requirements for each piece; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification GG-S-776; 1932. Straightedges; Steel. Covers two types—(I) square-edged and (II) one edge beveled; either corrosion-resisting steel, or nickel-plated, best quality, unannealed tool steel. Gives detail requirements; methods of inspection and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-GG-S-776; 1942. (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted two types—(I) wood and (II) plastic; and two classes—(A) solid and (B) transparent edges; and gives requirements for same.

U. S. Gov., Federal Specification GG-T-671a; 1944. Triangles; Plastic, Transparent. Covers one grade. Gives requirements for angles and sizes, material, workmanship, design, finish, identification, flexibility, warpage, water absorption, tensile strength, elongation, light transmission, and haze; methods of sampling and tests; and packaging, packing. and marking for shipment.

U. S. Gov., Federal Specification GG-T-711b; 1944. T-Squares; Plastic, Wood, and Wood-and-Plastic. Covers two types—(I) fixed head and (II) double head (fixed and adjustable): three classes—(A) opaque blade (wood and plastic), (B) opaque blade (wood and plastic), with transparent edges, and (C) transparent blade; and sizes 18, 24, 30, 36, 42, 48, or 60 in. Gives requirements for materials and workmanship, table of dimensions, tolerance, identification, finish, details for transparent plastic, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Joint Army-Navy Specification JAN-P-90; 1944. Protractors; Three-Arm, Transparent, Mark 2.

U. S. Gov., Joint Army-Navy Specification JAN-R-83; 1944. Rules; Parallel.

U. S. Gov., Marine Corps Specification, 1923. Board; Sketching.

U. S. Gov., Navy Dept. Specification 18M5; 1928. Machines; Drafting, Navigational.

U. S. Gov., Navy Dept. Specification 18P1c; 1944. Protractors; Three-Arm, Metal.

U. S. Gov., Navy Dept. Specification 18P5b; 1943. Protractors; Parallel-Motion.

U. S. Gov., Navy Dept. Specification 53L1; 1940. Lifters; Thumbtack.

U. S. Gov., Treasury Dept., Procurement Div., 236A; 1942. Machines; Blueprinting, Horizontal Type. Shall be built of metal with a cast iron or steel frame construction. Gives detail requirements as to type, design, illumination, contact, conveyor, feed, speed, control, ventilation, protection, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 512a; 1942. Liners; Section. Covers one type and one grade and shall be constructed to permit the drawing of parallel lines. Gives requirements for design and construction, base, mountings, and ruler arm; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., procurement Div., 527a; 1942. Scales; Drawing, Boxwood (Architects, Engineer's, and Metric). Covers several types, classes, and sizes of flat and triangular scales. Shall be but one grade of scales from best grade of boxwood. Gives requirements for construction, graduated edge lining, markings, tolerance, cross section, and details for architects, engineer's, and metric scales; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 627; 1943. Lettering Devices. Covers two types—(I) lettering guide, scriber, and lettering pen, and (II) lettering guide, and lettering pen. Gives requirements for general design, bid sample, instructions, templates or lettering guides, construction, characters, pens, pencil adapter, pen-holder socket-adapter, scriber, cases, handle, and lettering pad; methods of sampling, inspection, and test; and packing and marking for shipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-1B; 1943. Board, Drawing; and Trestles (Horses) for drawing Boards.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-2A; 1929. Instrument; Drawing, First Grade, In Sets.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-3A; 1940. Compass; Beam, Micrometer Adjustment, In Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-4; 1921. Divider; Proportional, 10-Inch.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-5A; 1940. Scale; Plotting, Boxwood, Triangular.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-6; 1922. Box; Water Color, Colors, Water.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-10B; 1939. Board; Drawing, 16 by 22 Inches, Drafting and Duplicating.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-14; 1926. Scale; Map, Steel, Metric, 60-Cm.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-25; 1927. Spline and Weight, Set, in Box.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-26A; 1929. Protractor; N. S. Semicircular, With Arm, In Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-27; 1928. Protractor; N.S. Semicircular, 6-Inch, Without Arm.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-38; 1929. Scale; Boxwood, Architects' and Engineers', Triangular.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-39; 1929. Protractor; Bronze, Circular, 6 1/2-inch, With 3 Arms.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-40A; 1938. Straightedge; Steel, Graduated in Yards, 1:20,000.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-41; 1937. Protractor; Xylonite, Semicircular, 12 and 16 Inches, Graduated in Mils and Yards 1:20,000.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-42; 1937. Protractor; Xylonite, Fan, Range Deflection, Graduated in Mils and Yards, 1:20,000.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-43; 1939. Protractor; Xylonite, Semicircular, Machine Gun, 10-Inch, Graduated in Mils, M-1939.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 26-44; 1939. Board; Drawing, for Machine-Gun Units, with Carrying Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-9; 1921. Book; Note, Field.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-21; 1921. Measure Map.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-25; 1921. Curve; for Mechanical Engineers; Xylonite, Set of 10.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-33; 1921. Protractor; Rectangular, Xylonite 1/8 by 1 3/4 by 6 Inches.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-34; 1921. Protractor; Pencil Point.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-39; 1921. Scale; Map, Metric, Boxwood, 30 Centimeters, 1:50,000 and 1:10,000.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-40; 1921. Scale; Map, Metric, Boxwood, 30 Centimeters, 1:20,000 and 1:50,000.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-41; 1921. Scale; Map, Boxwood, 10-Inches, Meters and Yards, 1:62,500.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-42; 1921. Scale; Map, Boxwood, 10-Inches, Meters and Yards, 1:20,000.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-43; 1921. Scale; Map, Boxwood, 20-Inches, Meters and Yards, 1:10,000.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-41; 1921. Needle; Etching, Nos. 1, 2, 3, 5, and 6.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.3-3; 1921. Rule; Parallel, Rolling, 12 and 15 Inches.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.3-4; 1921. Pantograph; Hollow Brass Bars, 28 Inches, With Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.3-7; 1921. Ruler; Adjustable Curve, 15 and 30 Inches Long.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-11A; 1942. Board, Sketching, With Waterproof Cover; and Tripod, Sketching.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-22; 1929. Protractor; Xylonite, Circular and Semicircular.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-29; 1938. Scale; Plotting, Flat, Boxwood, 6-Inch, Graduated in Feet and Yards, 1:20,000.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-40; 1939. Book; Note, Level and Transit.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-50; 1943. Needles; Etching, Nos. 1, 2, 3, 5, and 6.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-53; 1943. Planimeter; Polar, Amseler's Pattern, 10-Inch Tracer Arm, Nickel Silver, W/Case.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-56; 1943. Triangle; Steel, Plated, Open Center.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 43-25; 1921. Curve; Railroad, Set of 30.

U. S. Gov., U. S. Maritime Commission. Specification 18-MC-11; 1945. Rulers; Parallel. Covers one grade; two types—(I) ungraduated and (II) graduated; and two classes—(A) with graduations on blades and (B) with integral semicircular protractor. Gives requirements for sizes, materials, workmanship, construction, blades, bars, grips, parallelism, marking, finish, and details for each type and class; sampling, inspection, and methods of test; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-G-21a; 1936. Boards; Drawing.

U. S. Gov., Veterans Administration. Specification VA-G-24; 1933. Compass and Divider.

References.—Nickel-silver bars, rods, shapes, *see* 655.1; thumb tacks, steel erasers, *see* 608.14, 931.4.

936. PRINTING AND LITHOGRAPHING DEVICES AND SUPPLIES

U. S. Gov., Treasury Dept., Procurement Div., 209D; 1942. Type-Cleaner; Liquid (With Dauber). Shall be of one grade. Gives requirements for distillation, burning properties, water, neutrality, residual odor, drying properties, corrosion test, bottles, and daubers; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 316B; 1942. Wash; Blanket and Roller, for Offset Duplicating Machines. Shall be furnished in one type and one grade, suitable for the cleaning of rubber blankets, rollers, etc. Gives requirements for water, corrosion, distillation, residual odor, drying properties, and flash point; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 331B; 1943. Plate-Etch; Aluminum and Zinc, (for) Offset Duplication. Covers one type and one grade and shall be suitable for use in the offset duplicating process. Gives requirements for alternate plate-etch and chemical composition of plate-etch; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 332b; 1943. Coating-Solution (Sensitizing-Solution), (for) Offset Duplication. Covers one type and one grade. Gives general requirements, alternate coating solution, and detail requirements; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 333C; 1943. Plate-Wash (Counter-Etch); Aluminum and Zinc (For) Offset Duplication. Covers one type and one grade. Plate wash shall be technical acetic acid intended for use in the treatment of metal plates (aluminum and zinc) prior to coating to obtain a clean surface. Gives methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 334B; 1943. Plates; Offset, Duplicating. Covers two types—type I, patterned edge, integral or detachable—class A, zinc; and B, plastic; and type II, straight edge—class A, zinc; and B, plastic. Gives requirements for mechanical properties and chemical composition of zinc plates, physical properties of plastic plates, workmanship, thickness and sizes, and graining; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 335C; 1943. Fountain Solution; Aluminum or Zinc Plate, (for) Offset Duplication. Two types—(I) aluminum and (II) zinc. Gives requirements for alternate solution, chemical compositions, and concentration; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 412C; 1944. Blankets; Offset-Press, Lithographic. Shall be of one type and suitable for both dry process printing from deep-etch plates and wet-process printing from coated plates. Gives requirements for material, suitability, construction, surface, over-all thickness, stretch, resistance to tackiness, performance, marking, bid sample, and hardness; methods of inspection and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 598; 1943. Gum Arabic Solution, (for) Offset Duplication. Covers one type and one grade intended for use as a "gum" and a protective coating for metal plates in the offset duplicating process. Shall be free from any objectionable odor and gives requirements for appearance and specific gravity; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 600; 1943. Blanket Powder, (for) Offset Duplication. Covers one type and one grade and shall be a mixture of talc and sulfur intended for use on rubber blankets. Gives requirements for soluble material, loss on ignition, fineness, and grit; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 602; 1942. Intensifier, (for) Offset Duplicating Plates. Covers one type and one grade intended for use on offset duplicating plates to provide longer runs. Gives requirements for practical performance test; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 604; 1943. Sealing-Compound (Washout Solution); Print (or Image), (for) Offset Duplication. Covers one type and one grade intended for use as a protective coating for printing of images on offset duplicating plates. Shall be a homogeneous solution of suitable asphalt in turpentine. Gives requirements for nonvolatile, water, grit, and performance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 628; 1943. Ammonium Dichromate; Technical Grade. Covers one type and one grade, in granular form, and not caked in containers. Intended for use in lithographic processes. Gives requirements for chemical composition, water-insoluble matter, and particle size; methods of sampling, inspection, and test; and packaging and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-68; 1921. Slip; Etching, Gamberger.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-77; 1921. Touche.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-18; 1929. Frame; Printing.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-20; 1929. Tray; Zinc.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-43; 1940. Machine; Developing, Black and White Printing Process, 30-Inch, Hand Operated, With Chest.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 16-4; 1936. Machine; Photocopying, With Accessories.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-2; 1940. Cabinet; Wall Type, Steel, for Print Shop. Type I—single-tier (24-case); type II—double-tier (48-case), and the grade shall be as specified. Gives requirements for materials, workmanship, finish, color, base construction, movable parts, top, back, overhead lighting fixture, body, working top, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-3; 1940. Cutters; Paper, and Print Shop. There shall be but one type and grade, and two classes; Class A—paper cutter with stand (cabinet), and class B—paper cutter without stand. Gives reauirements for material, workmanship, finish, color, base construction, details, knife, stand, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-4; 1940. Cabinet; Letterboard (for Standing Forms), for Print Shop. The cabinet shall be all steel and the grade shall be as herein specified. Gives requirements for materials, workmanship, finish, color, base construction, dimensions, openings, letterboards, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-6; 1940. Machine; Wirestitching, for Print shop. There shall be but one type and grade. Gives requirements for materials, workmanship, finish, color, base construction, safety devices, spare parts, type and capacity, electrical equipment, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-10; 1941. Rack; Chase, for Print Shop. Type I—single-deck, capacity 10 forms; type II—double-deck, capacity 20 forms; and shall be but of one grade described herein. Gives requirements for materials, workmanship, finish, color, base construction, detail requirements, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-11; 1941. Saw; Trimmer, for Print Shop. Type I—saw trimmer with stand; type II—saw trimmer without stand (bench model); and the grade shall be as specified. Gives requirements for materials, workmanship, finish, color, base construction, safety devices, motors, spare parts, detail requirements, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-12; 1940. Table; Imposing, Steel Lockup and Storage, for Print Shop. Type I—size 31 x 39 in.; type II—size 39 x 65 in.; and the tables shall be all steel as specified. Gives requirements for materials, workmanship, finish, color, base construction, detail requirements, dimensions, tolerances, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 66-MC-13; 1941. Table; Drying, With Drying Racks, for Print Shop. There shall be but one type and grade. Gives requirements for materials, workmanship, finish, color, base construction, detail requirements, inspection, and methods of test.

References.—Printing ink, electrotypes, *see* 933.2, 788; back lining paper for case making machines, plate wiping paper, oiled manila tympan paper, *see* 479.4; stereotype tissue and molding paper, *see* 476.25.

937. EDUCATIONAL SUPPLIES

937.1 BLACKBOARD CHALK

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R192-42; 1942. Crayons, Chalks, and Modeling Clays for School Use (Types, Sizes, and packaging). Includes drawing crayons, pastels, dustless chalk, molded chalk, colored chalk, and lecturers' chalk.

U. S. Gov., Federal Specification SS-C-638; 1943. Crayons; Chalk, White. Covers two types—(I) extruded (round and hexagonal) and (II) molded. Gives requirements for material and workmanship, composition, size, weight, and breaking strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

937.2 ERASERS

U. S. Gov., Veterans Administration. Specification VA-G-25a; 1936. Erasers; Rubber.

References.—Steel erasers, *see* 931.4.

937.3 KINDERGARTEN SUPPLIES

937.4 BLACKBOARDS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R75-29; 1929. Composition Blackboard. This recommendation establishes a list of standard stock items covering widths and lengths of black blackboard of cement asbestos backing, of wood-pulp backing, and of gypsum core backing, and green blackboard of wood-pulp backing. Sponsored by the National School Supplies and Equipment Assn.

References.—Blackboard slate, *see* 511.51.

937.9 MISCELLANEOUS EDUCATIONAL SUPPLIES

References.—Handwriting supplies, *see* 931; writing inks, *see* 933.1; composition books, *see* 481.

940-949 TOYS, ATHLETIC AND SPORTING GOODS, AND INSIGNIA

941. TOYS

Underwriters' Laboratories, Inc. Standard for Electric Toys, 1942. Covers portable toys which are operated, heated, or lighted electrically, and which are designed to be employed on lighting and/or appliance branch circuits of 125 volts or less, in accordance with the National Electrical Code. Does not cover Christmas-tree and decorative-lighting outfits, picture machines and projectors, toy transformers, nor appliances designed to operate from the secondary of a toy transformer at a potential of 25 volts or less. Gives requirements for design, construction, corrosion protection, mechanical assembly, insulating material, switches, transformers, automatic controls, motors, special safety features, supply connections, wiring, performance, rating, and marking.

References.—Toy transformers, *see* 713.5.

942. INDOOR AMUSEMENTS

943. ATHLETIC AND SPORTING GOODS

943.1 BALLS

Amateur Athletic Union of the U. S. Official Basketball Rules. Adopted by Jewish Welfare Board, Public Schools Athletic League of New York, American Sokol Union, German-American Athletic Union, Military Athletic League, Slovac Catholic Sokol, and Catholic Youth Organization. Includes material, size, and weight of ball.

American Bowling Congress. Rules and Regulations, 1944-45. Includes weight, size, and balance of balls.

National Basketball Committee of the U. S. and Canada. Representing the National Collegiate Athletic Assn. National Federation of High School Athletic Assn., Young Men's Christian Assn., Canadian Intercollegiate Athletic Union, Canadian Amateur Basketball Assn. Official Basketball Guide, BB45. Includes materials, size, and weights of balls for adults and for players below senior high school age; requirements for height of bounce; testing for resilience at factory; and stamping with air pressure required to give legal bounce.

National Collegiate Athletic Assn. The Official Foot Ball Guide, FB44. Ball. Requirements for materials of cover and bladder, construction, color, inflation pressure, shape, size, dimensions, and weight.

National Collegiate Athletic Assn. The Official Lacrosse Guide, LC44. Ball. Includes requirements for material, circumference, weight, and height of bounce.

National Collegiate Athletic Assn. The Official Soccer Guide, SO44. Ball. Requirements for casing, circumference, weight, and inflation pressure.

National Collegiate Athletic Assn. Official Swimming Guide With Official Rules for Swimming, Fancy Diving, and Water Polo, SW45. Water Polo Ball (Hard Ball). Requirements for size, shape, covering, and weight.

National Football League. Official Football Rules. Ball. Requirements for materials of cover and bladder, construction, color, inflation pressure, shape, size, dimensions, and weight.

U. S. Golf Assn. Rules for Golf, 1944-45. Includes requirements for form and make of golf clubs and balls.

U. S. Volley Ball Assn. Volley Ball Official Guide, VB45. Ball. Includes requirements for shape, covering, size, weight, and air pressure.

References.—Volley ball, water polo ball, soccer ball, basket ball, foot ball, *see* 069.1; lacrosse ball, golf ball, water polo ball, code ball, *see* 209.91.

943.2 GLOVES AND MITS

National Collegiate Athletic Assn. The Official Boxing Guide, BO45. Gloves. Requirements for pattern, weight, thumb length, cuff width, and padding.

References.—Baseball gloves, *see* 068.1.

943.3 MASKS, BASEBALL

943.4 BASES AND PLATES, BASEBALL

943.5 QUOITS AND HORSESHOES

943.6 MEGAPHONES

U. S. Gov., Navy Dept. Specification 37 M 4c; 1944. Megaphones; Hand.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-268B; 1943. Megaphone; M-64.

U. S. Gov., U. S. Maritime Commission. Specification 37-MC-2; 1943. Megaphones; Hard. Covers one type and grade. Gives requirements for sizes, materials, workmanship, construction, finish, assembly, physical requirements, and marking; sampling, inspection, and methods of test; packaging, packing, and marking.

943.7 LEATHER ATHLETIC GOODS

National Collegiate Athletic Assn. The Official Boxing Guide, BO45. Gloves. Requirements for pattern, weight, thumb length, cuff width, and padding.

References.—Baseball gloves, *see* 068.1; water polo ball, volley ball, soccer ball, basket ball, foot ball, *see* 069.1.

943.8 FISHING LINES AND ACCESSORIES

U. S. Gov., Army-Navy Aeronautical Specification AN-K-2; 1943. Kits; Fishing.

U. S. Gov., Navy Dept. Specification 37 H 14a; 1944. Hooks; Fish, Steel.

943.9 MISCELLANEOUS ATHLETIC AND SPORTING GOODS

943.91 Athletic Clothing

National Collegiate Athletic Assn. The Official Football Guide, FB44. Equipment. Includes requirements for knee pads; elbow pads; hand, wrist, or forearm protectors; thigh guards, shin guards, and braces; shoes and shoe cleats; and head protectors.

National Football League. Official Football Rules. Equipment. Includes requirements for thigh guards, shin guards and braces, knee pads, elbow pads, shoes with cleats, head protectors, and color of jerseys.

References.—Rayon knit athletic shirts and track pants, *see* 397.12; knit athletic shirts and polo shirts, *see* 309.4.

943.92 Athletic Outfits

943.93 Golf Goods

U. S. Golf Assn. Rules for Golf, 1944-45. Includes requirements for form and make of golf clubs and balls.

U. S. Golf Assn. Specifications for Markings on Iron Clubs, 1942. Includes requirements for marking golf clubs where scoring grooves are used, for scoring clubs with punch marks, and for marking clubs with combination of punch markings and groove.

References.—Golf Ball, hickory golf shafts, *see* 209.91, 429.9.

943.94 Field and Track Goods and Apparatus

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Barrel Head for Throwing the Heavy Weight for Height. Requirements for size and position.

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Cleats for Tug-of-War. Requirements for material, sizes, locations, and installation.

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Pegs and Cross-Bar. Requirements for material, size, and locations.

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Rope for Tug-Of-War. Requirements for material, kind, and size.

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Scratch Line for Javelin Throwing. Requirements for material, size, and installation.

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Take-Off for Pole Vault. Requirements for material, measurements, and installation.

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Throwing Circles. Requirements for sizes and interior surface for various throwing events.

Amateur Athletic Union of the U. S. Official Handbook. Athletic Rules Track and Field. Vaulting Standards. Requirements for uprights, cross bar, and pegs.

Amateur Athletic Union of the U. S. Specifications of Apparatus. Hammer Throwing Cage. Suggested requirements on diameter and height, size of opening, size of wire and mesh, size and setting of pipe frame.

Amateur Athletic Union of the U. S. Specifications of Apparatus. Hurdle. Requirements for construction of wood or metal, measurements, and finish.

Amateur Athletic Union of the U. S. Specifications of Apparatus. Jump Standards and Vaulting Standards. Requirements for uprights, for triangular wood cross bar and supports, shape, and dimensions.

Amateur Athletic Union of the U. S. Specifications of Apparatus. Relay Baton. May be made from hollow wood, fiber, or cardboard tube; measurements and weight.

Amateur Athletic Union of the U. S. Specifications of Apparatus. Sector Flags. Gives size and shape of metal flag, and standard to be colored red.

Amateur Athletic Union of the U. S. Specifications of Apparatus. Seven-Foot Circle. For circle made of band iron, steel, or wood; and except for the discus, shall measure 7 ft. inside diameter. For the discus, shall measure not more than 8 ft. 2 1/2 in. in inside diameter. Gives width and thickness of wood and of metal, and finish.

Amateur Athletic Union of the U. S. Specifications of Apparatus. Stop Board. For construction of wood, measurements, and finish.

Amateur Athletic Union of the U. S. Specifications of Apparatus. Take-Off Board. For construction of wood, measurements, and finish.

Amateur Athletic Union of the U. S. Specifications for Official Implements. Discus. Requirements for construction, measurements, and weight.

Amateur Athletic Union of the U. S. Specifications for Official Implements. Hammer. Requirements for head of lead or brass shell filled with lead or cast gray iron, handle of spring steel wire, grip, connections, weight, shape, and length.

Amateur Athletic Union of the U. S. Specifications for Official Implements. Javelin. Construction of steel or iron pointed wood javelin; requirements for center of gravity, length, grip, and weight.

Amateur Athletic Union of the U. S. Specifications for Official Implements. Pole Vaulting Pole. Material and dimensions not specified; requirements for adhesive tape wrapping and metal spike or wooden plug end.

Amateur Athletic Union of the U. S. Specifications for Official Implements. Shot. Requirements on shape, material, and weight.

Amateur Athletic Union of the U. S. Specifications for Official Implements. Standard (56-lb.) Heavy Weight. Requirements for head of lead or lead in brass shell, for handle, connection, and dimensions. The 35-lb. weight is exactly the same, except that the "s" shaped connection is 1 in. longer to make the overall length same as the heavy weight.

Amateur Athletic Union of the U. S. Specifications for Official Implements. Women's Discus. Gives approved standards for construction, measurement, and weight.

Amateur Athletic Union of the U. S. Specifications for Official Implements. Women's Javelin. Requirements for construction of iron or steel pointed wood javelin, for center of gravity, length, grip, and weight.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Discus. Requirements for construction, measurements, and weight.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Discus Circle. Requirements for diameter, material for ring, and surface within circle.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Hammer. Requirements for head, handle, grip, connections, weight, and length.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Hurdles. Requirements for material, base, uprights, frame, cross bars, width, and weight.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Javelin. Requirements for construction, grip, measurements, and weight.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Javelin Scratch Line. Requirements for material, dimensions, and location.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Pole Vault. Requirements for uprights, cross-bar, supports, pole, and box.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Running Broad Jump. Requirements for take-off area and take-off.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Running High Jump. Requirements for uprights, cross bar, and supports.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Seven-Foot Circle for Throwing Events. Requirements for ring, surface within ring, and toeboard.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Shot. For iron sphere, or spherical brass shell filled with lead. Leather or soft bag or container filled with lead for indoor competition.

Intercollegiate Assn. of Amateur Athletes of America. Official Handbook. Thirty-Five-Pound Weight. Requirements for head, handle, connection, weight, and length.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Broad Jump. Requirements for scratch-line and alighting pit, materials, and dimensions.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Discus. Requirements for shape, size, material, and weight for collegiate and for high school meets.

National Collegiate Athletic Assn. The Official Track and Field Guide. TF44. Hammer. Requirements for head, handle, and grips.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Hurdles. Includes requirements for length, width, and finish of top bar, weight, and spacings for various lengths of races for both high and low hurdles.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Javelin. Requirements for material, length, center of gravity, grip, length, and weight.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Relay Baton. Requirements for material, size, circumference, and weight.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Running High Jump and Pole vault. Requirements for sizes of pits, bar, supports for bar, standards, box for planting pit, and stopboard.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Shot. Requirements for material, shape, and weight.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Thirty-Five-Pound-Weight. Requirements for head, handles, length, and weight.

National Collegiate Athletic Assn. The Official Track and Field Guide, TF44. Throwing Circles. Requirements for sizes and materials for various throwing events.

References.—Relay baton, *see* 429.9.

943.95 Lacrosse Goods

National Collegiate Athletic Assn. The Official Lacrosse Guide, LC44. The Crosse. Includes requirements for length, material, leading string, and method of weaving.

National Collegiate Athletic Assn. The Official Lacrosse Guide, LC44. Goals. Includes requirements for spacing and height of poles and type and mesh of net.

References.—Lacrosse ball, *see* 209.91.

943.96 Hockey Goods and Apparatus

National Collegiate Athletic Assn. The Official Ice Hockey Guide, IH45. Goal Cages. Includes requirements for posts, top car or rope, base, and net.

National Collegiate Athletic Assn. The Official Ice Hockey Guide, IH45. Goalkeeper's Pads. Minimum width of leg pads.

National Collegiate Athletic Assn. The Official Ice Hockey Guide, IH45. Hockey Sticks. Includes requirements for material, length, blade heights, and blade length.

National Collegiate Athletic Assn. The Official Ice Hockey Guide, IH45. Puck for Ice Hockey. Includes requirements for material (vulcanized black rubber), thickness, diameter, and weight.

National Collegiate Athletic Assn. The Official Ice Hockey Guide, IH45. Skates. Requirements for blade extensions and blade ends.

References.—Hockey ball, hockey stick, puck, *see* 943.1, 429.9, 209.92.

943.97 Basket-Ball Goods and Apparatus

Amateur Athletic Union of the U. S. Official Basketball Rules. Adopted by Jewish Welfare Board, Public Schools Athletic League of New York, American Sokol Union, German-American Athletic Union, Military Athletic League, Slovac Catholic Sokol, and Catholic Youth Organization. Includes court dimensions and markings; size, material, and positions of backboards, baskets and basket rings; and materials, size, and weight of ball.

National Basketball Committee of the U. S. and Canada. Representing the National Collegiate Athletic Assn., National Federation of High School Athletic Assns., Young Men's Christian Assn., Canadian Intercollegiate Athletic Union, Canadian Amateur Basketball Assn. Official Basketball Guide, BB45. Includes court dimensions and markings; size, material and position of back boards, basket, and basket rings; materials, size, and weights of balls for adults and for players below senior high school age; height of bounce; and testing of balls for resilience at factory.

References.—Basket ball, *see* 069.1.

943.98 Bowling Goods and Apparatus

References.—Bowling ball, bowling pins, *see* 943.1, 429.9.

943.99 Athletic and Sporting Goods Not Elsewhere Classified

National Collegiate Athletic Assn. Official Boxing Guide, BO45. Ring. Requirements for size, padding of posts and turnbuckles, rope enclosure and padding for same, padding and covering for floor.

National Collegiate Athletic Assn. Official Swimming Guide With Official Rules for Swimming, Fancy Diving, and Water Polo, SW45. Springboards. Requirements for distance above water, length, width, material, covering, and location.

National Collegiate Athletic Assn. Official Swimming Guide With Official Rules for Swimming, Fancy Diving, and Water Polo, SW45. Water Polo Goals. Requirements for width, height of cross bar above water, and attachment.

U. S. Volley Ball Assn. Volley Ball Official Guide, VB45. Net. Includes requirements for width, length, mesh size, and material; binding of top, ends, and sides; height; and markers.

References.—Baseball bat, spring boards, *see* 429.9; volley ball and tennis nets, *see* 317.7.

944. BADGES, INSIGNIA, AND MARKINGS

944.1 BADGES

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 26-2. Badges; Fire Overhead.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-26-1. Badge; Forest Guard.

U. S. Gov., Marine Corps Specification, 1937. Badge; Basic.

U. S. Gov., Marine Corps Specification, 1937. Badge; Expert (Rifle).

U. S. Gov., Marine Corps Specification, 1937. Badge; Marksman (Rifle).

U. S. Gov., Marine Corps Specification, 1937. Badge; Sharpshooter (Rifle).

U. S. Gov., Marine Corps Specification, 1938. Bars; Good Conduct Medal.

U. S. Gov., Marine Corps Specification, 1937. Bar; Requalification, for Badge, Expert (Rifle).

U. S. Gov., Marine Corps Specification, 1940. Bars; Qualification.

U. S. Gov., Navy Dept. Specification 71B6; 1943. Badges; Arm.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Badges for Motor Vehicle Service Employees.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-1A; 1929. Badge; Aviation.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-13; 1931. Badge, for Excellency in Marksmanship and Bombing.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-14; 1931. Badge; Marksmanship, Team.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-15; 1931. Badge; Marksmanship, Gunnery, and Swordsmanship, Individual Qualification.

944.2 IDENTIFICATION TAGS

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-18A; 1941. Tag; Identification, M-1940.

944.3 INSIGNIA AND ORNAMENTS

U. S. Gov., Marine Corps Specification, 1942. Insignia; Recruiting, Dress.

U. S. Gov., Marine Corps Specification, 1943. Ornaments; Plastic, Cap and Hat (Enlisted Men).

U. S. Gov., Marine Corps Specification, 1943. Ornaments; Plastic, Collar (Enlisted Men).

U. S. Gov., Navy Dept. Specification 71D2; 1940. Devices; Cap.

U. S. Gov., Navy Dept. Specification 71M3a; 1944. Marks; Sleeve.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3210; 1944. Marking Insignia; Flying Clothing and Personal Equipment.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-3A; 1938. Insignia; Cap and Collar, Enlisted Men's.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-2B; 1942. Cord; Hat, General Officers', Officers', and Warrant Officers'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-8B; 1938. Cord; Hat, Enlisted Men's.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-12; 1930. Cord; Hat, for Citizens' Military Training Camp.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-S19; 1939. Insignia and Brassard; Embroidered.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-20; 1939. Insignia; Cap, for Flying Cadets.

944.4 FOURRAGERE

U. S. Gov., Marine Corps Specification, 1937. Fourragere; Wool.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-21; 1941. Fourragere; Wool.

944.5 DECALCOMANIA

U. S. Gov., Army Air Forces. Specification 14118B; 1944. Decalcomania; Aircraft.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Decalcomania.

U. S. Gov., Treasury Dept., Procurement Div., No. 687; 1944. Decalcomanias, for Interior Use. Covers one type and one grade. Gives requirements for design, size, color, directions for application, working properties and application, gasoline resistant properties, and opaqueness; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

944.6 METALS

U. S. Gov., Marine Corps Specification, 1938. Medal; Good Conduct.

U. S. Gov., Navy Dept. Specification 71M2; 1939. Medals (Miniature); Palms; Ribbon-Bars and Mountings; Ribbons; Rosettes; and Stars.

944.7 EMBLEMS

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Emblems.

950-959 CONTAINERS

950. GENERAL ITEMS

American Iron and Steel Institute. Packaging, Marking, and Loading Steel Products for Overseas Shipments, 1944. Covers general instructions, packaging detail code, protective coatings, packaging materials, and definitions of terms. Gives detail instructions concerning various types of ingots, blooms, billets, slabs, sheet bar, rods, skelp, plates, sheets, coils, can and drum stock, enameling stock, strip, tin and terne plate, bars, wire, structural shapes, railroad rails, tie plates and joint bars, track bolts and spikes, railroad axles, steel tubular products; tubing, rigid conduit, and finished aircraft and stainless tubing.

Consolidated Freight Classification Committee, No. 16. Rules for Packing and Shipping All Commodities Moving in Freight Transportation. Contains: Official Southern and Western classifications and ratings thereon, with detailed specifications for the required containers. The container specifications include requirements on materials, construction, strength of parts and marking and packing regulations. They cover wooden, metal, paper and fiberboard containers. Uniform bill-of-lading forms and livestock contracts, as prescribed by the Interstate Commerce Commission, are also included in the regulations.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet H-1, for Shippers and Consignees. Hydrofluoric Acid (HF). Recommended Practice for the Safe Handling and Discharging of Containers, 1942. Includes description of acid; recommended precautions; recommendations for containers, labels, rubber drums, lined and unlined steel drums, lead carboys, wood barrels, and tank cars for aqueous hydrofluoric acid; recommendations for unbrazed steel cylinders for anhydrous hydrofluoric acid; and facsimile of labels recommended for application to containers.

Manufacturing Chemists' Assn. of the U.S. Manual Sheet TC-5, for Consignees. Unloading Anhydrous Hydrofluoric Acid From Tank Cars. Recommended Practice, adopted 1943. Includes description of product, general precautions, placement of tank car for unloading, safety rules to be observed by unloaders, dome fittings, valve and fittings specifications, acid storage tank, compressed air when used for discharge of acid, unloading operations, removal or reversal of placards, return of empty cars, railroad defect and bad order cards, and service.

National Board of Fire Underwriters. Discharging Flammable Liquids From Tank Cars, No. 38; 1932. Recommended practice for unloading systems from railroad tank cars to storage tanks located within cities or towns, for liquids having a flash point below 70° F. Unloading distance from buildings, piping to storage tanks, storage tanks, operating requirements, and hazards involved.

Society of Automotive Engineers, Inc. Aeronautical Standard 338; 1945. Shipping Containers—Aircraft Engines and Components. To provide general information on the construction and application of a type of container suitable for either domestic or export shipment of aircraft engines and components. Covers materials and application, construction requirements, and marking.

Society of Automotive Engineers, Inc. Aeronautical Standard 339; 1945. Cover—Shipping Container Log Data and Inspection Port. Gives dimensional drawing with notes.

Society of Automotive Engineers, Inc. Aeronautical Standard 340; 1945. Cover—Shipping Container Inspection Port. Gives dimensional drawing with notes.

U. S. Gov., Army Air Forces. Specification 40569-A; 1944. Packaging and Packing of Miscellaneous Small Aircraft Parts.

U. S. Gov., Army Air Forces. Specification 40737 (1); 1944. Marking; Petroleum-Product Container (Domestic and Export).

U. S. Gov., Army Air Forces. Specification 40755-1; 1944. Marking; Shipment, Beneficiary Governments.

U. S. Gov., Army Air Forces. Specification 40839-A; 1945. Packaging and Packing of Aircraft Materiel in Steel Shipping Containers.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-13a; 1944. Preservation and Packaging; Parts and Equipment, General Specification for.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-62a; 1944. Packaging of Lightweight Aircraft Accessories.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Miscellaneous Publication M165; 1940. Standardization of Packages. The material included in this publication is a direct reprint from the National Bureau of Standards Miscellaneous Publication M164, Report of the Twenty-Ninth National Conference on Weights and Measures, and presents the full text of the report for the fifth and sixth sessions of the conference, which were devoted entirely to the subject of standardization of packages.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R60-43; 1943. Packaging of Carriage, Machine, and Lag Bolts. This recommendation establishes packing lists showing full-container quantity and approximate gross weight for each size and type of bolt covered, also the approximate weight per 100 bolts for each type and size of bolt. Initiated by the American Institute of Bolt, Nut, and Rivet Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R70-42; 1942. Salt Packages. This recommendation establishes a list of standard package sizes for pockets, cartons, burlap or cotton bags, and barrels for salt, sizes expressed in capacity in pounds of salt. Sponsored by the Salt Producers Assn.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Fill of Container. General methods for water capacity and fill of containers. Gives detailed method for determining fill of container for canned goods.

U. S. Gov., Federal Security Agency, Food and Drug Administration, S.R.A., F.D.C.2; 1944. Definitions and Standards for Food. Substandard Quality and Fill of Container. General statements of substandard quality and substandard fill of container. Gives details concerning these terms.

U. S. Gov., Federal Specification U-M-186; 1944. Medicinal Products and Clinical Laboratory Reagents; General Specification for Containers (Packaging and Packing). Gives requirements for types and classes, grades and sizes, material, workmanship, labeling, compatibility of container, and details for glass, metal, fiber, paper, plastic, and wood containers; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U.S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Freight. Includes definitions of explosives and dangerous articles other than explosives, accepted and forbidden, for transportation by common carriers by rail freight, rail express, highway, or water. Classification of explosives as—class A, dangerous explosives (ammunition for cannon, ammunition-nonexplosive, ammunition-projectiles, grenades, bombs, mines, and torpedoes, ammunition for small arms with explosive bullets, explosive chemical ammunition, black powder and low explosives, high explosives, and initiating or priming explosives); class B, less dangerous explosives (ammunition for cannon with empty, sand-loaded, or solid projectiles or without projectiles, fireworks, and smokeless powder); and class C, relatively safe explosives (ammunition for small arms, blasting caps, cordeau detonat, fuses, igniters, primers, safety fuse, and toy caps). Classification of dangerous articles other than explosives as—inflammable liquids, inflammable solids, and oxidizing materials; acids and other corrosive liquids, compressed gases, and poisonous articles—class A, extremely dangerous poisons; class B, less dangerous poisons; and class C, tear gas or irritating substances. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Joint Army-Navy Specification JAN-P-131; 1944. Packaging and Packing for Overseas Shipment—Barrier-Material; Moisture-Vaporproof, Flexible.

U.S. Gov., Army-Navy General Specification for Packaging and Packing for Overseas Shipment. U. S. Army 100-14A and U. S. Navy 39P16a; 1944.

References.—Skid platforms, *see* 959.9.

951. BARRELS, DRUMS, AND TUBS

951.1 BARRELS

951.10 General Items

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, undated. General Barrel Information. Covers loading barrels for railroad shipment, tools used for barrels, measurements and capacities, and dictionary of cooperage terms.

Assn. of American Railroads, Perishable Div., Freight Container Bureau. Freight Container Bureau Tariff No. 3-A Southeast Territory. Specifications of Standard Containers and Loading Rules for Fresh Fruits, Berries, Vegetables, and Melons, effective June 15, 1940 (issued by J. J. Quinn, agent) and Supplements Nos. 8 (effective May 10, 1941), 9 (effective Sept. 12, 1941), 12 (effective Mar. 2, 1942), 13 (effective Apr. 2, 1942), and 14 (effective June 10, 1942).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C64; 1917. Rules and Regulations for Enforcement of the Lime Barrel Act. Mandatory requirements on shipment or lime in interstate of foreign commerce, net weight requirements for two standard barrel sizes and of other containers of less capacity than small barrel, marking and tagging requirements, copy of act included.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C71; 1917. Rules and Regulations

Promulgated Under Authority of the Federal Standard Barrel Law. Gives the capacity of the standard barrel as fixed by law for fruits, vegetables, and other dry commodities (not including lime barrels) and of the standard barrel for cranberries, establishes dimensions of standard barrels and fractional barrel, length of stave, etc., tolerances. Copy of Standard Barrel Act included.

951.11 Fiber Barrels

References.—Standard barrel sizes and dimensions, *see* 951.10; container fiberboard, *see* 472.93; standard thicknesses, methods of testing fiberboard, *see* 472.0, 470.3.

951.12 Metal Barrels

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R20-28; 1928. Steel Barrels and Drums. This recommendation establishes a schedule of stock types and capacities of steel barrels and drums as follows—standard light shipping drums, standard I.C.C., bolted cover light, friction cover light, and grease drums; and bilge barrels. Sponsored by Steel Barrel Manufacturers' Council.

U. S. Gov., Federal Specification RR-B-116a; 1941. Barrels; Steel, Type 5. Covers bilged barrels, 55 gallons rated capacity; four types—(I) brazed chime, (II) seamless chime, (III) welded chime, and (IV) double-seam chime. Stipulates compliance with the Shipping Container Specification 5, Steel Barrels of the U. S. Gov., Interstate Commerce Commission. Gives requirements for material, workmanship, dimensions, weight, capacity, properties, sheet steel, construction, chimes, bung, vent, flanges, plugs, gaskets, removable head, and coating; methods of sampling, inspection, and tests; and requirements for marking.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities of not over 5, 10, and 33 gal. for straight side type without rolling hoops; 33, 55, and 110 for straight side type with U-rolling hoops and with I-bar rolling hoops; 33 and 55 gal. for straight side type with rolled or swedged-in rolling hoops; and 33 and 55 gal. for bilge type without rolling hoops. Includes requirements for material, (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assn., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5A. Steel Barrels or Drums (Removable Head Containers Not Authorized). Capacities of not over 10 gal. for straight side type without rolling hoops; 30, 55, and 110 gal. for straight side type with I-bar type rolling hoops; and 30 and 55 gal. for bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5B. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities of not over 5 and 10 gal. for straight side type without rolling hoops; 33, 55, and 110 gal. for straight side type with rolled or swedged-in type rolling hoops; and 33 and 35 gal. for bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5C. Steel Barrels or Drums (Removable Head Containers Not Authorized). Capacities of not over 15 gal. for straight side type without rolling hoops; 30, 55, and 110 gal. for straight side type with I-bar type rolling hoops; and 30 and 55 gal. for bilge type without rolling hoops. Includes requirements for material (18-chrome, 8-nickel alloy) construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5D. Steel Barrels or Drums—Rubber-Lined (Removable Head Containers Authorized). Similar to I.C.C. Specification 5A. Steel Barrels or Drums (referred to herein), except rubber-lined. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5G. Steel Barrels or Drums (Removable Head Containers Not Authorized). Capacities not over 5, 10, and 33 gal. for straight side type without rolling hoops; 33, 55, and 110 gal. for straight side type with U-type rolling hoops and with I-bar type rolling hoops; 33 and 55 gal. for straight side type with rolled or swedged-in type rolling hoops; and 33 and 55 gal. for bilge type without rolling hoops. Includes requirements for material (austenitic 18- and 8-chrome nickel alloy with carbon content not over 0.08 percent), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5H. Steel Barrels or Drums—Head-Lined (Removable Head Containers Not Authorized). Similar to I.C.C. Specification 5A, Steel Barrels or Drums (referred to herein), except lead-lined. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5K.

Nickel Barrels or Drums (Removable Head Containers Not Authorized). Similar to I.C.C. Specification 5A, Steel Barrels or Drums (referred to herein), except material requirement of 99.0 percent pure nickel. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Freight. Shipping Container Specification 5L. Steel Barrels or Drums (Removable Head Containers Not Authorized). Covers requirements for capacity, material, construction, marking, and tests. Published by American Trucking Assn., Inc., Tariff Bureau, and Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5X. Steel Drums—Aluminum-Lined (Removable Head Containers Not Authorized). Similar to I.C.C. Specification 5A, Steel Barrels or Drums (referred to herein), except aluminum-lined. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U.S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 6A. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities 5 to 10 gal. for straight side type without rolling hoops; 5 to 30 and 5 to 55 gal. for straight side type with I-bar type rolling hoops; and 5 to 33 and 5 to 55 gal. bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 6B. Steel Barrels or Drums (Removable Head Container Authorized). Capacities 5 to 10 gal. for straight side type without rolling hoops; 5 to 30 and 5 to 55 gal. for straight side type with U-type rolling hoops; 5 to 30, 5 to 55, and 5 to 110 gal. for straight side type with I-bar type rolling hoops; and 5 to 33 and 5 to 55 gal. for bilge type without rolling hoops. Includes requirements on material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 6J. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities 5 to 30 and 5 to 55 gal. for straight side type with rolled or swedged-in type rolling hoops; 5 to 55 gal. for straight side type with U-type rolling hoops; 5 to 55 gal. for straight side type with I-bar type rolling hoops; and 5 to 33 and 5 to 55 gal. for bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles, Shipping Container Specification 17X. Steel Barrels or Drums, Single-Trip Container (Removable Head Containers Not Authorized). Includes requirements for capacity, material, construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 42C. Aluminum Barrels or Drums. Similar to I.C.C. Specification 42B, Aluminum Drums, except requirements for parts and dimensions and for marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 100-6; 1927. Container, for Inflammable Liquids, Acids or Solids, Barrels or Drums.

References.—Standard barrel sizes and dimensions, *see* 951.10; iron and steel sheets, *see* 604.2; aluminum sheets, *see* 631.23; zinc coatings, *see* 600.3.

951.13 Wooden Barrels

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Woodenware and Cooperage. For pork barrels, requirements on kinds of wood, inside coating of paraffin, dimensions of staves and heads, number and dimensions of galvanized iron hoops.

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, undated. Slack Barrels. Gives slack barrel diagram and covers selecting the proper barrel for your product, opening and closing a barrel, handling and storing barrels, Interstate Commerce Commission regulations, grade rules and specifications for export barrels, export barrels for dried skim milk, and bag liners and head liners.

Associated Cooperage Industries of America, Inc. Wooden Barrel Manual, undated. Tight Barrels. Gives tight barrel diagram and covers selecting the proper barrel for your product, opening and closing a barrel, handling and storing barrels, Interstate Commerce Commission regulations, grade rules and specifications circled tight barrel heading, square tight barrel heading, specifications for export barrels, and use of linings.

Assn. of American Railroads, Freight Container Bureau. Circular 21-1927. Slack Barrels and Inside Packing for Glass Tableware. Gives requirements for slack barrels, inside packing, sizes of barrels being used, grouping of woods, defects in material, manufacture of staves, heading, and hoops; manufacture of the container, discussion of inside packing, and additional important considerations.

U. S. Gov., Federal Specification NN-B-112; 1944. Barrels; Wood, Tight (for Liquids). Covers three types—(I) I.C.C. Type 10A, (II) I.C.C. Type 10B, and (III) I.C.C. Type 10C; five capacities—5, 10, 15, 30, and 50 gal.; and two grades—(A) all heartwood and (B) heartwood and sapwood. Gives requirements for wood species, defects, wood grain, sapwood, moisture content, tensile strength of steel hoops, workmanship, staves, heading, inside surfaces, capacity, pressure test, closure, type test, and details; methods of sampling, inspection, and tests; and marking for shipment.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 10A. Wooden Barrels and Kegs (Tight). Includes requirements for materials, construction, closures, lining, tests, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 10B and 10C. Wooden Barrels and Kegs. Similar to I.C.C. Specification 10A, Wooden Barrels and Kegs (Tight), except thickness of staves, head, and hoops. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 11A and 11B. Wooden Barrels and Kegs (Slack). Includes requirements for materials, construction, marking, and closing. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Joint Army-Navy Specification JAN-P-122; 1944. Packaging and Packing for Overseas Shipment—Barrels; Slack. For barrels whose weight of contents does not exceed 1,000 lbs.

References.—Standard barrel sizes and dimensions, *see* 951.10; staves, headings and hoops, *see* 421.0-421.3; iron and steel hoops, *see* 604.22.

951.2 CASKS AND TIERCES

951.21 Metal Casks

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Motor, Rail, and Water. Shipping Container Specification MC200. Containers for Liquid Nitroglycerin. Covers requirements for motor vehicle body, inside containers, and boots. Published by American Truck Assns., Inc., Tariff Bureau.

951.22 Wooden Casks

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Woodenware and Cooperage. For 1,450-lb. curing casks, requirements on dimensions of oak staves and pine bottoms, with an alternate standard of dimensions, bilge diameter, number, and dimensions of hoops.

References.—Staves, headings and hoops, *see* 421.0-421.3; iron and steel hoops, *see* 604.22.

951.23 Metal Tierces

951.24 Wooden Tierces

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Woodenware and Cooperage. For lard and pickled meat tierces, requirements for kinds of seasoned oak, interior coating, dimensions of staves and head, size and number of iron hoops, and capacity; for pickled meat tierces. White ash or birch may also be used.

U. S. Gov., Marine Corps Specification, 1941. Tierce, New.

References.—Staves, headings and hoops, *see* 421.0-421.3; iron and steel hoops, *see* 604.22.

951.3 DRUMS

951.31 Fiber Drums

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No.7. Contains requirements for fiber drums for shipment of licorice. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No.7-1943.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 21A. Fiber Drums. Includes requirements for construction, tests, registration of drum specifications, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 21B. Fiber Drums. Covers requirements for capacity, construction, tests, registration of drum specification, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

References.—Container fiberboard, *see* 472.93; standard thicknesses, methods of testing fiberboard, *see* 472.0, 470.3.

951.32 Metal Drums

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Lard Cans. Include round cans for domestic trade; 2-, 4-, and 8-lb. pails with friction slip covers, 45- to 120-lb. metal cans or drums; and square cans for export trade, requirements on dimensions, design, weight of tin plate, gauge of wire handles, and seam details.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet D-30 (for Shippers). Drums; Steel (I.C.C.-5A)—Unlined—Service Requirements (When Used for Shipping Sulphuric Acid and Mixed Sulphuric and Nitric Acids). Recommended Practice, adopted 1932. Includes recommendations for handling; torch flames, sparks, smoking, etc.; serviceability; removal and replacement of body plug; treatment of body plug and body plug flange threads; inspection, classification, and storage of empty drums; draining, cleaning, and interior washing; testing; repairing; filling; outage; storing of filled drums; venting full drums; warning label; and shipping.

Manufacturing Chemists' Assn. Manual Sheet D-31 (for Consignees). Drums, Steel (I.C.C.-5A)—Handling and Storing When Filled With, or Last Containing Acid Corrosive Liquids. Recommended Practice, adopted 1932, revised 1943. Includes recommendations for handling, storing, venting, removal and replacement of body plug, torch flames, sparks, smoking, etc.; emptying, draining and closing, internal washing, and return.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet D-33 (for Shippers and Consignees). Drums, Steel (I.C.C.-5E) (When Used for Shipping Inflammable Liquids Flashing Between 20° and 80° F.). Recommended Practice, adopted 1936. Includes recommendations for outage, removal and replacement of plug, weight limitation, marking, standard dimensions, warning label, handling, storing, and shipping.

Standard, adopted 1932, revised 1935, 1940. D-38—for Drums Containing Inflammable Volatile Liquids; Standard, adopted 1936. D-39—for Drums Containing Aqua Ammonia; Standard, adopted 1938. Facsimile of labels furnished by Manufacturing Chemists' Assn. of the U. S. upon receipt of orders.

U. S. Gov., Army Air Forces. Specification 40667-A (1); 1943. Drum; 55-Gallon Steel, for Fuel and Oil.

U. S. Gov., Army Air Forces. Specification 40854A-1944. Drum; 55-Gallon Aluminum, for Fuel and Oil.

U.S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 203-44; 1944. Containers and Packages for Household Insecticides (Liquid Spray Type). Gives various dimensions for retail packages (Boston round bottle and glass jug) for pint, quart, gallon bottle, and gallon jug; and covers industrial packages (5-gal. and 54-gal. steel drums). Sponsored by National Assn. of Insecticide and Disinfectant Mfrs., Inc.

U. S. Gov., Federal Specification RR-D-701; 1932. Amendment 2; 1936. Drums; Metal, Types 5A, 5C, and 5D (for Acids and Other Dangerous Articles). Shall comply with Specifications of the U. S. Gov., Interstate Commerce Commission. Gives requirements for capacity, properties of drum, construction, rolling hoops, bung, vent, flanges, plugs, gaskets, coating, dimensions, and lining; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification RR-D-726a; 1941. Drums; Steel, Type 5 (for Inflammable or Poisonous Liquids). Covers four types, straight side, cylindrical drum—(I) brazed chime, (II) seamless chime, (III) welded chime, and (IV) double-seam chime. Shall comply with Specifications of the U. S. Gov., Interstate Commerce Commission. Gives requirements for capacity, properties of drum, construction, rolling hoops, bung, vent, flanges, plugs, gaskets, coating, dimensions, and lining; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-RR-D-726a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for weight of drums and coating.

U. S. Gov., Federal Specification RR-D-736; 1932. Drums; Steel, Type 6A (for Phosphorus, White or Yellow). Covers straight side, cylindrical, 30-gal. capacity sheet steel drums. Shall comply with Specifications of the U. S. Gov., Interstate Commerce Commission. Gives requirements for capacity, properties of drum, construction, rolling hoops, bung, vent, flanges, plugs, gaskets, coating, dimensions, and lining; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification RR-D-741a; 1941. Drums; Steel, Type 6C (for Inflammable Solids or Oxidizing Materials). Covers straight side, cylindrical, 55- and 110-gal. drums. Shall comply with specifications of the U. S. Gov., Interstate Commerce Commission. Gives requirements for capacity, properties of drum, construction, rolling hoops, bung, vent, flanges, plugs, gaskets, coating, dimensions, and lining; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification RR-D-746; 1932. Drums; Steel, Type 6D (for Inflammable Solids or Oxidizing Materials), Single-Trip Container. Covers straight side, cylindrical, 55-gal. capacity drums. Shall comply with Specifications of the U. S. Gov., Interstate Commerce Commission. Gives requirements for capacity, properties of drum, construction, rolling hoops, bung, vent, flanges, plugs, gaskets, coating, dimensions, and lining; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification RR-D-761; 1938. Drums and Pails; Steel, I.C.C. Type 5E, 5-Gallon, Single-Trip Container. Covers straight-side, cylindrical form; in three types—(I) drum with flanged-cap closure, (II) with twist cap closure, and (III) pail with cover. Shall comply with Specifications of the U. S. Gov., Interstate Commerce Commission. Gives requirements for capacity, properties of drum, construction, rolling hoops, bung, vent, flanges, plugs, gaskets, coating, dimensions, and lining; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-RR-D-761; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for inside coating, spout, closure, and class F ring seal cover.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities of not over 5, 10, and 33 gal. for straight side type without rolling hoops; 33, 55, and 110 gal. for straight side type with U-rolling hoops and with I-bar rolling hoops; 33 and 55 gal. for straight side type with rolled or swedged-in rolling hoops; and 33 and 55 gal. for bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5A. Steel Barrels or Drums (Removable Head Containers Not Authorized). Capacities of not over 10 gal. for straight side type without rolling hoops; 30, 55, and 110 gal. for straight side type with I-bar type rolling hoops; and 30 and 55 gal. for bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5B. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities of not over 5 and 10 gal. for straight side type without roller hoops; 33, 55, and 110 gal. for straight side type with rolled or swedged-in type rolling hoops; and 33 and 35 gal. for bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5C. Steel Barrels or Drums (Removable Head Containers Not Authorized). Capacities of not over 15 gal. for straight side type without rolling hoops; 30, 55, and 110 gal. for straight side type with I-bar type rolling hoops; and 30 and 55 gal. for bilge type without rolling hoops. Includes requirements for material (18-chrome, 8-nickel alloy), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5D. Steel Barrels or Drums—Rubber-Lined (Removable Head Containers Authorized). Similar to I.C.C. Specification 5A, Steel Barrels or Drums (referred to herein), except rubber-lined. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5F. Steel Drums (Removable Head Containers Not Authorized). Capacity not over 11 gal. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5G. Steel Barrels or Drums (Removable Head Containers Not Authorized). Capacities not over 5, 10, and 33 gal. for straight side type without rolling hoops; 33, 55, and 110 gal. for straight side type with U-type rolling hoops and with I-bar type rolling hoops; 33 and 55 gal. for straight side type with rolled or swedged-in type rolling hoops; and 33 and 55 gal. for bilge type without rolling hoops. Includes requirements for material (austenitic 18- and 8-chrome nickel alloy with carbon content not over 0.08 percent), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5H. Steel Barrels or Drums—Head-Lined (Removable Head Containers Not Authorized). Similar to I.C.C. Specification 5A, Steel Barrels or Drums (referred to herein), except lead-lined. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5K. Nickel Barrels or Drums (Removable Head Containers Not Authorized). Similar to I.C.C. Specification 5A, Steel Barrels or Drums (referred to herein), except material requirement of 99.0 percent pure nickel. Published by American Trucking Assns., Inc. Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Freight. Shipping Container Specification 5L. Steel Barrels or Drums (Removable Head Containers Not Authorized). Covers requirements for capacity, material, construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 5X. Steel Drums—Aluminum-Lined (Removable Head Containers Not Authorized). Similar to I.C.C. Specification 5A, Steel Barrels or Drums (referred to herein), except aluminum-lined. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 6A. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities 5 to 10 gal. for straight side type without rolling hoops; 5 to 30 and 5 to 55 gal. for straight side type with I-bar type rolling hoops; and 5 to 33 and 5 to 55 gal. bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 6B. Steel Barrels or Drums (Removable Head Container Authorized). Capacities 5 to 10 gal. for straight side type without rolling hoops; 5 to 30 and 5 to 55 gal. for straight side type with U-type rolling hoops; 5 to 30, 5 to 55, and 5 to 110 gal. for straight side type with I-bar type rolling hoops; and 5 to 33 and 5 to 55 gal. for bilge type without rolling hoops. Includes requirements on material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 6C. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities 5 and 5 to 10 gal. for straight side type without rolling hoops; 5 to 30, 5 to 55, and 5 to 110 gal. for straight side with U-type rolling hoops; 5 to 30, 5 to 55, and 5 to 110 gal. for straight side type with I-bar type rolling hoops; and 5 to 33 and 5 to 55 gal. for bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 6J. Steel Barrels or Drums (Removable Head Containers Authorized). Capacities 5 to 30 and 5 to 55 gal. for straight side type with rolled or swedged-in type rolling hoops; 5 to 55 gal. for straight side type with U-type rolling hoops; 5 to 55 gal. for straight side type with I-bar type rolling hoops; and 5 to 33 and 5 to 55 gal. for bilge type without rolling hoops. Includes requirements for material (low carbon, open hearth, or electric steel), construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 17C and 17E. Steel Drums; Single-Trip Container (Removable Head Containers Authorized). Both similar to I. C. C. Specification 5A, Steel Barrels or Drums (referred to herein). Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 17F. Steel Drums, Single-Trip Containers. Covers composition, chime reinforcement, parts and dimensions, rolling hoops, and convex heads. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 17X. Steel Barrels or Drums, Single-Trip Container (Removable Head Containers Not Authorized). Includes requirements for capacity, material, construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 37D, 37F, 37F, 37G, and 37H. Steel Drums, Single-Trip Containers (Removable Head Containers Authorized). Includes requirements for capacities, material, construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 42B. Aluminum Drums. Includes requirements for capacity, material, construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 42C. Aluminum Barrels or Drums. Similar to I. C. C. Specification 42B, Aluminum Drums, except requirements for parts and dimensions, and for marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 42D. Aluminum Drums. Similar to I. C. C. Specification 42B, Aluminum Drums, except requirements for parts and dimensions, closures, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Motor, Rail, and Water. Shipping Container Specification MC200. Containers for Liquid Nitroglycerin. Covers requirements for motor vehicle body, inside containers, and boots. Published by American Trucking Assns., Inc., Tariff Bureau.

U. S. Gov., Joint Army-Navy Specification JAN-P-110; 1944. Packaging and Packing for Overseas Shipment—Drums; Metal, 55-Gallon (for Other Than Petroleum Products).

U. S. Gov., Panama Canal, Purchasing Dept. Specification for 10-Gallon Drums for Paint; 1934.

U. S. Gov., Treasury Dept., Procurement Div., No. 630; 1944. Plugs, for Steel Drums. Covers two types—(I) plugs for flat gaskets (class A, pressed steel and class B, cast iron) and (II) plugs for square-and-round-section gaskets (class C, pressed steel; class D, cast iron; and class E, die cast zinc alloy). Gives requirements for sizes, cap seals, material, workmanship, construction, thread, holes for wire seal, cap seals, finish, marking, and details for each type and class; methods of sampling, inspection, and tests; packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 100-6; 1927. Container, for Inflammable Liquids, Acids or Solids, Barrels or Drums.

References.—Iron and steel sheets, *see* 604.2; aluminum sheets, *see* 631.23; zinc coatings, *see* 600.3; sizes and threading of flanges and plugs, *see* 951.12.

951.33 Wooden Drums

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 22A and 22B. Wooden Drums; Glued Plywood. Includes requirements for lumber, construction, tests, marking, and closing for shipment. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Joint Army-Navy Specification JAN-P-112; 1944. Drums; Plywood.

951.34 Rubber Drums

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 43A. Rubber Drums. Includes requirements for capacity, material, construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

951.4 FIRKINS AND KEGS

951.41 Metal Firkins

951.42 Wooden Firkins

951.43 Metal Kegs

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 13. Metal

Kegs. Includes requirements for material, closures, marking, tests, filling with contents, and additional kegs. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Motor, Rail, and Water. Shipping Container Specification MC200. Containers for Liquid Nitroglycerin. Covers requirements for motor vehicle body, inside containers, and boots. Published by American Trucking Assns., Inc., Tariff Bureau.

References.—Iron and steel sheets, *see* 604.2; methods of testing, general requirements for metals, *see* 600.1.

951.44 Wooden Kegs

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 1C. Carboys in Kegs. Includes requirements for wooden keg outside containers and tests. Published by American Trucking Assn., Inc., Tariff Bureau, and by Assns.,of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 10A. Wooden Barrels and Kegs (Tight). Includes requirements for materials, construction, closures, lining, tests, and marking. Published by American Trucking Assns.. Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 10B and 10C. Wooden Barrels and Kegs. Similar to I.C.C. Specification 10A, Wooden Barrels and Kegs (Tight), except thickness of staves, head, and hoops. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 11A and 11B. Wooden Barrels and Kegs (Slack). Includes requirements for materials, construction, marking, and closing. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Joint Army-Navy Specification JAN-P-134; 1944. Packaging and Packing for Overseas Shipment—Kegs; Slack. For kegs whose weight of contents does not exceed 300 lb.

References.—Staves, headings and hoops, *see* 421.0, 421.3; iron and steel hoops, *see* 604.22.

951.45 Fiber Firkins

References.—Container fiberboard, *see* 472.93; standard thicknesses, methods of testing fiberboard, *see* 472.0, 470.3.

951.46 Fiber Kegs

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 13A. Fiber Kegs. Covers requirements for construction, closures, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

951.5 HOGSHEADS

References.—Staves, headings and hoops, *see* 421.0, 421.3; iron and steel hoops, *see* 604.22.

951.6 KITS AND PAILS

951.61 Metal Kits

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2A. Inside Containers—Metal Cans, Pails, and Kits. Includes requirements for capacity,thickness of metal, test, and closure. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

References.—Iron and steel sheets, *see* 604.2.

951.62 Wooden Kits

U. S. Gov., Army Air Forces. Specification 40467 (1); 1943. Kit; Barber's Supply, Type L-1.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 18B. Wooden Kits. Includes requirements for construction, tests, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

951.63 Fiber Pails

References.—Container fiberboard, *see* 472.93; standard thicknesses, methods of testing fiberboard, *see* 472.0, 470.3.

951.64 Metal Pails

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Lard Cans. Include round cans for domestic trade; 2-, 4-, and 8-lb. pails with friction slip covers, 45- to 120-lb. metal cans or drums;and square cans for export trade, requirements on dimensions, design, weight of tin plate, gage, of wire handles, and seam details.

Assn. of American Railroads, Purchases and Stores Div. Coal Hod, 1934. Covers dimensions, metal gage, and illustration of standard hod conforming to Simplified Practice Recommendation No. 55 of the National Bureau of Standards, U. S. Dept. of Commerce.

Assn. of American Railroads, Purchases and Stores Div. Twelve-Quart Pail and Fire Bucket, 1934. Gives dimensional requirements and illustrations for standard pail, with lid to use as sponge bucket, and with crowned bottom for use as fire bucket. Conforms to Simplified Practice Recommendation No. 55 of the National Bureau of Standards, U. S. Dept. of Commerce.

Underwriters' Laboratories, Inc. Standard for Fire Pails, 1917. Recommends use of 12-qt. size, also covers 10- and 14-qt. size. Wrought iron or steel not less than No. 28 gage, or properly impregnated fiber reinforced where necessary. Lock or equivalent tight joints, soldered or galvanized tight, gage of handles, ears, beaded edge, bottom rim, covers, painting, and marking.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-15. Pail and Cover; Half-Oval.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-16. Pails and Covers; Round, Tin, Nestable.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification NSF-247-17-S. Pails and Covers; Round, Aluminum, Nestable.

U. S. Gov., Federal Specification RR-B-761; 1940. Buckets (Pail); Hospital, Corrosion-Resisting Steel. Covers one grade and two types—(I) with cover and (II) without cover. Gives requirements for material, workmanship, construction, design, dimensions, tolerances, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-B-771a; 1939. Buckets; Metal, Galvanized. Covers one grade and two types—(I) light weight and (II) heavy weight. Gives requirements for body, bail, ears, galvanizing, capacities, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-RR-B-771A; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for finishes and gives requirements for enameled, lacquered, and painted surfaces and finishes.

U. S. Gov., Federal Specification RR-B-784; 1939. Buckets; Metal, Tinned. Covers one type and grade. Gives requirements for weight of coating, capacities, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-RR-B-784; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted Federal Specification RR-B-771 for Buckets; Metal, Galvanized.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2A. Inside Containers—Metal Cans, Pails, and Kits. Includes requirements for capacity, thickness of metal, test, and closure. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Joint Army-Navy Specification JAN-P-124; 1944. Packaging and Packing for Overseas Shipment—Cans and Pails; Metal.

U. S. Gov., Navy Dept. Specification 42P10; 1943. Pails; Putty.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2446; 1938. Bucket; Enamelware.

U. S. Gov., U. S. Army, Medical Dept. Specification 29-49A; 1941. Bucket; Galvanized-Iron, Square.

U. S. Gov., U. S. Maritime Commission. Specification 42-MC-3; 1942. Containers (Pails); Steel, Watertight, (for) Lifeboat and Life Raft Blankets. There shall be but one type and grade. Gives requirements for materials, workmanship, capacity, dimensions, style, sheet steel, construction, handle, cover, lever closure, finish, water-tightness, sampling, inspection, and method of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-8; 1941. Buckets; Water, Galvanized. Type I—light-weight buckets; type II—heavy-weight buckets; and shall be but one grade. Gives requirements for material, workmanship, body, bottom, bail, ears, galvanizing, watertightness, marking, body, bottom, steel thickness, capacity, dimensions, inspection, and methods of test.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-38; 1941. Pails; Water, Enamelware, Seamless. Pails shall be of one type and grade, and sizes shall be as specified. Gives requirements for sheet steel, workmanship, pails, sides, top edge, bottoms, ears, bail, handle, enameling, reflectance, color, dimensions and capacities, sampling, inspection, and tests.

U. S. Gov., Veterans Administration. Specification VA-G-166a; 1937. Pails; Aluminum, Capacity 14 Qt.

U. S. Gov., Veterans Administration. Specification VA-G-221a; 1937. Pails; Aluminum, Capacity 16 Qt.

U. S. Gov., Veterans Administration. Specification VA-G-289; 1937. Pail; Aluminum, Capacity 10 Qt.

References.—Iron and steel sheets, *see* 604.2; zinc coatings, tin coatings, *see* 600.3.

951.65 Wooden Pails

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Buckets; Grease.

951.66 Fiber Kits

References.—Container fibre board, *see* 472.93.

951.7 TUBS

951.71 Metal Tubs

References.—Tubs special to laundries, *see* 787.

951.72 Wooden Tubs

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R135 32; 1932. Wooden Butter Tubs. This recommendation establishes a simplified schedule of capacities and dimensions for stock varieties of wooden butter tubs. Sponsored by the American Butter Institute.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No. 7. Contains requirements for wooden tubs for shipment of butter. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No. 7-1943.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 31. Jugs in Tubs. Includes requirements for material, size, construction, cushioning, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

References.—Tubs special to laundries, *see* 787.

951.73 Fiber Tubs

952. BASKETS AND HAMPERS

952.1 BASKETS

952.10 General Items

Assn. of American Railroads, Perishable Div., Freight Container Bureau. Freight Container Bureau Tariff No. 3-A Southeast Territory. Specifications of Standard Containers and Loading Rules for Fresh Fruits, Berries, Vegetables, and Melons, effective June 15, 1940, (issued by J. J. Quinn, agent) and Supplements Nos. 8 (effective May 10, 1941), 9 (effective Sept. 12, 1941), 12 (effective Mar. 2, 1942), 13 (effective Apr. 2, 1942), and 14 (effective June 10, 1942).

References.—Baskets used as standard capacity measures, *see* 919.1.

952.11 Fruit, Vegetable, and Berry Baskets

Assn. of American Railroads, Freight Container Bureau. Bulletin 25-1932. Climax Basket. For use in shipment of grapes and other fruits and vegetables, mainly in 12-qt. size, but also made in 2-qt. and 4-qt. sizes; requirements of the U. S. Container Act of 1916 for design, and dimensions, illustrations of common failures, loading, wire and wood handles, and suggested improvements.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 104. Revised, 1941. Rules and Regulations of the Secretary of Agriculture Under the U. S. Standard Container Act of Aug. 31, 1916 (39 Stat. 673), as amended June 11, 1934 (48 Stat. 930). Covers climax baskets, berry boxes, and till baskets. Gives tolerances and variations; and gives definitions and text of act to fix standards for climax baskets for grapes and other fruits and vegetables, and for mushrooms; and baskets or other containers for small fruits, berries, and vegetables.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 116. Amendments 1 and 2; 1936. Rules and Regulations of the Secretary of Agriculture Under the U. S. Standard Container Act of 1928. Gives definitions, specifications, tolerances, and variations for hampers, round stave baskets, and splint or market baskets for fruits, vegetables, and for other purposes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Berry Baskets or Boxes. Baskets or boxes for berries or small fruits, of a capacity of 1 dry quart or less, shall be of one of the following sizes: 1 qt., 1 pt., or 1/2 pt., dry measure. Allowable tolerances are given for baskets or boxes made of wood, pasteboard, or fiber.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No. 7. Contains requirements for baskets for shipment of fresh fruits or vegetables, meats, and tobacco. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No. 7-1943.

References.—Round stave baskets, *see* 958.12; standard basket sizes, *see* 952.10; fiberboard baskets for fruit and vegetables, *see* 952.14.

952.12 Round-Stave Baskets

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 116. Amendments 1 and 2; 1936. Rules and Regulations of the Secretary of Agriculture Under the U. S. Standard Container Act of 1928. Gives definitions, specifications, tolerances, and variations for hampers, round stave baskets, and splint or market baskets for fruits, vegetables, and for other purposes.

References.—Standard basket sizes, *see* 952.10.

952.13 Coal Baskets

952.14 Fiberboard Baskets

American Hospital Assn., 49-34. Office and Lobby Fiber Waste-Paper Receptacles. Covers two types. Based on U. S. Gov. Federal Specification LLL-R-191.

U. S. Gov., Federal Specification LLL-R-191b; 1943. Receptacles; Waste-Paper, Fiber, Office and Lobby. Covers four types—(I) round office (12 x 10 x 14), (II) round lobby (16 x 14 x 21), (III) oval office (14 x 8 1/2 x 14), and (IV) square office (11 1/2 x 9 1/2 x 15). Gives requirements for material, workmanship, performance, finish, color, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Standard basket sizes, *see* 952.10; container fiberboard, *see* 472.93; standard thicknesses, methods of testing fiberboard, *see* 472.0, 470.3.

952.19 Miscellaneous Baskets

American Hospital Assn., 46-1. Metal Frame Laundry Basket. Covers one type, one grade, and one class.

American Hospital Assn., 49-37. Office and Lobby Metal Waste-Paper Receptacles. Covers two types. Based on U. S. Gov. Federal Specification RR-R-191.

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 116. Amendments 1 and 2; 1936. Rules and Regulations of the Secretary of Agriculture Under the U. S. Standard Container Act of 1928. Gives definitions, specifications, tolerances, and variations for hampers, round stave baskets, and splint or market baskets for fruits, vegetables, and for other purposes.

U. S. Gov., Federal Specification RR-R-191; 1932. Amendment 1; 1936. Receptacles; Waste-Paper, Metal, Office and Lobby. Covers two types of steel waste baskets—round and square. Each type having plain sides or corrugated sided. Gives requirements for material, workmanship, finish, colors, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 64B8B; 1943. Baskets; Bread, Wire.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-283; 1940. Basket; Laundry (Army Duck Body).

952.2 HAMPERS

U. S. Gov., Dept. of Agriculture, War Food Administration, Office of Distribution. Service and Regulatory Announcement No. 116. Amendments 1 and 2; 1936. Rules and Regulations of the Secretary of Agriculture Under the U. S. Standard Container Act of 1928. Gives definitions, specifications, tolerances, and variations for hampers, round stave baskets, and splint or market baskets for fruits, vegetables, and for other purposes.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No. 7. Contains requirements for hampers for shipment of clothing. Published by American Trucking Assns., Inc., Tariff

Bureau. National Motor Freight Classification No. 7-1943.

References.—Standard sizes of vegetable and fruit hampers, *see* 952.10.

953. BOXES

953.1 METAL BOXES

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 61-2. Box; Metal, Fire-Tool Cache No. 1.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 61-5. Box; Metal, Fire-Tool Cache No. 2.

U. S. Gov., Federal Specification RR-B-623; 1941. Amendment 1; 1945. Boxes; Bread, Hinged Type. Covers plain steel grade; and two sizes. Gives requirements for material, workmanship, finish, body, cover, hinge, sizes, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-B-644; 1943. Boxes; Spice. Covers one type and one grade and shall consist of an outer spice box with hinged cover and hasp, enclosing six spice containers of uniform size and shape. Gives requirements for material, workmanship, and details for outer spice box, outer spice box cover, handle, hasp, spice containers, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 42B11a; 1938. Boxes; Spit, Steel (Galvanized), Crews'.

U. S. Gov., Navy Dept. Specification 54 B 4b; 1944. Boxes; Letter.

U. S. Gov., Navy Dept. Specification 55C24a; 1940. Containers; Dress-Equipment (Metal Box).

U. S. Gov., Navy Dept. Specification 57B16; 1941. Boxes; Ointment, Tin.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 49-12; 1940. Box; Metal, Cavalry, Demolition, With Canvas Case and Carrying Strap.

U. S. Gov., U. S. Army, Medical Dept. Specification 1-34A; 1940. Cash Box; Metal With Lock.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2224A; 1941. Box; Pipette.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2521A; 1939. Box; Ointment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2527; 1939. Box, for Gold.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2554; 1939. Box; Soap.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-60; 1939. Box; Spice.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-61; 1939. Match Safe.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 89-4501a; 1940. Box; Selector, M4.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-36; 1937. Box; Ration, Aluminum, Pack Artillery.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-710A; 1943. Box BX-7, for Radio Tubes.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-33a; 1943. Boxes; Bread, Portable, Hinged. Shall be of one grade of hinge type made from a good quality low carbon sheet steel. Gives requirements workmanship, construction, color, finish, sizes, and marking; sampling, inspection, and methods of tests packaging, packing, and marking.

References.—Metal cases, *see* 954.21.

953.2 PAPER AND FIBERBOARD BOXES

American Hospital Assn., 55-4. Pill box. Covers one type, one grade, and three sizes. Based on U. S. Gov., War Dept., Specification 19-52.

American Hospital Assn., 55-7. Powder Box. Covers one type, one grade, and three sizes. Based on U. S. Gov., War Dept., Specification 19-53A.

American Hospital Assn., 55-10. Folding Tablet Box. Covers one type, one grade, and one class. Based on U. S. Gov., War Dept., Specification 19-54.

American Society for Testing Materials, D 641-43; 1943. Method of Conditioning Paper Board, Fiberboard, and Paperboard Containers for Testing. Procedure for conditioning specimens of container grades of paperboard, corrugated board, and solid fiberboard; and containers made from such grades of paperboard, prior to testing. Gives requirements for standard condition, apparatus, procedure, and report.

American Society for Testing Materials, D 642-43; 1943. Method of Compression Testing of Corrugated and Solid Fiber Boxes. Gives requirements for apparatus, test specimens, preparation of specimens, conditioning test specimens, moisture content, procedure, and report.

American Society for Testing Materials, D775-44T; 1944. Technical Assn. of Pulp and Paper Industry Standard Method T802m-44. Tentative Method of Drop Test for Shipping Containers. Gives scope, apparatus, test specimens, identification of container parts, conditioning, height of drop, procedures, and report.

American Society for Testing Materials, D 782-44T; 1944. Technical Assn. of Pulp and Paper Industry Suggested Method T800sm-44. Tentative Method of Drum Test for Containers in Small Revolving Hexagonal Drum Box-Testing Machine. Gives scope, apparatus, test specimen, conditioning, procedures, and report.

Assn. of American Railroads, Freight Container Bureau. Bulletin 36-1940. Packing of Mirrors in Fiberboard Boxes. Describes and illustrates proper methods of packing framed mirrors with standards, unframed, and multiple packing of mirrors, sealing with adhesives or metal staples, and marking.

Assn. of American Railroads, Freight Container Bureau. Bulletin 37-1940. Packing Bedroom Furniture (Case Goods) in Fiberboard Boxes. Describes and illustrates recommended methods for the packing of bedroom furniture (case goods) in double-faced corrugated fiberboard boxes and includes dresser with mirror, vanity and mirror, and chest of drawers.

Assn. of American Railroads, Freight Container Bureau. Bulletins 40, 41, and 42; 1941. Packing Kitchen Enamel Ware in Corrugated Fiberboard Boxes (No. 40), Packing X-Ray Tubes in Wooden and Fiberboard Boxes (No. 41), and Packing of Neon Signs in Fiberboard and Wooden Boxes (No. 42). Describes and illustrates proper methods of packing.

Assn. of American Railroads, Freight Container Bureau. Recommended Methods for Packing Floor and Table Lamps; 1937. Includes floor lamp with glass reflector for indirect lighting, metal table lamp, pottery table lamp bases, large glass globe, and one or more lamp shades.

Assn. of American Railroads, Freight Container Bureau. A Recommended Method for Packing Metal Utility Cabinets in Double-Faced Corrugated Fibreboard Containers. Gives introduction, recommended method of packing metal utility cabinets constructed without legs, recommended method of packing metal utility cabinets constructed with legs, general recommendations, and illustrations.

Assn. of American Railroads, Perishable Div., Freight Container Bureau. Freight Container Bureau Tariff No. 3-A Southeast Territory. Specifications of Standard Containers and Loading Rules for Fresh Fruits, Berries, Vegetables, and Melons, effective June 15, 1940 (issued by J. J. Quinn, agent) and Supplements Nos. 8 (effective May 10, 1941), 9 (effective Sept. 12, 1941), 12 (effective Mar. 2, 1942), 13 (effective Apr. 2, 1942), and 14 (effective June 10, 1942).

Fibre Box Assn. Handbook of Useful Information. Corrugated and Solid Fibre Shipping Containers for Freight, Express, and Parcel Post, 1937. Edition and Supplement 1; 1939. Includes illustrations and descriptions of corrugated and solid fibreboard products; freight and express container specifications; parcel post regulations; trade practice rules; standard specifications for canned food boxes; and box dimensions, canned food, simplified practice recommendation.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Corrugated Shipping Containers. Covers design and selection of materials, materials, types of liners, jointed corners, and printing.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Paper Boxes. Covers specifications, grades, derivation, types of assembly, forms of fabrication, ordering instructions, inspection, uses, and substitutes.

Underwear Institute. Specification G-1; 1935. Standardization of Underwear Box Sizes. Gives outside measurements for boxes for various types of underwear.

U. S. Gov., Army Air Forces. Specification 40773 (1); 1944. Packaging of Aircraft Batteries.

U. S. Gov., Army-Navy Aeronautical Specification AN-B-17; 1944. Boxes; General Specification for, Wood-Cleated Solid Fiberboard, for Export Shipment.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-66; 1945. Packaging of Batteries; Storage, Shielded, Aircraft (Charged and Dry, Uncharged and Moist).

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS33-43; 1943. Knit Underwear (Exclusive of Rayon). Covers standard methods of measuring and standard measurements for knit underwear (exclusive of rayon) for boys, children, infants, men, and women. Includes standard box sizes for men's and boys' union suits, shirts, and drawers, widths and lengths of full standard sizes, included as recommended practice.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R64-30; 1930. One-Pound Folding Boxes for Coffee. This recommendation establishes a simplified list of dimensions and capacities for folding boxes for coffee. Sponsored by the Folding Paper Box Assn. of America and the National Coffee Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R126-41; 1941. Set-Up Paper Boxes (used by department and specialty stores). This recommendation establishes a simplified list of stock sizes of set-up paper boxes used by department and specialty stores. Gives table showing box number, length, width, depth, lid depth, boxboard, number of boxes in package, and construction specification number; and definitions and requirements. Sponsored by National Retail Dry Goods Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R127-41; 1941. Folding Paper Boxes (used by department and specialty stores). This recommendation establishes a simplified list of stock sizes of folding paper boxes for use by department and specialty stores. Gives tables showing box numbers, length, width, depth, caliper of boxboard and weight per 1,000 boxes for lighter type and heavier type boxes, and number of complete boxes to a bundle for one-piece five-panel folders, lock-corner and automatic folding boxes, and millinery boxes—automatic style. Sponsored by National Retail Dry Goods Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R128-41; 1941. Corrugated Fiber Boxes (used by department and specialty stores). This recommendation establishes a simplified list of stock sizes of corrugated fiber boxes for use by department and specialty stores. Gives table showing box number, length, width, and depth of corrugated fiber boxes; table showing liner, weight, kind of material, and caliper for boxboard requirements for freight classification (rule 41) boxes; and table showing liner, weight, kind of material, caliper, and minimum bursting strength of combined board for boxboard requirements for store-test boxes. Sponsored by National Retail Dry Goods Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R146-41; 1941. Corrugated and Solid Fiber Boxes for Canned Fruits and Vegetables. This recommendation establishes a schedule of box sizes for canned fruits and vegetables. Initiated by National Canners Assn. and the Fiber Box Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R172-38; 1938. Stock Folding Boxes for Garments and Dry Cleaning. This recommendation covers standard sizes of boxes and thicknesses of boxboard for garments and dry cleaning. Sponsored by the Folding Paper Box Association of America.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R173-38; 1938. Stock Folding Boxes for Millinery. This recommendation covers standard dimensions of boxes and thicknesses of boxboard for millinery purposes. Sponsored by the Folding Paper Box Assn. of America.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R192-42; 1942. Crayons, Chalks, and Modeling Clays for School Use (Types, Sizes, and Packaging). Includes recommendations for chip-board set-up and folding boxes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R200-43;

1943. Paper Boxes for Toiletries and Cosmetics. The purpose of this recommendation is to reduce the amount of paperboard used for packaging toiletries and cosmetics. It establishes the maximum thickness of paperboard used for these boxes, restricts the size of box in relation to the size of contents, and limits the number of protective covers. Also provides for the simplification of designs.

U. S. Gov., Federal Specification UU-B-651a; 1939. Boxes; Chipboard, Laundry. Covers the one type—lock-corner, full-telescope type. Gives detail requirements; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification UU-B-666; 1943. Amendment 1; 1944. Boxes; Powder, Pharmaceutical. Covers one grade and two types—(I) hinged lid boxes and (II) slide boxes; and three sizes—(1) small, (2) medium, and (3) large. Gives requirements for material, workmanship, construction, hinge, thickness, bursting strength, and sizes; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification LLL-B-631a; 1936. Boxes; Fiber, Corrugated. Covers seven styles of empty boxes without wood frames—(1) slotted container, (2) half-slotted container, (3) design box, (4) telescope design box, (5) telescope box, (6) triple-slide box, and (7) three-piece box. Gives requirements for weight, size, kind of board, thickness, bursting strength, gummed tape, metal fastenings, body joints, covers and details, and illustrations of each type; methods of sampling, inspection, and tests; and packaging, packing, and marking. Emergency Alternate Federal Specification E-LLL-B-631a, July 1943, changed table showing weight, size, thickness, and bursting strength.

U. S. Gov., Federal Specification LLL-B-636a; 1936. Boxes; Fiber, Solid. Covers five types of empty solid fiber boxes without wood frames—(A) slotted container, (B) half-slotted container, (C) design box, (D) telescope design box, and (E) three-piece box. Gives requirements for weight, size, thickness of board, bursting strength, body joints, and covers; methods of sampling, inspection, and tests; and requirements for packaging and marking. Emergency Alternate Federal Specification E-LLL-B-636A, 1942, changed requirements for weight, size, thickness, and bursting strength.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No. 7. Contains requirements for fiberboard trays for shipping brick, fiberboard boxes for shipping wood doors, sash, pyroxylin or other plastic rods, sheets, or tubes, cigarettes, butter, fish, honey, vegetables, steel furniture, glassware, ink, and stall partitions. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No. 7-1943.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2G. Inside Containers—Fiber Cans and Boxes. Includes requirements for thicknesses and strengths. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 12B. Fiberboard Boxes. Includes requirements for materials, tests, construction, closing for shipment, marking, packing, and minimum strengths for fiberboard and parts for boxes having 15. 30, 40, 55, and 65 lb. gross weight when packed. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 12C. Fiberboard Boxes. Similar to I.C.C. Specification 12B, Fiberboard Boxes (referred to herein), except minimum strengths for fiberboard and parts for boxes having 30, 40, and 65 lb. gross weight and double-faced corrugated fiberboard of at least 175-lb. test is authorized for triple slide boxes for 65 lb. gross weight. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 12D. Fiberboard Boxes. Similar to I.C.C. Specification 12B, Fiberboard Boxes (referred to herein), except packing liquids or solids in glass or earthenware, types of boxes, inside packing, size limits, and gross weight. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 12E. Fiberboard Boxes. Similar to I.C.C. Specification 12B, Fiberboard Boxes, except requirements for inside packing, type of box (i.e., one-piece body with separate flanged ends), authorized gross weight of packed box limited to 65 lb. and other exceptions accordingly. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 12L. Hexagonal Fiberboard Containers. Includes requirements for corrugated fiberboard, parts and dimensions, assembly, type tests, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 23F. Solid Fiberboard Boxes. Similar to I.C.C. Specification 12B, Fiberboard Boxes. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Joint Army-Navy Specification JAN-P-103; 1944. Packaging and Packing for Overseas Shipment—Boxes; Wood Cleated, Solid Fiberboard. For boxes whose weight of contents does not exceed 200 lb. and whose maximum inside dimensions are 4 ft. length, 3 ft. width, and 3 ft. depth.

U. S. Gov., Joint Army-Navy Specification, JAN-P-108; 1944. Packaging and Packing for Overseas Shipment—Boxes; Fiberboard, V-Board and W-Board, Exterior and Interior.

U. S. Gov., Joint Army-Navy Specification, JAN-P-133; 1944. Packaging and Packing for Overseas Shipment—Boxes; Set-Up, Paperboard.

U. S. Gov., Marine Corps Specification, 1943. Boxes; Fiber, Corrugated.

U. S. Gov., Marine Corps Specification, 1944. Boxes; Fiber, Solid, Water-Resistant (Outer Box for Export Use).

U. S. Gov., Navy Dept. Specification 53B8a; 1944. Boxes; Shipping, Fiber, Corrugated, Heavy-Weight (for Pay Rolls and Returns Only).

U. S. Gov., Navy Dept. Specification 53B10; 1938. Boxes; Filing, Cardboard.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-52; 1939. Box; Pill.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-53A; 1939. Box; Powder.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-54A; 1941. Box; Tablet, Folding.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 100-13A; 1943. Miscellaneous Lubricant, Container and Packaging.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 22-273; 1941. Canned Goods; Subsistence, for Oversea Shipment, Boxes, Strapping, and Marking, General Specifications for Packing.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 100-11; 1942. Box; Fiber, Special.

References.—Paperboard and paper cartons, *see* 954.1; standard boxboard thicknesses, *see* 472.0; lined boxboard, corrugated boxboard, fiberboard, *see* 472.16, 472.25, 472.93; methods of testing paper and paperboard, *see* 470.3; gummed paper, *see* 479.2.

953.3 WOODEN BOXES

953.30 General Items

Assn. of American Railroads, Freight Container Bureau. Bulletin, 14-1930. Nailed Wooden Boxes. For good construction of seven styles of boxes, comparisons in cost and durability, illustrations of boxes, defects, joints, strapping, design factors, lumber dimensions, moisture requirements, corrugated fasteners, cleated ends, nails and nailing, and methods of packing.

Assn. of American Railroads, Perishable Div., Freight Container Bureau. Freight Container Bureau Tariff No.3-A Southeast Territory. Specifications of Standard Containers and Loading Rules for Fresh Fruits, Berries, Vegetables, and Melons, effective June 15, 1940 (issued by J. J. Quinn, agent) and Supplements Nos.8 (effective May 10, 1941), 9 (effective Sept. 12, 1941), 12 (effective Mar. 2, 1942), 13 (effective Apr. 2, 1942), and 14 (effective June 10, 1942).

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Wire-Bound Boxes. Covers definition, characteristics, ordering instructions, and uses.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, Volume 2; 1944. Boxes; Wooden. Covers classification, characteristics, uses, styles of boxes, and ordering instructions.

Package Research Laboratory. Bulletin 310; 1944. The Design of All-Bound Boxes. Covers how to use tables and chart, definitions of load types, classification of woods, limitations to be observed, tables for designing blanks, chart for designing ends, instructions for positioning wires on ends, minimum dimensions for linered ends made double, style of ends, and ends for loads over 500 lb.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-27B; 1936. Packing; General Specification, Gas Mask.

953.31 Fruit Boxes

References.—Fruit crates, *see* 954.31; grading rules for box lumber, *see* 413.9; box shook and crating, nails, *see* 421.4, 608.1; box construction, nailing, cover construction, *see* 953.30; shipping boxes, *see* 953.39.

953.32 Berry Boxes

U. S. Gov., Dept. of Commerce, National Bureau of Standards H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Berry Baskets or Boxes. Requirements on standard sizes; allowable tolerances on correctness of capacities.

References.—Cranberry boxes, *see* 953.34.

953.33 Vegetable Boxes

References.—Grading rules for box lumber, *see* 413.9; box shook and crating, nails, *see* 421.4, 608.1; box construction, nailing, cover construction, *see* 953.30; shipping boxes, *see* 953.39.

953.34 Cranberry Boxes

References.—*See* references under 953.33.

953.35 Produce (Lug) Boxes

Assn. of American Railroads, Freight Container Bureau. Bulletins 39 and 39A; 1941. Loading and Assembly of Lug Boxes. Include recommended practice for solid load and for divided load.

References.—*See* references under 953.33.

953.36 Special Shipping Boxes

American Bottlers of Carbonated Beverages. Educational Bulletin 4; 1930. Bottle Boxes. For wooden boxes for holding twenty-four 6 1/2 to 9 oz. bottles, requirements on thickness of ends, sides, bottoms, and partitions; dimensions of metal straps.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Nailed Wooden Crates and Boxes. For boxes, classification of woods, requirements on thickness for boxes of sundry sizes of various woods, on width of material, surfacing, joining, nailing, size of nails, dimensions and construction of wooden and fiber boxes, for various weights of lard cans or cartons.

U. S. Gov., Army Air Forces. Specification No.15072; 1945. Plywood Container.

U. S. Gov., Army Air Forces. Specification 40763 (1); 1944. Packaging and Packing of Superchargers for Export Shipment.

U. S. Gov., Army Air Forces. Specification 40824; 1944. Packaging and Packing of Self-Sealing Fuel and Oil Cells in Collapsible Containers.

U. S. Gov., Army Air Forces. Specification 40835-A; 1944. Container; Reusable Collapsible Shipping (Radial Aircraft Engines).

U. S. Gov., Army-Navy Aeronautical Specification AN-C-137; 1944. Container; Reusable Collapsible Shipping (Radial Aircraft Engines).

U. S. Gov., Army-Navy Aeronautical Specification AN-P-30—2; 1944. Packaging and Packing; Aircraft Propeller, for Domestic and Overseas Shipment.

U. S. Gov., Federal Specification EE-S-631a; 1938. Amendment 2; 1941. Spices; Ground and Whole. Includes requirements for shipping cases of nailed or wirebound wood construction.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container—Specification 1A, Boxed Carboys; Specification 1B, Boxed Lead Carboys. Includes requirements for wooden box outside containers and tests for same. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 1X. Boxed Carboys, 5 to 6 Gallons, for Export Only (Glass, Earthenware, Clay, or Stoneware). Single-Trip Container. Includes requirements for closure devices required, manufacture, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission, Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2G. Inside Containers—Fiber Cans and Boxes. Includes requirements for thicknesses and strengths. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 14, 15A, 15B, 15C, and 15D. Wooden Boxes; Nailed. Includes requirements for lumber, nails, construction of parts, dimensions of materials, setting up boxes, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 15X. Wooden Boxes, for Two 5-Gallon Cans. Includes requirements for lumber, construction, sizes, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 16A and 16B. Wooden Boxes; Wire-Bound. Includes requirements for lumber, construction, marking, setting up, and closing. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 19A. Wooden Boxes; Glued Plywood, Pleated. Includes requirements for material, construction, marking, setting up, and closing. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Joint Army-Navy Specification JAN-P-105; 1944. Packaging and Packing for Overseas Shipment—Boxes; Wood, Cleated, Plywood. For boxes whose weight of contents does not exceed 1,000 lb.

U. S. Gov., Joint Army-Navy Specification JAN-P-106; 1944. Packaging and Packing for Overseas Shipment—Boxes; Wood, Nailed. For weight of contents not in excess of 1,000 lb.

U. S. Gov., Joint Army-Navy Specification, JAN-P-107; 1944. Packaging and Packing for Overseas Shipment—Boxes; Wood, Wire-Bound. For boxes whose weight of contents does not exceed 500 lb.

U. S. Gov., Marine Corps Specification, 1941. Cases; Packing, for Subsistence Stores.

U. S. Gov., Navy Dept. Specification 39B12; 1944. Boxes; Shipping, Periscope.

U. S. Gov., Navy Dept. Specification 42C21b; 1941. Cases, shipping; cans, tin, One-Quart, Half-Gallon, One-Gallon.

U. S. Gov., Navy Dept. Specification 42 C 22d; 1943. Cans, Five-Gallon; and Cases, Shipping.

U. S. Gov., U. S. Army, Army Air Forces. Specification 23-31; 1926. Box; Aircraft Engine, for Domestic and Oversea Shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 23-33A; 1936. Box; Aircraft Battery, for Shipment.

U. S. Gov., U. S. Army, Army Air Forces. Specification 23-36A; 1936. Box; Shipping, for Oxygen Supply Tanks.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-71-47; 1938. Chest; Packing, Livens Projector Accessories.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 100-13A; 1943. Miscellaneous Lubricant Container and Packaging.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1652; 1943. Chests and Boxes for Radio Direction-Finder Central TC-8 and Radio-Intercept Central TC-9.

References.—Shipping boxes for canned foods, *see* 953.37; outside containers for boxed carboys, *see* 955.2; grading rules for box lumber, *see* 413.9; box shook and crating, plywood, *see* 421.4, 413.52; box construction, nailing, cover construction, *see* 953.30; nails, *see* 608.1; plywood, *see* 413.52; wooden shipping boxes, *see* 953.39.

953.37 Wooden Boxes for Canned Goods

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R171-38; 1938. Wooden Boxes for Canned Fruits and Vegetables. This recommendation establishes standard inside dimensions of wooden boxes for shipping canned fruits and vegetables. Sponsored by the National Wooden Box Assn.

U. S. Gov., Federal Specification JJJ-O-361; 1930. Amendment 3; 1935. Oil; Vegetable, Salad. Includes specifications for shipping cases. For nailed construction, requirements on thickness of ends and sides. Gives sizes of nails and tensile strength of binding wire or steel straps; strapping.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 22-273; 1941. Canned Goods; Subsistence, for

Overseas Shipment, Boxes, Strapping, and Marking, General Specifications for Packing.

References.—Grading rules for box lumber, *see* 413.9; box shook, nails, *see* 421.4, 608.1; box construction, nailing, cover construction, *see* 953.30; boxes suitable for canned goods, *see* 953.39.

953.39 Miscellaneous Wooden Boxes

Assn. of American Railroads, Freight Container Bureau. Bulletin 24-1931. Supplement, 1931. Preparation of Monuments, Tombstones, and Markers for Shipment. Methods of protection for raised carving and lettering, requirements for size of lumber for crates, boxes, blocking, quality of lumber, nails, steel straps, wrapping paper, and illustrations of various details.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-74; 1938. Dynamite Magazine Storage Box, AAR-1-A. For handling and storing small quantities of explosives in railway maintenance or construction cars; dimensional requirements and construction of high grade pine box with hinged lid, hardware, and covered with 16-gage steel.

Package Research Laboratory. Bulletin 247; 1939. Quality Standards for All-Bound Boxes. Gives requirements for thin boards, cleats, binding wire, rock fasteners, stapling wire, staples, manufacture-general, all-bound ends, assembly, and closure.

U. S. Gov., Federal Specification NN-B-591; 1939. Amendment 1; 1941. Boxes; Wood-Cleated-Fiberboard. Covers eleven styles. Gives requirements for wood, fiberboard, workmanship, edge cleats, nails fastening fiberboard to cleats, fabrication of panels and fabrication of box; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-NN-B-591; 1942, (issued by Procurement Div. Treasury Dept., U. S. Gov.) changed requirements for nailing and gluing of panels.

U. S. Gov., Federal Specification NN-B-601a; 1941. Amendment 1; 1944. Boxes; Wood-Cleated-Plywood (for Domestic Shipments). Covers eleven styles. Gives requirements for wood, cleats, plywood, workmanship, fastenings, fabrication of panels, and fabrication of box; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification NN-B-621a; 1934. Amendment 1; 1935. Boxes; Wood, Nailed, and Lock Corner. Covers two forms of construction, nailed, styles 1, 2, 2 1/2, 3, 4, and 5, and lock-corner, style 6. Gives requirements for material, workmanship, number of pieces on any part, thickness of parts, uncleated ends, surfacing, nailing, cleats, strapping, construction, and allowable weight; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-NN-B-621a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted requirements of Federal Specification LLL-B-631.

U. S. Gov., Federal Specification NN-B-631b; 1944. Boxes; Wood, Wirebound, for Domestic Shipment. Covers four styles. Gives requirements for wood, wire, workmanship, sawed, veneer and plywood boards, cleats, binding wires, staples, battens, end fastenings, additional fastening of battens, liners, and fastening of liners; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No.7. Contains requirements for wooden boxes for shipment of tobacco and alcoholic liquors. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No. 7-1943.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Motor, Rail, and Water. Shipping Container Specification MC201. Container for Blasting Caps, Electric Blasting Caps, and Percussion Caps. Includes general requirements and illustrative line drawings. Published by American Trucking Assns., Inc., Tariff Bureau.

U. S. Gov., Marine Corps Specification, 1940. Chest; Chain Hoist for Pier, Temporary, 10-Ton, Model 1940.

U. S. Gov., Navy Dept. Specification 57B22a; 1944. Boxes; Boat, Empty.

U. S. Gov., Treasury Dept., Procurement Div., No.572; 1942. Boxes; Microscope, Slide. Shall be of one type and grade and the following classes—class A, 25-slide capacity and class B, 100-slide capacity. Gives requirements for bottom, dimensions, rack, top. index, covering, and hinges and catches; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-1C; 1944. Boxes; Chests, and Crates, Engineer Equipment.

U.S. Gov., U. S. Army, Corps of Engineers. Specification 23-14; 1922. Box; Ax.

U. S. Gov., U.S. Army, Corps of Engineers. Specification 23-15; 1922. Box; Tool Grinder, Etc.

U. S. Gov., U.S. Army, Corps of Engineers. Specification 23-16; 1922. Box; 26-Inch, Handsaw.

U. S. Gov., U.S. Army, Corps of Engineers. Specification 23-17; 1922. Box; One-Man 36-Inch Cross-Cut Saw.

U. S. Gov., U.S. Army, Corps of Engineers. Specification 49-14C; 1943. Box; Cap.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2160A; 1941. Box; Micro Slides.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2746A; 1942. Case; Silicate Cement.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 82-14A; 1940. Plywood Packing Box.

U. S. Gov., U.S. Army, Quartermaster Corps. Specification 92-40; 1937. Box; Ration, Pack.

References.—Plywood and Veneer, *see* 413.52; grading rules for box lumber, *see* 413.9; box shook, nails, *see* 421.4, 608.1.

953.9 MISCELLANEOUS BOX SPECIFICATIONS

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 61-1. Box; Concrete, Fire-Tool Cache.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 61-3. Box; Ranch, Fire-Tool Cache No.1.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 61-4. Box; Ranch, Fire-Tool Cache No.2.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 61-6. Box; Frame, Fire-Tool Cache.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 63. Box; Power-Pump Accessory.

U. S. Gov., Navy Dept. Specification 42B9b; 1944. Boxes; Spare-Part, Electrical and Mechanical, for Shipboard Use.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-15-D; 1928. Box; Type BC-102, Battery Carrying.

References.—Battery Boxes, *see* 712.3.

954. CARTONS, CASES, CRATES, AND TUBES

954.1 CARTONS

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Boxes and Crates. Includes fiber containers for thirty 1-lb. lard cartons, both side and end-opening, dimensions, and weight of fiber.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Sausage, Lard, and Sliced Bacon Cartons. Include cartons up to 10-lbs. capacity, giving dimensions, kind, and thickness of stock.

Assn. of American Railroads, Freight Container Bureau. Bulletin 28; 1936. Packing of Chinaware, Earthenware, and Glassware in Corrugated fiberboard Boxes. Bulletin 29; 1936. Packing of Small Articles of Furniture in Corrugated and Solid Fiberboard Boxes. Includes requirements of container, interior packing procedure, illustrations of methods, describes extension wrapper, and packing of small tables, etc.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 94-S. Carton; Gasoline Lantern.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R175-40; 1940. Heavy-Duty, Round, Nesting, Paper, Food, and Beverage Containers and Lids. This recommendation covers standard sizes, shapes, weights, and other dimensions of heavy-duty paper, food, and beverage containers, of the round, nesting type. Sponsored by the Cup and Container Institute.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2C. Inside Containers—Corrugated Fiberboard Cartons. Covers requirements for construction and test. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Joint Army-Navy Specification JAN-P-120; 1944. Packaging and Packing for Overseas Shipment—Cartons; Folding, Paperboard.

References.—Fiberboard boxes, *see* 953.2; standard boxboard thicknesses, *see* 472.0; lined boxboard, corrugated boxboard, fiberboard, *see* 472.16, 472.23, 472.93; methods of testing paper and paperboard, *see* 470.3; gummed paper, *see* 479.2.

954.2 CASES

954.21 Metal Cases

Assn. of American Railroads, Purchases and Stores Div. Card Cases (Boiler Inspection and Washout), 1934. Gives dimensional requirements and illustrations for cases made of IX bright tin or steel of suitable thickness.

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-83; 1936. Metal Boxes for Rubber Gloves. Requirements for water tight carrying cases, in two sizes, stamped from No.24 gage galvanized steel, brass-plated suitcase latches, leather handle, and dimensional drawings.

National Board of Fire Underwriters. Nitrocellulose Motion Picture Film, No.40; 1939. Storage and handling requirements for construction and arrangement of buildings, electrical equipment, heating, sprinklers, allowable weight of film in cabinets and vaults, construction of film cabinets, and film vaults; containers and transportation of film, motion picture projectors, motion picture theaters, film exchanges, laboratories, studios, etc.

Safe Manufacturers' National Assn. Specification for Light Insulated Containers, F5-NT; 1939. For containers with fire-resistive expectancy of from 0 to less than 1/2 hr., and not recommended as protection for valuable records.

U. S. Gov., Army Air Forces. Specification 40836-A; 1945. Container; Steel Shipping.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 32A, 32B, 32C, and 32D. Metal Cases and Trunk. Includes requirements for gauge standards, covers, edge protection, bottom protection, hinges, carrying handles, closing devices, rivets, rivet reinforcement, lining, metal partitions, protective coating, tests, and markings—32A, metal cases, riveted or lock-seamed; 32B, metal cases, welded or riveted; 32C, trunks; and 32D, metal boxes for old and worn-out motion-picture film no longer exhibitable. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-55; 1943. Case; Map Filing, Steel, Fireproof, Olive Green Finish, Vertical.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-149; 1922. Case; Type CS-21, for Carrying Vacuum Tubes.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-3030-A; 1944. Case; CS-137.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-13B; 1931. Case; Type CS-22, Metal, for Motion-Picture Film.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-46; 1938. Shipping Case; Motion-Picture Film.

References.—Iron and steel sheets, *see* 604.2; standard box board thicknesses, *see* 472.0; lined box board, fiberboard, *see* 472.16, 472.93.

954.22 Paper and Fiber Cases

U. S. Gov., Navy Dept. Specification 54C1a; 1941. Cases; Filing, Transfer.

U. S. Gov., Treasury Dept., Procurement Div., No. 625; 1943. Cases; Filing, Transfer (Cardboard, Collapsible). Covers one grade and one type and in sizes specified. Gives requirements for material, workmanship, cardboard, and construction; letter size height, depth and width; cap size height, depth, and width; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 632; 1943. Cases; Index Card and Storage or Transfer (Wood or Fiber). Covers type I, Index Card Cases—class A, with hinged covers, and class B, with hinged cover and hinged drop front; and type II, Storage or Transfer Cases—class A, with detachable cover and follower. Gives requirements for material, tolerances, construction, sizes, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U.S. Gov., U.S. Army, Chemical Warfare Service. Specification 19-1; 1926. Case; Carrying, Gas-Mask Repair Kit, Mk. 11.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-62; 1939. Case; Mailing, Dental, Large and Small.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-133; 1941. Case; Type PH-236, for Camera Equipment, Type PH-205.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-134; 1941. Case, PH-237, for Cut-Film Holders, PH-82.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-135; 1941. Case, PH-238, for Cut-Film Holders, PH-84.

U. S. Gov., U. S. Army, Signal Corps. Specification 75-193; 1942. Case; PH-83-B, Camera.

References.—Envelopes and file folders, *see* 494.

954.23 Wooden Cases

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-85; 1944. Dynamite Carrying Case; AAR-1-A. For use in the communication plant. Gives general requirements, material and workmanship, dimensions, identification, inspection and tests, packing, marking, and warranty.

U.S. Gov., Army Air Forces. Specification 40340-B (1); 1944. Case; Shipping (Air Force Organization Equipment).

U.S. Gov., Army Air Forces. Specification 40397-C (2); 1944. Case; Squadron, Type J-1A (Engineering Technical Supply).

U. S. Gov., Army Air Forces. Specification 40398-B; 1943. Case; Technical Order File.

U. S. Gov., Army Air Forces. Specification 40445-A; 1943. Case; Squadron, Type H-1 (for Armament Spare Parts).

U. S. Gov., Army Air Forces. Specification 40446B-1; 1945. Case; Squadron, Type H-2, for Communications Spare Parts.

U. S. Gov., Army Air Forces. Specification 40716; 1944. Case; Intelligence Officer's Field Kit, Type M-1.

U. S. Gov., Treasury Dept., Procurement Div., No. 632; 1943. Cases; Index Card and Storage or Transfer (Wood or Fiber). Covers type I, Index Card Cases—class A, with hinged covers, and class B, with hinged cover and hinged drop front; and type II, Storage or Transfer Cases—class A, with detachable cover and follower. Gives requirements for material, tolerances, construction, sizes, and details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-288; 1943. Container; Storage, Type A-6, Camera Magazine.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-372; 1944. Kit; Photographic Processing and Developing, Type N-1.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-997; 1941. Case; Type CS-72.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-998; 1941. Case; Type CS-71.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-999; 1941. Case; Type CS-73.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1021; 1941. Case; Type CS-58, for Switchboard, Type BD-80.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1022; 1941. Case, Type CS-59, for Frame, Type FM-19.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1023; 1941. Case, Type CS-60, for Panel, BD-90.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1024; 1941. Case; Type CS-61, for Cable Racks.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1025; 1941. Case, Type CS-64, for Chair, Type M-192.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1026; 1941. Case, CS-66, for Cabinet, BE-72.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1027; 1941. Case, CS-69, for 12 Cords, CD-334.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1044; 1941. Case; Type CS-74.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1608A; 1943. Case, CS-124; and Case, CS-126.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1635; 1943. Case; PH-410-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 75-100; 1942. Case; CS-77-( ), Film Viewer.

954.29 Miscellaneous Cases

U. S. Gov., Navy Dept. Specification 18C4b; 1944. Cases; Captain's, Compasses, Dividers, and Reading-Glasses.

U. S. Gov., Navy Dept. Specification 18C9d; 1944. Cases; Navigator's, Compasses, and Dividers.

U. S. Gov., Navy Dept. Specification 57C8a; 1944. Cases; Forceps, Hemostatic.

U. S. Gov., Navy Dept. Specification 57C9; 1941. Cases; Pocket, Surgical-Instrument.

U. S. Gov., U.S. Army, Chemical Warfare Service. Specification 96-61-15; 1941. Container; Packing, Detonation, Gas-Identification Set M1.

U. S. Gov., U. S. Army, Medical Dept. Specification 23-84; 1925. Case; Export, for Two 5-Gallon Alcohol Tins.

U. S. Gov., U. S. Army, Signal Corps. Specification 23-77; 1924. Case; Type CS-8, Carrying, for Dry Batteries.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-993; 1941. Case; Type CS-57.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-994; 1941. Case; Type CS-63.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1041; 1941. Case; Type CS-78, for Telegraph-Printer Tools.

954.3 CRATES

954.30 General Items

Assn. of American Railroads, Freight Container Bureau Bulletin 6-1927. The A.B.C. of Good Crating. Gives general information on crating articles for shipment, requirements for lumber seasoning, illustrates allowable defects in lumber and nailing, nail sizes and holding power, construction of three-way corners, sheathing, bracing, packing, and plywood crates.

Assn. of American Railroads, Perishable Div., Freight Container Bureau. Freight Container Bureau Tariff No.3-A Southeast Territory. Specifications of Standard Containers and Loading Rules for Fresh Fruits, Berries, Vegetables, and Melons, effective June 15, 1940 (issued by J. J. Quinn, agent) and Supplements Nos.8 (effective May 10, 1941), 9 (effective Sept. 12, 1941), 12 (effective Mar. 2, 1942), 13 (effective Apr. 2, 1942), and 14 (effective June 10, 1942).

954.31 Fruit Crates

References.—Basket crates, *see* 954.35; crate construction and crating, cover construction, *see* 954.30; grading rules for box lumber, *see* 413.9; box shook and crating, nails, *see* 421.4, 608.1; drying trays for raisins and fruits, *see* 959.9.

954.32 Berry Crates

References.—Basket crates, *see* 954.35; crate construction and crating, cover construction, *see* 954.30; grading rules for box lumber, *see* 413.9; box shook and crating, nails, *see* 421.4, 608.1.

954.33 Vegetable Crates

U. S. Gov., Federal Specification HHH-P-611. Amendment 2; 1942. Potatoes; Irish. Covers the Crates used for packing and shipping potatoes. Gives dimensions, materials, and strength of materials.

References.—Basket crates, *see* 954.35; crate construction and crating, cover construction, *see* 954.30; grading rules for box lumber, *see* 413.9; box shook and crating, nails, *see* 421.4, 608.1.

954.35 Basket Crates

References.—Fruit and vegetable baskets, *see* 952.11; crate construction and crating, cover construction, *see* 954.30; grading rules for box lumber, *see* 413.9; box shook and crating, *see* 421.4; nails, *see* 608.1; drying trays for raisins and fruits, *see* 959.9.

954.36 Shipping Crates

American Iron and Steel Institute. Steel Products Manual, Section 9a; 1943. Standard Packaging and Shipping Methods of Cold-Finished Bars. General Provisions, packaging, boxing, paper or burlap wrapping, wrapping or shrouding, and identification.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Nailed Wooden Crates and Boxes. For crates, dimensions of crate and of cleats, thickness of sides, ends, etc., number of pieces, size and number of binding wire for wire bound crates, including weight capacities of nailed and wire bound lard can crates, and of pork and smoked meat crates.

Assn. of American Railroads, Freight Container Bureau. A New Method of Cushioning Gas and Electric Ranges. Utilizing Rubber Bushing Washers, 1940. Illustrates and describes special rubber washer devices and methods of installation.

Assn. of American Railroads, Freight Container Bureau. A Recommended Method of Packing and Crating Metal Sink Cabinets. Illustrates and describes construction of base section and method of bolting sink cabinet to same, method of bolting cabinets in crates, standard nailed wooden crate, wire-bound type crates, hinge corner type crate, and the panel box.

Assn. of American Railroads, Freight Container Bureau. Packing Machinery for Export, 1939. Covers fundamentals of general construction of crates, securing of machine to skid unit, preparation of machinery for crating, skid sizes based on weight, number of skins required, side and end units of case, blocking, bracing, securing of small parts, ventilation holes, decking of nonboxed units, hold-down blocking, nailed-on banding, sling marks, stenciling, etc.

Assn. of American Railroads, Freight Container Bureau. Bulletin 5; 1926. Crates for Parlor Heaters. Bulletin 7; 1926. Crating Oak Heaters. Bulletin 8; 1926. Crates for Cast-Iron Warm-Air Furnaces. Recommendations for the proper method of packing, bracing, nailing, and construction of crates, with illustrations, for the heaters covered.

Assn. of American Railroads, Freight Container Bureau. Bulletins 9 and 10; 1927. The Three-Way Corner Crate. Construction and opening methods illustrated for maximum strength in shipping crates.

Assn. of American Railroads, Freight Container Bureau. Bulletins 11, 12, 13, 16, 17, 18, and 20-1929. Crating of Furniture (Case Goods). Includes crates of plywood, for packing of upholstered furniture, reed and fiber, bed ends, etc., quality and weight requirements of wrapping paper, moisture content, defects, and types of wood for crating lumber, minimum dimensions of parts, nails and nailing, and packing in crates.

Assn. of American Railroads, Freight Container Bureau. Bulletin 15-1928. Packing and Crating of Mirrors. Gives requirements for packing either separately or with other furniture, illustrations of wrapping and crating, size of lumber, sheathing, quality of lumber, nails, and loading of mirrors.

Assn. of American Railroads, Freight Container Bureau. Bulletin 19; 1929. Crating and Packing Commercial Store Fixtures. Bulletin 21; 1930. Commercial Refrigerators. Bulletin 23; 1930. Soda Fountains. Gives descriptions and illustrations of proper methods of wrapping and crating, requirements for quality and size of lumber, nails and nailing, bracing, sheathing, and recommendations for protection of marble tops.

Assn. of American Railroads, Freight Container Bureau. Bulletin 22-1930. Crates for Tables. Recommendations for proper method of crating, bracing, nailing and construction of crates, with illustrations, for dining room and library tables and table tops.

Assn. of American Railroads, Freight Container Bureau. Bulletin 26-1935. Crates for Enameled Iron Sanitary Ware. Bulletin 27-1936. Handling Damages and Manufacturers' Defects in Enameled Iron Sanitary Ware. Recommendations for packing bath tubs, flat rim and apron sinks, laundry trays, etc., methods and illustrations for distinguishing defects and shipping damage, construction of crates, lumber, nailing, and strapping.

Assn. of American Railroads, Freight Container Bureau. Bulletin 30-1936. Crating and Packing Steel Office Furniture. Recommendations for the proper method of packing, bracing, nailing, and construction of crates, with illustrations, for vertical filing case, transfer case, knocked-down table, safe, flat-top desk, typewriter desk, knocked-down lockers, and storage cabinet. Also general information on crating.

Assn. of American Railroads, Freight Container Bureau. Bulletins 40, 41, and 42; 1941. Packing Kitchen Enamel Ware in Corrugated Fiberboard Boxes (No.40); Packing X-Ray Tubes in Wooden and Fiberboard Boxes

(No. 41); and Packing of Neon Signs in Fiberboard and Wooden Boxes (No. 42). Describes and illustrates proper methods of packing.

Assn. of American Railroads, Freight Container Bureau. Circular 20; 1938. Crates for Cook Stoves. Gives requirements for paper and strawboard used in wrapping and packing of parts, woods for crates grouped according to strength and nail holding power, permissible moisture and defects in lumber, dimensions of crate parts, nails and nailing requirements, construction of three-way corner, bracing, cushioning with rubber bushing washers, and methods of packing.

National Furniture Warehousemen's Assn. Household Goods, Packing and Shipping Specifications, undated. Recommendations on padding, wrapping, packing, and crating; itemized lists of kinds and amounts of materials needed for packing and crating each of many kinds of furniture and household articles.

U. S. Gov., Army Air Forces. Specification 40887-1; 1945. Preservation and Packaging of Aircraft Turrets.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-118; 1944. Crate, Shipping and Packing; Aircraft and Aircraft Air-Frame Component Parts, General Specification for.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No. 7. Contains requirements for crates for shipment of glazed doors, sash, furniture, glass, lamp globes, shades or reflectors, crucibles, and mercury vapor lamps. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No. 7-1943.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-35; 1942. Container; PG-51, Pigeon, 4-Bird, Transportation.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-37; 1942. Crate; PG-49, Pigeon, 30-Bird, Transportation.

References.—Crate construction and crating, *see* 954.30; box shook and crating, *see* 421.4; nails, *see* 608.1; lined boxboard, corrugated boxboard, fibreboard, *see* 472.16, 472.23, 472.93; wrapping paper, *see* 477.

954.39 Miscellaneous Crate Specifications

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-1C; 1944. Boxes, Chests, and Crates; Engineer Equipment.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2488; 1939. Crate for Lanterns.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-36; 1941. Cage; PG-50, Pigeon, 15-Bird, Training.

954.4 TUBES AS CONTAINERS

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 29. Mailing Tubes. Includes requirements for cushioning, construction, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-7A; 1943. Tubes; Paper Storage.

U. S. Gov., U. S. Army, Medical Dept. Specification 19-7C; 1939. Case; Mailing

955. BOTTLES, CARBOYS, FLASKS, JARS, AND DEMIJOHNS

955.0 GENERAL ITEMS

American Society for Testing Materials, C 147-43; 1943. Method of Hydrostatic Pressure Test on Glass Containers. For determination of breaking strength of narrow-mouth glass containers and serviceability of pressure containers. Covers apparatus, sampling, procedure, and report.

American Society for Testing Materials, C 148-43; 1943. Method of Polariscopic Examination of Glass Containers. For determining the relative annealing stress in glass containers by comparison with reference standards. Covers apparatus, sampling, procedure, and report.

American Society fot Testing Materials, C 149-43; 1943. Method of Thermal Shock Test on Glass Containers. For determining relative resistance of commercial glass containers (bottles and jars) to temperature changes (thermal shock) in service such as washing, pasteurization, or "hot-pack" processes, etc. Gives requirements for apparatus, sampling, procedure, and report.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 2; 1935. Capacity, Weight, and Body Tolerances Glass Containers Not Including Milks, Pressure Bottles, or Pressed Ware.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 42; 1941. Finish Requirements for Half and Gallon Containers With Handles.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing CF-640; 1938. Cork Finish for Narrow Mouth French Square Bottle.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 1100; 1939. Beacon Finish.

Glass Container Assn. of America. Lug Amerseal Angle Straight Finishes. Standard Glass Finish Blue Prints. Drawing 1204; 1939. Two Lug Amerseal A-S Finish. Drawing 1404; 1939. Four Lug Amerseal A-S Finish. Drawing 1604; 1939. Six Lug Amerseal A-S Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 1205; 1939. Templates for Cam-Off or Optional Stop.

Glass Container Assn. of America. Combination Screw Cap and Friction Cap Condiment Finishes. Standard Glass Finish Blue Prints. Drawing 2008; 1940. Combination Goldy Crown and Screw Cap Condiment Finish. Drawing 2258; 1940. Combination Goldy Crown and Screw Cap Condiment Finish. Drawing 2352; 1940. Short Combination Goldy Crown and Screw Cap Condiment Finish. Drawing 2506; 1940. Combination Goldy Crown and Friction Cap Condiment Finish. Drawing 2756; 1940. Combination Goldy Crown and Friction Cap Condiment Finish. Drawing 2852; 1940. Short Combination Goldy Crown and Friction Cap Condiment Finish.

Glass Container Assn. of America. All Glass Sprinkler Tops. Standard Glass Finish Blue Prints. Drawing 3006; 1939. All Glass Sprinkler Top. Drawing 3102; 1939. All Glass Sprinkler Top, Drain Back or Concave Style With Sealing Ring. Drawing 3202; 1939. All Glass Sprinkler Top, Nib Opening. Drawing 3300; 1937. All Glass Sprinkler Top, Drain Back or Concave Style.

Glass Container Assn. of America. Thread Finishes. Standard Glass Finish Blue Prints. Drawing 4042; 1941. Shallow Continuous Thread Finish (Sizes 18-120). Drawing 4031; 1933. Diameter Gauges—Shallow Continuous Thread Finish (Sizes 35-120). Drawing

4033; 1936. Diameter Gauges—Shallow Continuous Thread Finish (Sizes 18-33). Drawing 4102; 1935. Medium Continous Thread, Concealed Ball Finish. Drawing 4154; 1943. Tall Continuous Thread, Concealed Ball Glass Finish. Drawing 4258; 1943. Shallow Continuous Thread Finish (Sizes 8-15). Drawing 4255; 1933. Diameter Gauges—Shallow Continuous Thread Finish. Drawing 4300; 1939. Combination Continuous Thread and Pour Out Finish. Drawing 4400; 1942. Pressed Ware Shallow—Continuous Thread Finish. Drawing 4518; 1941. Deep Continuous Thread Finish. Drawing 4513; 1931. Diameter Gauges—Deep Continuous Thread Finish.

Glass Container Assn. of America. Crown Finishes. Standard Glass Finish Blue Prints. Drawing 6008; 1941. Crown Finish, for Carbonated Beverage and Export Beer Bottle. Drawing 6100; 1941. Crown Finish, for Steinie Beer Bottle. Drawing 6200; 1941. Crown Finish, for Stubby Beer Bottle. Drawing 6500; 1944. Crown Glass Finish, for Single Trip Beer Bottles. Drawing 7008; 1944. Large Size Crown Glass Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 8000; 1941. Anchor Hocking—N Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Prints. Drawing 9000; 1943. Repeal Bead for 28 G.C.A. 400 Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 9100; 1943. Bail Eyelet Glass Finish.

Glass Container Assn. of America. Kork-N-Seal Finishes. Standard Glass Finish Blue Prints. Drawing 11010; 1941. Kork-N-Seal Standard Finish. Drawing 11102; 1941. English Kork-N-Seal Finish. Drawing 11256; 1941. Kork-N-Seal Tamper-Proof Finish. Drawing 11502; 1941. Kork-N-Seal Pouring Lip Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 12004; 1944. Flip Seal Glass Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Prints. Drawing 13008; 1936. Three and Four Lobe Duplex Glass Finish. Drawing 13003-A; 1930. Duplex Glass Finish Neck Gauge. Drawing 13003-B; 1930. Duplex Glass Finish Cam Depth Gauge. Drawing 13003-C; 1930. Duplex Glass Finish Over-All Cam Gauge.

Glass Container Assn. of America. Uniplex Seal Finish and Gauges. Standard Glass Finish Blue Prints. Drawing 13102; 1940. Uniplex Seal Finish. Drawing 13101; 1940. Uniplex Finish Gauges—Neck, Cam Depth, and Over-All Cam Gauges.

Glass Container Assn. of America. Cap Band Finishes. Standard Glass Finish Blue Prints. Drawing 14006; 1937. Band Cap Finish. Drawing 14003; 1931. Diameter and Profile Gauges—Band Cap Finish. Drawing 14252; 1937. Band Cap Finish. Drawing 14251; 1937. Band Cap Finish—Diameter and Profile Gauges.

Glass Container Assn. of America. Anchor or Friction Finishes and Anchor Bead Finishes. Standard Glass Finish Blue Prints. Drawing 15004; 1931. Anchor or Friction Finish, for Pressed Tumblers only. Drawing 15005; 1935. Diameter Gauges—Anchor Friction Finish. Drawing 15250; 1931. Anchor or Friction Finish—for Jars Only. Drawing 15508; 1937. Anchor Bead Finish. Drawing 15505; 1935. Diameter Gauges—Anchor Bead Finish.

Glass Container Assn. of America. Roll on Finishes. Standard Glass Finish Blue Prints. Drawing 16008; 1941. Roll On Glass Finish. Drawing 16001; 1929. Diameter Gauges—R.O. Finish (Sizes 18-83). Drawing 16210; 1941. Pilfer-Proof R.O. Glass Finish. Drawing 16306; 1941. Tamper-Proof and Alter-Proof R.O. Glass Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 16406; 1941. Roverseal Glass Finish.

Glass Container Assn. of America. Friction Pry-Off Finishes. Standard Glass Finish Blue Prints. Drawing 17101; 1944. Diameter Gauges for Friction Pry-Off Glass Finish. Drawing 17106; 1943. Friction Pry-Off Finish. Drawing 17204; 1944. Deep Friction Pry-Off Finish.

Glass Container Assn. of America. Goldy Finishes. Standard Glass Finish Blue Prints. Drawing 18004; 1931. Goldy Glass Finish Style "HS". Drawing 18003; 1934. Goldy Glass Finish—Diameter Gauges. Drawing 18400; 1937. Goldy Finish—Style "G". Drawing 18504; 1934. Goldy Glass Finish—Style "H". Drawing 18650; 1937. Goldy Reclosure Finish. Drawing 18754; 1937. Goldy Finish (Size 18).

Glass Container Assn. of America. Corseal Finishes. Standard Glass Finish Blue Prints. Drawing 18102; 1937. Long Corseal Finish. Drawing 18202; 1937. Short Corseal Finish.

Glass Container Assn. of America. Hazelug Straight Finish. Standard Glass Finish Blue Prints. Drawing 19200; 1941. Two Lug Hazelug Straight Finish. Drawing 19300; 1941. Three Lug Hazelug Straight Finish. Drawing 19400; 1941. Four Lug Hazelug Straight Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 20000; 1944. Glass Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 21002; 1936. Small Size Crown Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 23002; 1938. Upressit Finish.

Glass Container Assn. of America. Combination Crown and Goldy Finishes. Standard Glass Finish Blue Prints. Drawing 24004; 1941. Combination Crown or Goldy Finish, for Long Neck Bottles. Drawing 24100; 1941. Combination Crown or Goldy Finish, for Short Neck Bottles.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 25000; 1931. Straight Ledge Crown Pry-Off Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 26000; 1933. Pry-Off Finish, for Anchor "F" Cap.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 27000; 1935. Spun on Glass Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 28000; 1934. Combination Cup Cap Glass Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 29002; 1937. Jigger Seal Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 30000; 1943. AH-L Glass Finish.

Glass Container Assn. of America. Cork Finishes. Standard Glass Finish Blue Prints. Drawing 31004; 1943. Brandy Cork Glass Finish. Drawing 31050; 1943. Short Brandy Cork Glass Finish. Drawing 31104; 1944. Sauterne or Cognac Glass Finish. Drawing 31202; 1943. Square Ring Cork Glass Finish. Drawing 31302; 1943. Gin Glass Finish. Drawing 31350; 1943. Taper Ring Cork Glass Finish. Drawing 31404; 1943. Champagne Glass Finish. Drawing 31504; 1943. Vermouth Glass Finish. Drawing 31602; 1943. Sweet Wine Glass Finish. Drawing 31704; 1943. Medium Brandy Cork Glass Finish. Drawing 31902; 1943. Standard Wine Glass Finish.

Glass Container Assn. of America. Constricted Cork Finishes. Standard Glass Finish Blue Prints. Drawing 32004; 1943. Constricted Cork Glass Finish. Drawing 32102; 1943. Constricted Cork Glass Finish.

Glass Container Assn. of America. Guardian Safety Seal Finish. Standard Glass Finish Blue Prints. Drawing 33204; 1936. Guardian Safety Seal Finish. Drawing 33800; 1939. Double Spin Guardian Safety Seal Finish. Drawing 33900; 1939. Double Spin Guardian Safety Seal Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 34000; 1935. Combination Tamper-Proof Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 35000; 1936. Siphon Bottle Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 36000; 1943. Super-Seal Glass Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 37504; 1941. Bead Finish for Jars Without Shoulders.

Glass Container Assn. of America. Standard Glass Finish Blue Prints. Drawing 38000; 1937. Combination Crown or Goldy Oil Bottle Finish. Drawing 38100; 1937. Combination Goldy Tamper-Proof Ledge Oil Bottle Finish. Drawing 38200; 1937. Combination Goldy and Screw Top Oil Bottle Finish.

Glass Container Assn. of America. Standard Glass Finish Blue Print. Drawing 39002; 1940. Vacuum Pry-Off Finish.

Glass Container Assn. of America. Standard Glass Blue Print. Drawing 50000; 1938. Can Thread Style Finish.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes recommendations for types of bottles for use in spotting department.

955.1 BOTTLES

American Bottlers of Carbonated Beverages. Educational Bulletin 4; 1930. Bottle Simplification. Recommended practice on sizes of bottles as a result of a conference under auspices of Div. of Simplified Practice of National Bureau of Standards, Standard Capacities, main dimensions, and weight of glass for soda and imported ginger ale shapes, water and water shape ginger ales, beers, export, select or C. S. shape.

American Bottlers of Carbonated Beverages. Educational Bulletin 4; 1930. Crown Finish for Beverages Bottles. Standard dimensions and shape of bottle top, identical with No. 600 glass finish of the Glass Container Assn.

American Hospital Assn., 16-4. Prescription Bottles. Covers one grade; rectangular or oval with narrow mouth and cork stopper closure; rectangular or oval with narrow mouth and screw cap closure; french square with narrow mouth and screw cap closure; and in capacities in fluid ounces of 1/2, 1, 2, 4, 8, 16, and 32. Based on U. S. Federal Specification DD-B-591a.

American Hospital Assn., 64-1. Vacuum and Insulated Bottles and Jugs. Covers three types. Based on U. S. Gov. Federal Specifications RR-B-596.

Glass Container Assn. of America. Standard Glass Container Blue Prints. Drawing C-128-A; 1941. Steinie Shape Beer Bottle. Drawing C-130-A; 1941. Ale Shape Bottle. Drawing C-146-A; 1941. Export Shape Beer Bottle. Drawing C-150-A; 1941. Select Shape Beer Bottle. Drawing C-190-A; 1941. Champagne Shape Beer Bottle. Drawing C-184; 1939. Single Trip Beer Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Prints. Drawing C-202; 1938. Vinty Wine Bottle. Drawing C-240; 1940. Round Wine Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-260; 1939. Round Brandy Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Prints. Drawing C-302; 1938. Round Stubby Catsup Bottle. Drawing C-310; 1938. Medium Height Catsup Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-324; 1938. Round Tomato Juice, Fruit Juices, Syrup, and Vinegar Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-344; 1938. Squat Round Vinegar Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-362; 1939. Round Stubby Juice Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-408; 1939. Oval Stubby Ammonia Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-424; 1938. Round Stubby Hypochloride Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-440; 1938. Stubby Rubbing Alcohol Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-604; 1939. Castor Oil Oval.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-624; 1939. Boston Round Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-642; 1939. Narrow Mouth French Square Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-660; 1939. Round Hydrogen Peroxide Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Prints. Drawing C-680; 1939. N/M Jug Handled Gallon. Drawing C-690; 1939. N/M Round Gallon Bottle.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-740; 1939. Tapered Oblong Extract Bottle.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H 29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Lubricating-Oil Bottles. Includes all bottles used for the sale of lubricating oils for immediate delivery to the crankcase of a motor vehicle, whether or not the bottle is used to determine the quantity of oil sold and whether or not it is sealed with a cap or some other device. Detail requirements are given relative to the construction of bottles, as well as allowable tolerances.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H 29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Milk Bottles. Shall be construed to include all glass bottles used for the purpose of the measurement and delivery of milk, cream, and buttermilk, at retail, and also other containers which are employed for this purpose. Specification requirements are given for the construction of milk bottles and allowable tolerances.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R10-27; 1927. Milk and Cream Bottles and Bottle Caps. This recommendation establishes a schedule of standard sizes, capacities, and dimensions of milk and cream bottles, and sizes of caps for these bottles. Sponsored by the Glass Container Assn. of America.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R123-43; 1943. Carbonated Beverage Bottles. This recommendation establishes a list of capacities, heights, diameters, and weights of glass as standards for stock (nonreturnable or plain type) carbonated beverage bottles. Covers water shape, steinie shape, and soda shape of round beverage bottles.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R131-35; 1935. Glass Containers for Mayonnaise and Kindred Products. This recommendation establishes a list of stock sizes of glass containers for mayonnaise and kindred products.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R148-33; 1933. Glass Containers for Cottage Cheese and Sour Cream. This recommendation establishes a schedule of sizes and dimensions of glass containers for cottage cheese and sour cream. Initiated by the International Assn. of Milk Dealers, Milk Cap Statistical Bureau, and Glass Container Assn. of America.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R196-42; 1942. Glass Containers for Green Olives (Capacities, Dimensions, and Packaging). Establishes 12 bottle sizes in lieu of at least 90 different varieties of bottles that have been used. Gives requirements for trade designation, style, capacity, maximum weight of glass, dimensions, finish size, and number of packages to shipping case.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R197; 1942. Glass Containers for Maraschino Cherries (Capacities, Dimensions, and Packaging). Covers reduction in variety and sizes for the benefit of packers, bottle manufacturers, distributors, and consumers. Gives requirements for package sizes, capacity, weight of glass, height and dimensions, finish, and number of ~~packages~~ to shipping case for vase-shaped bottle sizes for retail and large utility or institutional sizes.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 203-44; 1944. Containers and Packages for Household Insecticides (Liquid Spray Type). Gives various dimensions for retail packages (Boston round bottle and glass jug) for pint, quart, gallon bottle, and gallon jug; and covers industrial packages (5-gal. and 54-gal. steel drums). Sponsored by National Assn. of Insecticide and Disinfectant Mfrs., Inc.

U. S. Gov., Federal Specification DD-B-576; 1942. Bottles; Dropping. Covers two types—(I) with ground-in, grooved-glass stoppers; and (II) with ground-in glass pipette dropper with rubber bulb; one grade, two classes—amber and clear glass; and two sizes—30 cc. and 60 cc. Gives requirements for material, workmanship, annealing, composition, construction, and dimensions; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification DD-B-591a; 1941. Bottles; Prescription. Covers two types—(I) cork stopper closure, in one class—(A) rectangular or oval, with narrow mouth; and (II) screw cap closure, in two classes—(A) rectangular or oval, with narrow mouth and (B) French square, with narrow mouth; in the following sizes—1/2, 1, 2, 4, 8, 16, and 32 fluid ounces. Gives requirements for material, workmanship, finish, graduations, shape, and variations; methods of sampling and inspection; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-B-596; 1938. Bottles and Jugs; Vacuum and Insulated. Covers three types—(I) cylinder, screw-top; (II) pitcher or carafe; and (III) jug; and two classes—(A) glass—inner container (vacuum) and (B) metal—inner container (insulated). Gives requirements for outer and inner containers and caps; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Marine Corps Specification, 1923. Bottle; Water, 5-Gallon.

U. S. Gov., Navy Dept. Specification 57B15; 1941. Bottles; Shelf, Pharmaceutical.

U. S. Gov., Navy Dept. Specification 57L8; 1941. Labels; Glass, Shelf-Bottle.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-24; 1929. Bottle; Glass, 4-Ounce.

U. S. Gov., U. S. Maritime Commission. Specification 63-MC-9; 1943. Bottles; Glass, Water. Covers one grade of blown glass water bottles in two types—(I) stateroom and (II) saloon. Gives general requirements, material, workmanship, design, dimensions, and capacity; sampling, inspection, and methods of test; and packaging, packing, and marking.

References.—Bottle top finishes, *see* 955.0; vinegar bottle for table use, *see* 523.1; sealing wax for bottles, *see* 719.59; bottles for medicine, *see* 915.37.

955.2 CARBOYS

Manufacturing Chemists' Assn. of the U. S. Manual Sheet C-1 (for Shippers). Carboys, Glass-Boxed (I.C.C.-1A)—

Service Requirements. Recommended Practice; adopted 1935, revised 1942. Includes recommendations for plant conditions, storage, handling, inspection, maintenance, testing, washing, filling, closing devices, and loading and bracing boxed carboys filled with inflammable and corrosive liquids; correct method for loading a carload of empty boxed carboys in box car; shipping; and refers to U. S. Dept. of Agriculture, Food, Drug, and Insecticide Administration, "Service and Regulatory Announcements—Caustic Poison No. 2," Sheet S.R.A., C.P. No. 2, Apr. 9, 1928, for Internal and External Antidotes.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet C-2 (for Consignees). Carboys, Glass-Boxed (I.C.C.-1A)—Handling and Storing, When Filled With, or Last Containing Any Product Authorized for Shipment Therein. Recommended Practice, adopted 1935. Includes recommendations for handling, special trucks to handle carboys, storage of filled boxed carboys, opening, emptying, handling, storage, and loading empty boxed carboys, special precautions, and refers to U. S. Dept. of Agriculture, Food, Drug, and Insecticide Administration "Service and Regulatory Announcements—Caustic Poison No. 2," Sheet S.R.A., C.P. No. 2, Apr. 9, 1928, for Internal and External Antidotes.

Manufacturing Chemists' Assn. of the U. S. Manual Sheet C-3. Carboy Bottle, Glass (13-Gallon, Cylindrical, Straight Side—When Used for Any Product Authorized for Shipment Therein). Standard; adopted 1936, revised 1943. Includes specification for two types—(a) with plain mouth; (b) with ground mouth and vented or unvented ground-in glass stopper to fit; covers design, capacity, weight, glass, manufacture, marking, and inspection; and drawings showing dimensions and embossing.

Manufacturing Chemists' Assn. of the U.S. Manual Sheets C-5 and C-6. Carboys, Glass, Boxed—Warning Labels. When used for any product authorized for shipment therein, except nitric acid (C-5). Standard, adopted 1938. For carboys containing nitric acid (C-6). Standard, adopted 1939.

U. S. Gov., Army Air Forces. Specification 40768-1; 1944. Carboy; Five-Gallon Non-Vented (for Shipment and Storage of Acids).

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container. Specification 1A, Boxed Carboys (Glass, Earthenware, Clay, or Stoneware); Specification 1B, Boxed Lead Carboys; Specification 1C, Carboys in Kegs (Glass, Earthenware, Clay, or Stoneware). Includes requirements for manufacture of carboys, outside containers, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 1X. Boxed Carboys, 5 to 6 Gallons, for Export Only (Glass, Earthenware, Clay, or Stoneware). Single-Trip Container. Includes requirements for manufacture, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 28 and 28A. Metal Jacketed Head Carboys. Include requirements for size, test, construction, and marking. Published by American Trucking Assns., Inc., Tariff Bureau. and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 34B. Aluminum Carboys. Includes requirements for material, construction, marking, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Navy Dept. Specification 51 C 35; 1943. Carboys, Glass, Five-Gallon; and Crates, Tilter-Top.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2280A; 1942. Bottle; Narrow Mouth, 5-Gallon Carboy.

References.—Sheet lead, methods of analysis of lead, *see* 651.5, 651.0.

955.3 FLASKS

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-222; 1939. Decorated Oval Wine Flask.

References.—Laboratory flasks, *see* 918.9.

955.4 JARS

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-704; 1939. Plain Round Wide Mouth Food Container Jar.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-722; 1938. Oval Wide Mouth Food Container Jar.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-760; 1941. Two-Pound Tabl-Serv Round Preserve Jar.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-782; 1942. Economy Line Plain Round Jar.

Glass Container Assn. of America. Standard Glass Container Blue Print. Drawing C-800; 1939. Shellac and Paint Jars.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R91-32; 1932. Glass Containers for Preserves, Jellies, and Apple Butter. This recommendation establishes a list of stock sizes and capacities of glass containers for preserves, jellies, and apple butter. Sponsored by National Preservers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R196-42; 1942. Glass Containers for Green Olives (Capacities, Dimensions, and Packaging). Establishes 12 bottle sizes in lieu of at least 90 different varieties of bottles that have been used. Gives requirements for trade designation, style, capacity, maximum weight of glass, dimensions, finish size, and number of packages to shipping case.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R197; 1942. Glass Containers for Maraschino Cherries (Capacities, Dimensions, and Packaging). Covers reduction in variety and sizes for the benefit of packers, bottle manufacturers, distributors, and consumers. Gives requirements for package sizes, capacity, weight of glass, height and dimensions, finish, and number of packages to shipping case for vase-shaped bottle sizes for retail and large utility or institutional sizes.

References.—Jar top finishes, *see* 955.0; jar for water cooler, *see* 955.6; rubber jar rings, *see* 208.6; sealing wax for jars, *see* 719.59.

955.5 DEMIJOHNS

955.6 WATER COOLERS

American Hospital Assn., 34-91. Ice-Cooled Water Coolers (Inverted-Bottle Type). Covers two types in 3- and 5-gal. capacities. Based on U. S. Gov. Federal Specification RR-C-571a.

U. S. Gov., Federal Specification OO-C-566a; 1944. Amendment 1; 1944. Coolers; Drinking-Water, Electric. Covers three types—(A) bubbler storage type, for marine use, air cooled; (B) bubbler storage type, for land use, air cooled; and (D) cafeteria storage type, for land use, air cooled. Gives requirements for materials, workmanship, cabinet, finish, top, bubblers, glass fillers, hardware, storage tanks, evaporators, tubing, thermal insulation, refrigerating mechanism, refrigerant, motor and control, piping, condenser, overload requirements, and details for each type; methods of sampling, inspection, and tests; and packing and marking for shipment.

U. S. Gov., Federal Specification RR-C-571a; 1939. Coolers; Water, Ice-Cooled (Inverted-Bottle Type). Covers two types—(I) stand and (II) cabinet; and two sizes—3- and 5-gal. Gives requirements for ice containers, water-cooling container, lid, service faucets, waste faucets, water bottles, stand, and finish; methods of inspection and tests; and requirements for packing and marking for shipment.

U. S. Gov., Navy Dept. Specification 63C4; 1941. Coolers (Fountains); Drinking-Water, Electric, Portable.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Electric Drinking-Water Coolers, 1941.

955.7 JUGS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R 203-44; 1944. Containers and Packages for Household Insecticides (Liquid Spray Type). Gives various dimensions for retail packages (Boston round bottle and glass jug) for pint, quart, gallon bottle, and gallon jug; and covers industrial packages (5-gal. and 54-gal. steel drums). Sponsored by National Assn. of Insecticide and Disinfectant Mfrs., Inc.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 31. Jugs in Tubs. Includes requirements for material, size, construction, cushioning, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

955.9 MISCELLANEOUS GLASS CONTAINERS

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 96-61-17; 1941. Bucket; Glass, 5-Gallon.

956. CYLINDERS AND TANKS

956.1 CYLINDERS AS CONTAINERS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1944. Seamless Steel Containers. Include rules for inspection and tests.

American Standards Assn., Z 48.1-1942. Marking Compressed Gas Cylinders To Identify Content. For Marking portable compressed gas cylinders so that their content may be readily identified to the extent necessary to prevent the probability of explosions or accidents from their misuse.

Compressed Gas Manufacturers' Assn. Safety Device Schedule, 1936. Recommendations for safety devices applied to cylinders of a capacity up to 1,000 lb. of water, in accordance with requirements of the Bureau of Explosives; classification as frangible disc, fusible plubs, combination frangible disc-fusible plugs, and pop valves; definitions, design and construction, and regulations of the Interstate Commerce Commission as to applications for various compressed and liquefied gases.

National Board of Fire Underwriters. Liquefied Petroleum Gases, No. 58; 1940. Standards for the design, installation, and construction of containers and pertinent equipment for storage and handling of liquefied petroleum gas. Gives basic rules and details for systems utilizing containers constructed in accordance with Interstate Commerce Commission Specifications, systems utilizing storage containers other than those constructed in accordance with I.C.C. specifications, containers and pertinent equipment for tank truck and trailers for the transportation of liquefied petroleum gases, containers and pertinent equipment for utilizing liquefied petroleum gas as a motor fuel, and appendices.

U. S. Gov., Army Air Forces. Specification 40754-1; 1944. Cylinder; Oxygen, Type A-6, Low Pressure, Portable.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-51a-2; 1943. Cylinders; Nonshatterable, Oxygen.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-73a; 1944. Cylinders; Nonshatterable, CO_2.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-105; 1943. Cylinders; 0.280 Ounce Capacity, CO_2.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook, H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); miscellaneous standardized product threads of American National thread form or American National Pipe-Thread form; and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

U. S. Gov., Federal Specification RR-C-901; 1936. Cylinders; Steel, Seamless, Type 3a (for Compressed Gases). Minimum capacity of 2,640 cu. in., which when charged with oxygen to a pressure of 2,000 lb. per square inch gage at a temperature of 70° F. (21.1° C.) will deliver 220 cu. ft. of the gas at the same temperature and a pressure of 30 in. of mercury. Gives requirements for material, workmanship, construction, heat treatment, dimension and weight; methods of sampling, inspection, and tests; and requirements for marking.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container. Specification 3A, Seamless Steel Cylinders (not over 1,000 lb.) water capacity, at least 150 lb. per square inch service pressure; Specification 3B, Seamless Steel Cylinders (service pressure at least 150 to not over 500 lb. per square inch); Specification 3C, Seamless Steel Cylinders (service pressure at least 90 to not over 300 lb. per square inch); Specification 3D, Seamless Steel Cylinders (not over 125 lb. water capacity, service pressure must be 480 lb. per square inch); Specification 3E, Seamless Steel Cylinders (must be 1,800 lb. per square inch). Includes requirements for type and size, service pressure, inspection, material, construction, tests, rejection, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 3BN. Seamless Nickel Cylinders (not over 125 lb. water capacity, at least 150 to not over 500 lb. per square inch service pressure). Covers requirements for type, sizes, inspection, manufacture, thickness, heat treatment, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container. Specification 4, Forge Welded Steel Cylinders (not over 1,000 lb. water capacity, service pressure must be 300 lb. per square inch); Specification 4A, Forge Welded Steel Cylinders (not over 1,000 lb. water capacity, service pressure at least 150 to not over 500 lb. per square inch). Covers requirements for type, size, service pressure, material, wall thicknesses, and tests. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Containers. Specification 4B, Welded and Brazed Steel Cylinders (not over 1,000 lb. water capacity, at least 150 to not over 500 lb. per square inch service pressure); Specification 4C, Welded and Brazed Steel Cylinders (not over 1,000 lb. water capacity, at least 90 to not over 300 lb. per square inch service pressure). Covers requirements for type, size, material, inspection, manufacture, wall thicknesses, and test. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 8. Steel Cylinders With Approved Porous Filling for Acetylene, (service pressure of 250 lb. per square inch at 70° F.). Includes requirements for inspection and report, material, construction, tests, porous filling, rejected cylinders, tare weight, marking, report, and special types. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 9. Steel Cylinders, Seamless, Welded or Brazen. Includes requirements for type inspection and report, material, construction, tests, porous filling, rejected cylinders, tare weight, marking, report, and additional type. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Navy Dept. Specification 51C24e; 1944. Cylinders; CO_2-Gas-Filled, for Inflatable Life Jackets.

U. S. Gov., Navy Dept. Specification 51C30a; 1944. Cylinders; Acetylene.

U. S. Gov., Navy Dept. Specification 51C36; 1944. Cylinders, CO_2-Gas-Filled, Commercial-Type, for Inflatable Life Belts.

U. S. Gov., Navy Dept. Specification 51F5a; 1943. Flasks; Steel (Nonshatterable), Seamless, for Storing Compressed Air.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40321; 1940. Cylinder; Oxygen, Type G-1, Low Pressure.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40355-A; 1945. Cylinder; Oxygen, Type D-2, Low Pressure.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40356; 1942. Cylinder; Oxygen, Type F-2, Low Pressure.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40642; 1944. Cylinder; Oxygen, Type H-2, Emergency.

U. S. Gov., U. S. Army, Army Air Forces. Specification 100-7-A; 1928. Cylinder; Standard Gas, 2,640 Cubic Inches.

U. S. Gov., U. S. Army, Chemical Warefare Service. Specification 96-91-3; 1932. Container; Portable, Chemical Cylinder, M11.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 100-13A; 1943. Miscellaneous Lubricant Container and Packaging.

References.—Methods of testing and general requirements for metals, *see* 600.1; regulators and valves for cylinders, *see* 607.6, 645.4; welding equipment, *see* 767.

956.2 TANKS

American Petroleum Institute, Div. of Production. Standard 12-E; 1944. Standard for Wooden Tanks, Tentative. This specification covers new material, represents minimum requirements, and is designated to provide the industry with a standard series of wooden tanks comprising adequate ranges of sizes in the various types required to meet oil field requirements, built in accordance with good modern manufacturing and erection practice. Covers types and sizes, materials, design, construction, erection, appurtenances, marking, and inspection and rejection.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Tank Hoops. Gives requirements for material, shape, spacing, threads, nuts, lugs, and workmanship.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Timber Substructures for Water Tank (50,000 and 100,000-Gal. Capacity). Gives requirements for timber, workmanship, painting, and treating; and drawings showing recommended types and designs.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1943. Specifications for Steel Substructures for Wood Water Tank (50,000 and 100,000-Gal. Capacity). Structure will consist of 12-post steel tower, complete in all details. Gives requirements for material, workmanship, and painting.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1944. Specifications for Welded Steel Tanks for Railway Water Service. Apply to the construction of fusion arc welded steel water storage tanks. Covers general requirements, materials, design, welding, testing, painting and inspection, and accessories and fittings.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Wood Water Tank (50,000 and 100,000-Gal. Capacity). Gives requirements for material, size, shape, bottom, staves, and workmanship.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume I. Structural Details, 1938. For wooden water tanks, standard sizes, form, kinds of lumber permitted for staves and bottom, hoops and steel shapes according to A.S.T.M. specifications, dead, live, and wind load computations, allowable unit stresses, details of design.

Associated Factory Mutual Fire Insurance Companies. Specifications for Gravity Water Tanks and Steel Towers, Volume II; 1940. Piping, Fittings, and Heating Systems. For water tanks, requirements for discharge pipe and fittings, expansion joint, filling, overflow, clean-out and drain, mill-use connections, water level indicator, valve pit or house, frost-proof casings for pipes. Specifications for tank heating equipments, including method of determining necessary heater capacities.

National Board of Fire Underwriters. Gravity and Pressure Tanks, No. 22; 1941. Standards for gravity tanks which are usually built of wood or steel and are often supported on towers, ordinarily of steel although reinforced concrete towers are sometimes used. Covers general information and recommendations, steel gravity water tanks, steel towers, wooden water tanks, foundations, approval, pipe connections and fittings, valve enclosures and frost protection, tank heating equipment, pressure tanks, figures, and tables.

National Board of Fire Underwriters. Dip Tanks, Including Hardening and Tempering Tanks, Flow Coat Work, No. 34; 1941. Standards for use of tanks containing flammable liquids. Covers three classes—(A) tanks exceeding 10 sq. ft. in liquid surface area, (B) small tanks up to 10 sq. ft. in liquid surface area, and (C) all tanks which do not contain flammable solvents or with solvents having a flashpoint of over 100° F. Gives introduction, classification, general rules, special requirements, and special protection for dip tanks. Also details for hardening and tempering tanks and for flow coat work.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Gravity and Pressure Tanks. Standards for the construction and installation of gravity and pressure tanks. Covers information and recommendations, steel gravity water tanks, steel towers, wooden water tanks, foundations, approval, pipe connections and fittings, valve enclosures and frost protection, tank heating equipments, and pressure tanks.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Dip Tanks (Containing Flammable Liquids). Covers classification of tanks, location, storage of flammable liquids, control of hazards, ventilation, construction and installation, hoods and curtains, automatic heat actuated devices, fire protection, and special requirements for various classes.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Flammable Liquids Ordinance, Suggested Ordinance Regulating the Use, Handling, Storage, and Sale of Flammable Liquids and the Products Thereof. Includes new and existing installations for three classes of liquids with flash point below 200° F. closed cup tester, definitions, general requirements, capacity and location of storage tanks, piping and appurtenances, petroleum products, paints, varnishes, etc. Appendix on safeguards for tanks in flooded regions.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Leakage From Underground Gasoline Tanks. Describes and analyzes a number of unusual cases of gasoline leakage and covers suggestions for the installation of tanks, suggested procedure for locating the source of underground gasoline leakage, and miscellaneous suggestions.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Liquefied Petroleum Gases. Standards for the design, installation, and construction of containers and pertinent equipment for the storage and handling of liquefied petroleum gases. Covers application of rules, basic rules, systems utilizing I.C.C. containers, systems utilizing containers other than I.C.C., tank trucks for liquefied petroleum gases, liquefied petroleum gas as a motor fuel, storage of containers not installed for use at final utilization point, and required sizes of safety valves for containers.

Underwriters' Laboratories, Inc. Standard for Inside Tanks for Oil Burners, Subject 80; 1934. Applies to steel tanks, of capacities of 275 U. S. gallons and less, intended for use in basements of buildings for the storage and supply of oil fuels for oil burners. Gives size and form, material and thickness, heads and seams, pipe connections, factory test, coating, preparation for shipment, design test of assembly, drawings of joints, and instructions to inspectors.

U. S. Gov., Army Air Forces. Specification 28419-C (2); 1943. Tank; Fuel, Self-Sealing, Bulletproof, General Specification for.

U. S. Gov., Army Air Forces. Specification 28495-A-3; 1945. Tank; Jettison Fuel, General Specification for.

U. S. Gov., Army Air Forces. Specification No.40609; 1943. Cell; Fuel Storage, 1,000-Gallon.

U. S. Gov., Army Air Forces. Specification 40795; 1944. Tank; Aircraft Engine Preoiler, Type B-1.

U. S. Gov., Army-Navy Aeronautical Specification AN-V-7-2; 1944. Vibration Tests of Fuel Oil, and Miscellaneous Tanks; Process for.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.345. Tank; Water, Canvas.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Vehicle Tanks. This is an assembly used for the delivery of liquids, comprising a tank, which may or may not be subdivided into two or more compartments, mounted upon a wagon, automobile truck, or trailer, together with its accessory piping, valves, meters, etc. Covers specifications applicable both to vehicle tanks used as measures and to vehicle tanks equipped with meters. Allowable tolerances are also given on vehicle-tank compartments which are being tested for the first time and on subsequent tests.

U. S. Gov., Interstate Commerce Commission. Motor Vehicle Cargo Tank Specification MC300, MC301, MC302, and MC303. Cargo tanks to be mounted on and to form part of tank motor vehicles for transportation of inflammable liquids and poisonous liquids, class B. Tanks to be constructed of the following types of metal—MC300, mild (open hearth or blue annealed) steel; MC301, welded aluminum alloy, grade 3S; MC302, welded aluminum alloy, grade 52S; and 303, welded ferrous alloy, high-tensile steel. Published by American Trucking Assns., Inc., Tariff Bureau.

U.S. Gov., Interstate Commerce Commission. Motor Vehicle Cargo Tank Specification MC310 and MC320. Cargo tanks to be mounted or to form part of tank motor vehicles. MC310, primarily designed to apply to vehicles used for the transportation of corrosive liquids; and MC320, to apply to vehicles to be used for the transportation of liquid petroleum gases. Published by the American Trucking Assns., Inc., Tariff Bureau.

U. S. Gov., Marine Corps Specification, 1943. Tank, Oil, Pressure, for Burner, Oil, M-1942.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 8Yd; 1934. Tanks; Steel and Wood.

U.S. Gov., U. S. Army, Army Air Forces. Specification 75-272; 1943. Tank; Processing 4 by 5-Inch Film.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-295; 1943. Tank; Photographic, Film Developing, 8 by 10-Inch Film.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40454-A; 1944. Tank; Collapsible Water, Photographic.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 6-34C; 1943. Tank; Storage, Canvas, Water, 3,000-Gallon.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-6C; 1942. Tank; Watering, M-1940.

References.—Tank cars, automobile tank trucks, *see* 726.1, 722.1; steel oil storage tanks, water tanks pressure tanks, *see* 605.23; range boilers, expansion tanks, fuel tanks, *see* 614.1, 614.3; concrete fuel oil tanks, *see* 518.71; steel plates for tanks, rivets, *see* 604., 608.4; lumber tank stock, *see* 413.1; steel tank hoops, *see* 604.22; methods of testing, general requirements for metals, *see* 600.1.

957. BAGS AND SACKS

957.1 CLOTH BAGS AND SACKS

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.31. Bag; Packsaddle.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-35. Bag; Water, 2 and 5-Gallon.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 37. Bag; Water, Man Pack.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 56-2-S. Bag; Pack, for Linen Hose.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-60-S. Bag; Cloth, Lunch.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-12C; 1939. Bag; Canvas, Field, Olive-Drab, M1936.

957.11 Fuel Bags

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-212A; 1938. Bag; Canvas, Coal, 1-Bushel.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-213B; 1942. Bag; Canvas, Coal, 2-Bushel.

957.12 Mail Bags

U. S. Gov., Navy Dept. Specification 53B3a; 1937. Bags; Mailing, Cotton.

U. S. Gov., Treasury Dept., Procurement Div., No.551; 1942. Bags; Mailing, Cotton. Covers one type and grade in the following sizes—size 1, small, 3 in. wide by 4 in. deep; size 2, large, 4 1/2 in. wide by 8 in. deep. Gives requirements for construction, bag, stitching, seams, printing, on bag; tag; tag dimensions, printing on tag, and drawstring; methods of sampling, inspection, and test; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-226B; 1942. Bag; Canvas, Mail, With Leather Bottom, Top, and Locking Strap.

957.13 Sand Bags

U. S. Gov., Marine Corps Specification, 1942. Bag; Sand.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-43A; 1926. Bag; Sand.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 14-7B; 1929. Bag; Sand, Burlap.

U. S. Gov.. U. S. Army, Medical Dept. Specification 10-2546; 1939. Bag; Sand, X-Ray.

957.14 Tool Bags

Assn. of American Railroads, Telegraph and Telephone Section, 1-A-47; 1931. Lineman's Canvas Tool Bag ARA-1-A. Requirements for weight of cotton duck, leather, linen thread, steel frame, hardware, and workmanship, with dimensional drawing of bag.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-297; 1942. Bags; Canvas, Hardware, Rivets, Etc., for Chest, Supply, and Tool Sets.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-301; 1942. Roll; Tool, Canvas (Empty), for Tools Sets, Horseshoers'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-302; 1942. Roll; Tool, Canvas, Saddlers' and Carpenters' (Empty), for Chest, Supply Saddlers' (Pack Artillery).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-373; 1927. Bag; Type BG-44, Canvas, Tool.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-544; 1930. Tool Roll; Type BG-10, Cotton Duck.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1054; 1941. Tool Roll; Type BG-30.

957.15 Clothes Bags

U. S. Gov., Marine Corps Specification, 1942. Bag; Clothing (Emergency Alternate).

U. S. Gov., Navy Dept. Specification 24 B 8b; 1943. Bags; Clothes.

957.19 Miscellaneous Cloth Bags

American Society for Testing Materials, D 205-39; 1939. Specifications and Methods of Test for Osnaburg Cement Sacks. Applies to Osnaburg cement sacks and to fabric used in their construction. Gives tolerances, samples, and details for osnaburg fabric and for osnaburg sacks.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Burlap and Burlap Bags. Covers definition, properties, forms available, occurrences, grades, specifications substitutes, uses, and specifications for burlap bags.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No. 7. Contains requirements for bags for shipment of calcium chloride, magnesium chloride, deodorants and disinfectants (other than medicinal), dust laying compound, flour, corn meal, rice, sugar, beans, grain flour, and insecticides. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No. 7-1943.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 36A. Lined Cloth Bags (Triplex). Includes requirements for capacity, material, construction, marking, and closing for shipment. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 36B. Burlap Bags; Lined. Includes requirements for capacity, construction, marking, and closing for shipment. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 45B. Bags; Cloth and Paper, Lined. Includes requirements for materials and construction, marking, and closing for shipment. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Marine Corps Specification, 1943. Bag; Canvas, Field, Olive-Drab, M-1942 (Complete).

U. S. Gov., Marine Corps Specification, 1944. Bag; Message, Drop and Pick-Up, MBG-1, With Streamer and Cord.

U. S. Gov., Marine Corps Specification, 1942. Bag; Water, Sterilizing, Complete With Cover and Hanger (Emergency Alternate).

U. S. Gov., Navy Dept. Specification 24B9b; 1944. Bags; Canvas, 800-Pound Capacity.

U. S. Gov., Navy Dept. Specification 24B10a; 1942. Bags; Hammock, Canvas.

U. S. Gov., Navy Dept. Specification 56B30c; 1942. Bags; Coffee.

U. S. Gov., Treasury Dept., Procurement Div., No. 697; 1944. Covers; Hot-Water Bottle. Covers one type. Gives requirements for material, workmanship, description, fabric, tape, thread, stitching, and tolerance; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 700; 1944. Bags; Ice-Cap. Covers one type. Gives requirements for material, workmanship, fabrics, tape, thread, stitching, and tolerance; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., No. 718; 1945. Bags; Cotton, for Seed and Soil Samples. Covers one Type. Gives requirements for material, workmanship, construction, size, minimum dimensions, weight per square yard, threads per inch, minimum breaking strength, and seams and stitching; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 6-259; 1939. Bag; Canvas, Carrying (Explosive), With Sling.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 6-303; 1941. Case; Paddle.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-250; 1938. Bags; Conveyor and Laundry.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-272; 1939. Bag; Patient's.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-279; 1939. Bag; Wardrobe.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2734; 1939. Bag; Buckshot, for Balkan Frame.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-206C; 1942. Bag; Feed, M-1938.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-218A; 1938. Sacks; Supply, Nos. 1 and 2.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-223A; 1937. Bag; Grain, M-1912.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-227B; 1942. Bag; Canvas, Nail.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-245; 1937. Bag; Barrack.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-290; 1940. Bag, Candle; and Bag, Utensils (Outfit, Cooking, Cavalry Pack).

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-3A; 1940. Bag; Spare Parts; and Bag, Hair Canvas, Phillips Pack Saddle.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-S-9; 1939. Saddlebag; Canvas, M1924, Substitute.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-12; 1933. Sack; Harness, M-1911, for Artillery Harness.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-30A; 1942. Bag; Water, 30-Gallon, Pack Mule.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-S53; 1939. Bag; Cantle, Canvas, M1936, Substitute.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-510A; 1940. Bag; Type BG-49, Canvas, for Radio Parts.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-511A; 1939. Bag; Type BG-50.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-540; 1930. Cover; Type BG-51, Telephone.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-922B; 1942. Bag; Type BG-71, Radio Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-982; 1940. Bag; Types BG-72 and BG-73.

U. S. Gov., U. S. Army, Signal Corps. Specification 72-47; 1944. Message Bag; BG-121.

U. S. Gov., U. S. Maritime Commission. Specification 24-MC-2; 1940. Bags; Laundry. Shall be round-bottom type, in one grade, and shall be 57 in. in circumference, and 45 in. high, unless otherwise specified. Gives requirements for material, workmanship, construction, tolerances, sampling, inspection, and tests.

References.—Jute burlap, *see* 322.1; tolerances on fabrics, methods of testing, standard sizes and weights, *see* 303.0, 300.4, 300.6; stitches and stitching, *see* 300.7.

957.2 PAPER BAGS AND PAPER LINING FOR BOXES

American Hospital Assn., 55-1. Grocers' Kraft Paper Bags. Covers 1 type and 3 classes in 16 sizes each. Based on U. S. Gov. Federal Specification UU-B-36.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Bags; Paper. Covers definition and kinds.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R42-43; 1943. Grocers Paper Bags. Covers four types of bags—self-opening (automatic), square, flat, and sack (satchel bottom). Establishes a simplified list showing sizes, minimum capacities, dimensions, and weights of paper for each type of bag; and symbols showing compliance with this recommendation.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R107-31; 1931. Glassine Bags. This recommendation establishes a simplified list of sizes for flat and square glassine paper bags.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R129-41; 1941. Notion and Millinery Paper Bags (used by department and specialty stores). This recommendation establishes a simplified list of stock sizes of notion and millinery paper bags for use by department and specialty stores. Gives tables showing bag number, size of bag, and basic weight of paper for notion and millinery paper bags and tapered paper bags. Sponsored by National Retail Dry Goods Assn.

U. S. Gov., Federal Specification UU-B-36a; 1943. Bags; Paper, Grocers. Covers three types—(I) bags, self-opening; (II) bags, square; and (III) bags, satchel-bottom. Gives requirements for sizes, weights, material, workmanship, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification UU-S-48; 1943. Amendment 2; 1944. Sacks; Paper, Shipping. Covers five types—(I) pasted open mouth, (II) sewn or open, (III) pasted valve, (IV) sewn valve, and (V) sewn open corner; and four classes—(A) unbleached heavy-duty shipping sack kraft paper, (B) asphalted kraft paper, (C) paraffined kraft paper, and (D) other papers as specified by the procuring agency. Gives requirements for paper, details for each type and class; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No.7. Contains requirements for bags for shipment of calcium chloride, magnesium chloride, deodorants and disinfectants (other than medicinal), dust laying compound, flour, corn meal, rice, sugar, beans, grain flour, and insecticides. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No.7-1943.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2D. Inside Containers—Duplex Paper Bags. Includes requirements for material, construction, and test. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container. Specification 2J, Inside Containers—Waterproof Paper Bags for Linings; Specification 2K, Inside Containers—Paper Bags for Linings; Specification 2L, Lining for Boxes (Kraft Paper Bag Option). Cover requirements for material, test, and construction. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2M. Waterproofed Paper Lining. Covers strength, construction, and shall fully protect contents at top of box. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 44B. Paper Bags. Includes requirements for construction, closure, tests, and marking. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 45B. Bags; Cloth and Paper, Lined. Includes requirements for materials and construction, marking, and closing for shipment. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Navy Dept. Specification 53B9e; 1943. Bags; Paper, Multiwall, Portland-Cement.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 19-8A; 1929. Liner; Gas-Mask Packing Box.

U. S. Gov., Veterans Administration. Specification VA-G-65; 1933. Bags; Paper, Grocer's.

References.—Bag and wrapping paper, *see* 477; methods of testing paper, *see* 470.3.

957.3 CARRYING BAGS

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 56-1. Bag; Pack Board.

U. S. Gov., U. S. Army, Army Air Forces. Specification 6-289; 1940. Bag; Clothing, Type B-4, Aircraft.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-640; 1932. Bag; Type GB-53, Canvas, for Carrying Cords.

957.4 RUBBER BAGS

References.—Rubber bags and bottles, *see* 204.2.

957.9 MISCELLANEOUS BAGS AND SACKS

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-54-S. Bag; Cellophane, Lunch.

958. CHESTS, TRUNKS, AND SUITCASES

958.1 ENGINEERS' CHESTS AND KITS

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-1C; 1944. Boxes, Chests, and Crates; Engineer Equipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-6; 1922. Chest; Drafting, Company Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-7; 1922. Chest "A"; Drafting, Regimental, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-8; 1922. Chest "B"; Drafting, Regimental, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-9; 1922. Chest; Drafting, Batallion, Artillery.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-10; 1922. Crate "C"; Drafting, Regimental, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-13; 1922. Chest; Tool, Pioneer, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-40; 1926. Chest "A"; Electric Lighting Set, Portable, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-41; 1926. Chest "B"; Electric Lighting Set, Portable, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-42; 1926. Chest "C"; Electric Lighting Set, Portable, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-55A; 1927. Chest; Drafting and Duplicating Equipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42-30; 1938. Chest; Sketching, Equipment.

958.2 TOOL CHESTS AND KITS

Assn. of American Railroads, Telegraph and Telephone Section, 2-G-68; 1932. Parts and Tool Carrying Case. Case constructed of three-ply cotton wood, lined with japanned truck iron, covered with black vulcanized case fiber, leather covered handle, and with folding inner tray of the cantilever type, and working drawings of construction.

U. S. Gov., Army Air Forces. Specification 24846 (1); 1943. Kit; Gun Bore Sight, Type J-2.

U. S. Gov., Army Air Forces. Specification 24870; 1943. Kit; Projector Boresight, Type Q-1.

U. S. Gov., Army Air Forces. Specification 40447; 1942. Case; Tool, Mechanics', Type G-2, Grease Gun.

U. S. Gov., Army Air Forces. Specification 40652; 1943. Kit; Tire Removing and Mounting, Type S-1.

U. S. Gov., Army Air Forces. Specification 40684 (1); 1944. Kit; Cable Vulcanizing, Type X-1, Portable, Field Lighting.

U. S. Gov., Army Air Forces. Specification 40696-A-3; 1944. Kit; Acrylate and Cellulose Acetate, Utility Repair, Type Y-1.

U. S. Gov., Army Air Forces. Specification 40714 (3); 1944. Case; Mechanics' Tool, Type G-4.

U. S. Gov., Army Air Forces. Specification 40715 (3); 1944. Case; Mechanics' Tool, Type G-5.

U. S. Gov., Army Air Forces. Specification 40758-4; 1944. Kit; Pressure Demand Oxygen Maintenance, Type CC-1.

U. S. Gov., U. S. Army, Army Air Forces. Specification 75-209; 1942. Kit; Tool and Repair, Photographic, Type G-1, Aerial Camera.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40752; 1944. Case; Mechanics' Tool, Type G-6, Grease Gun.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40760; 1944. Kit; Oxygen Testing, Type K-2, Squadron-Aircraft.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-1B; 1937. Kit; Repair, Company, Gas-Mask, MII.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-60A; 1930. Chest; Blacksmith, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-63A; 1926. Chest; Pipe-Fitting Tools.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-64; 1923. Chest; Sign Painting, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-65; 1924. Crate; Sign Painting, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-101; 1930. Chest; Carpenter, Platoon, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-102A; 1931. Chest; Demolition, Platoon, Engineer.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 23-103; 1930. Box; Tinsmiths' Equipment.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.1-4; 1921. Kit; Repair, Steel Tape.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2953; 1939. Chest; Tool, Empty, Medical.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-170B; 1942. Kit; Tool, Canvas, M1921.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-221; 1934. Kit; Tool, Canvas, Waterproof, Satchel Type, 18-Inch.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-296; 1941. Rolls; Tool, Canvas, Bits and Files, and Chisels (Empty), for Tool Set, Carpenters' and Wheelwrights'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 9-85; 1940. Roll; Pioneer, M-1, Complete With Tools.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-24A; 1942. Chest; Tool, Blacksmith, Empty, for Tool Set; Complete With Tool, Blacksmith No. 1.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-25A; 1942. Chest; Tool, Carpenters' and Wheelwrights'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-27; 1921. Chest; Tool, Horseshoers' and Saddlers'.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-96; 1941. Box; Tool, Metal, Empty, for Range, Field, M-1937.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-8A; 1938. Roll; Tool, Canvas, Phillips Pack Saddle, With Contents.

U. S. Gov., U. S. Army, Signal Corps. Specification 17-164A; 1942. Tool Sets; Types TE-6 and TE-11, Mechanics'.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-257A; 1936. Tool Equipment; Type TE-5, Signal Man's Pocket Tool Kit.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-435A; 1936. Tool Equipment; Type TE-29, Pocket Tool Kit.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-619; 1931. Case; Type CS-38, for Carrying Radio Tools.

958.3 TRUNKS AND SUITCASES

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specifications 32A, 32B, 32C, and 32D. Metal Cases and Trunk. Includes requirements for gage standards, covers, edge protection, bottom protection, hinges, carrying handles, closing devices, rivets, rivet reinforcement, lining, metal partitions, protective coating, tests, and marking—32A, metal cases, riveted or lock-seamed; 32B, metal cases, welded or riveted; 32C, trunks; and 32D, metal boxes for old and worn-out motion-picture film no longer exhibitable. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Navy Dept. Specification 57S15; 1941. Suitcases; Hard-Fiber.

958.9 MISCELLANEOUS CHESTS AND KITS

Safe Manufacturers' National Assn. Specification for Burglary-Resistive Chests, B1; 1939. Covers round door chests, rectangular door chests, cash protective units, etc., but not including chests with a deposit slot accessible when the door is closed; requirements for body and door thickness, locking mechanism, materials, and clearance.

U. S. Gov., Army Air Forces. Specification 40455; 1943. Kit; Emergency Sustenance, Type E-4, Cooking.

U. S. Gov., Army Air Forces. Specification 40681 (2); 1944. Kit; Emergency Sustenance, Type E-14, Desert and Tropic-Aerial Delivery.

U. S. Gov., Army Air Forces. Specification 40685; 1943. Packet; Trading.

U. S. Gov., Army Air Forces. Specification 40753 (1); 1944. Kit; Emergency Sustenance, Type E-16, Aerial Delivery, Northern Ration Replenishing.

U. S. Gov., Army Air Forces. Specification 40791; 1944. Kit; Testing, Type EE-1, Electrical Equipment.

U. S. Gov., Army Air Forces. Specification 40840-1; 1944. Kit; Emergency Sustenance, Type E-17, Personal Aids.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 210-1. Kit; Roll-Up Container, Canvas.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 250-S. Outfit; Emergency, Telephone Communication.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 274-S. Kits; Power Pump Tool and Accessory List.

U. S. Gov., Navy Dept. Specification 27S13; 1941. Sewing Outfits.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40443; 1942. Kit; Emergency, Type B-3, Jungle-Parachute Seat Pad.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40492; 1944. Kit; Emergency Sustenance, Type E-9A, Desert and Ocean Rations, Aerial Delivery.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-268A; 1940. Kit; Individual, M. D., Component Parts.

U. S. Gov., U. S. Army, Medical Dept. Specification 6-274; 1939. Kit; First Aid, Aeronautic, Empty.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2880; 1939. Chest; Clipping, Empty.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2955; 1939. Container; Metal, for Instruments.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2956; 1939. Chest; Physical Examination Sets, Empty.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2957; 1939. Container; Metal, for Four Knives.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2958; 1939. Chest; Wooden, Empty, Medical.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2983; 1941. Chest; Pioneer, Empty.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 6-231; 1935. Wallet; Pocket, for Wood-Wind Instrument Repair Kit, Without Contents.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 23-107; 1941. Chest; Supply, Pack Artillery, Empty.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-1B; 1942. Outfit; Officers' Mess, M-1937, Chest.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 92-25; 1936. Chest; Lantern.

U. S. Gov., U. S. Army, Signal Corps. Specification 23-37C; 1931. Chest; Types BE-49 and BE-50, Components of Radio Sets.

U. S. Gov., U. S. Army, Signal Corps. Specification 46-8; 1944. Chest; CH-40-B, Carrying and Testing, Microphone T-21-B, Sound Ranging.

U. S. Gov., U. S. Army, Signal Corps. Specification 46-12; 1944. Chests; CH-44-A to CH-48-A, Inclusive, Carrying, Sound Ranging Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-104-A; 1941. Chest; Type BC-5, Part, for General Use.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-200-C; 1927. Chest; Type CH-2, Component of Radio Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-208C; 1927. Chest; Type CH-1, Component of Radio Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-392A; 1929. Chest; Type CH-4, Radio Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-410; 1929. Chest; Type CH-5, Radio Set.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-566A; 1943. Chest; CH-21.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-593; 1931. Chest; Type CH-11, Component of Radio Sets.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-594; 1931. Chest; Type CH-12, Component of Radio Sets.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-595; 1931. Chest; Type CH-13, Component of Radio Sets.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-624A; 1931. Chest; Type CH-24, for Signal Lamp.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-659A; 1940. Chest; Type CH-28, CH-29, CH-38, and CH-39, Radio Carrying.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-663A; 1940. Chest; Type CH-23, Pack Load.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-711; 1935. Box; Types BS-8 and BS-9, for Carrying Spare Vacuum Tubes.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-720B; 1943. Chest; CH-32-A, Radio Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-908; 1937. Chest; Type CH-27-A, Carrying, Radio Transmitter.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-920; 1937. Chest; Type CH-33, Radio Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-931; 1937. Box; Type BE-63, Telephone, Outdoor.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-954A; 1943. Chest; CH-49, Carrying, Radio Receiving.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-963; 1939. Chest; Type CH-43, Infantry Pack.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-980; 1940. Chest; Type CH-56.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-981; 1940. Box; Type BX-22.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1028; 1942. Chest; Type CH-64, Maintenance Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1040A; 1943. Chest; CH-53-A'43.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1042; 1941. Chest; Type CH-30.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1045; 1941. Chest; CH-65, Maintenance Equipment.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1047; 1941. Chest; Type CH-69, for Maintenance Equipment, ME-7.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1160; 1942. Chest; CH-80-( ), 4-Drawer, for 256 Crystal Unit, DC-11-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1528; 1942. Chest; CH-96; and Box, BX-40.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1638A; 1943. Chests; CH-116 and CH-117, for Facsimile Equipment, RC-120-( ).

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1652; 1943. Chests and Boxes, for Radio Direction-finder Central TC-8 and Radio-intercept Central TC-9.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1674; 1944. Chest; CY-64/U.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-1699; 1944. Chest; CH-219.

U. S. Gov., U. S. Maritime Commission. Specification 1-MC-2a; 1942. Chest; Storage, Line-Throwing Gun. Shall be of but one type, grade, and size. Gives requirements for material, workmanship, general construction, size, assembly, hardware, welding, inspection, and tests, with detail drawing.

References.—Medicine Chests, *see* 915.43.

959. MISCELLANEOUS CONTAINERS

959.1 CANS

American Hospital Assn., 34-82. Ash and Garbage Corrugated Cans. Based on U. S. Gov., Federal Specification RR-C-81.

American Hospital Assn., 34-85. Foot-Operated Sanitary Waste Cans. Covers one type of sanitary waste can having an outer container, removable inner container, and a foot-operated hinged cover.

American Meat Institute. Standards for Packing House Supplies, Packs, and Equipment, 1928. Lard Cans. Includes round cans for domestic trade; 2-, 4-, and 8-lb. pails with friction slip covers, 45- to 120-lb. metal cans or drums; and square cans for export trade, requirements on dimensions, design, weight of tin-plate, gage of wire handles, and seam details.

Assn. of American Railroads, Freight Container Bureau. Bulletin 1-1926. Cans (Inside Containers) for Liquids, Semiliquids and Pastes. Recommended weight of tin plate; illustrated construction of seams and likely defects; leakage and drop tests.

Assn. of American Railroads, Purchases and Stores Div. Garbage and Refuse Can, 1934. Gives requirements as to dimensions and gage of galvanized sheet metal can and cover, with illustration showing details as to riveting, and handles.

Assn. of American Railroads, Purchases and Stores Div. Half Pint Squirt Can, 1934. Gives dimensional requirements and illustration for oil can with spring steel bottom.

Assn. of American Railroads, Purchases and Stores Div. Long Spout Valve Oiler and Tallow Pot, 1934. Covers one quart and three pint oilers, and five pint tallow pot (valve oil can); dimensional diagrams for painted sheet metal cans.

Assn. of American Railroads, Purchases and Stores Div. Oil Carriers, 1934. Gives dimensional requirements and illustrations for one, two, and five-gallon oil carriers made of sheet metal.

Assn. of American Railroads, Purchases and Stores Div. Soil Can, 1934. Covers Standard and alternate cheaper design, with dimensions, metal gage, and wire handle.

Assn. of American Railroads, Purchases and Stores Div. Two-Gallon Journal Oil Can, 1934. Gives dimensional requirements and illustration for long-spout galvanized iron oil can with wooden handle and interchangeable brass tips for summer use.

Underwriters' Laboratories, Inc. Standard for Design and Construction of Safety of Safety Cans, 1930. Covers the design and construction of safety cans to be employed for temporary storage and handling of flammable liquids such as gasoline, naphtha, etc., inside of buildings that are not provided with special storage rooms of proper construction. Materials, seams and joints, handles, spouts and fill fittings, valves, workmanship, marking, and tests.

U. S. Gov., Army Air Forces. Specification No.40469; 1942. Containers; Fuel, Water, or Oil, 7 1/2-Gallon Capacity.

U. S. Gov., Army Air Forces. Specification 40646 (1); 1944. Container; Fuel or Oil, Portable by Air, 5-Gallon Capacity.

U. S. Gov., Army-Navy Aeronautical Specification AN-W-5b-1; 1944. Water; Emergency Drinking, in Sealed Cans.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 78-1-S. Can; Kerosene, 1-Pint.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 78-2-S. Can, Kerosene, 1/2-Gallon.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 78-3-S. Can; Kerosene, 1-Gallon.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.79. Can; Back Pack, Water.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No.81. Can; Water, Horse or Truck Transporting.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification Nos.87 and 87.1. Carrier, Water Can, Horizental-Type and Vertical-Type, Animal Packing.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-80. Cans; Milk, 5- and 10-Gallon.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-83. Canteens; 1-, 2-, 4-, and 8-Quart.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R155-40; 1940. Cans for Fruits and Vegetables (Names and Dimensions). This recommendation establishes a schedule of stock sizes of cans for fruits and vegetables, and nomenclature applying to these cans. Sponsored by the National Canners Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R156-41; 1941. Extracted-Honey Packages. This recommendation establishes a schedule of sizes of containers for use in marketing stock packages of extracted honey. The recommended sizes are 2, 5, and 8 oz. and 1, 1 1/2, 2, 2 1/2, 3, 5, 10, and 60 lb. Sponsored by American Honey Producers League and American Honey Institute.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R164-36; 1936. Tinned Steel Ice Cream Cans. This recommendation establishes a schedule of stock types, sizes, and capacities of tinned steel ice cream cans of the high type and low (squat) type. Sponsored by International Assn. of Ice Cream Manufacturers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R170-38; 1938. Spice Containers (Tin and Fiber). This recommendation establishes a schedule of sizes of packages and capacities of containers for ground spices, except herbs. Initiated by the American Spice Trade Assn.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No.69. Cans; Milk, Steel.

U. S. Gov., Federal Specification RR-C-81; 1935. Amendment 1; 1936. Cans; Corrugated, Ash and Garbage. Covers the fabricated corrugated type and six capacities—5, 10, 17 1/2, 20 1/2, 25 1/2, and 33 gal. Gives requirements for material, workmanship, bodies, bottoms, covers, corrugations, coating, embossing, pails and cans; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification RR-C-83; 1941. Cans; Milk, Steel, Tinned. Covers one type and grade, in 5 and 10 gal. capacities. Gives requirements for black sheet steel, tin, workmanship, construction, thickness of sheet metal, tinning, cover, finish, handles, dimensions, and weights; method of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-RR-C-83; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for material, construction, and sizes.

U. S. Gov., Federal Specification RR-C-85; 1940. Cans; Oil (Kerosene). Covers two types—(I) capped spout and (II) faucet. In 1, 2, 3, and 5-gal. sizes. Zinc-coated (galvanized) sheet steel. Gives requirements for material, workmanship, fabrication, body, bottom, top, carrying bail, fill-opening fitting and cap, oil tightness, finish, dimensions, and thickness of sheet steel; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-C-87; 1938. Amendment 1; 1944. Cans; Oil, Typewriter. Covers one type, grade, and capacity, of steel, either galvanized, painted, or having a black oxide finish. Gives requirements for workmanship and details; methods of sampling and inspection; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-C-92; 1941. Amendment 1; 1944. Cans; Safety (for Gasoline, Naphtha, Etc.). Covers one type; two styles—(I) with short pouring nozzle and (II) with metal hose spout; and several sizes—ranging from 1 pt. to 10 gal. Gives requirements for material, workmanship, design, stability, pressure relief, valve operating ability, tightness of valve, joints and seams, tightness of joints and seams, gaskets, castings, finish, marking, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-C-94; 1939. Cans; Sprinkling. Covers one type; and six capacities—4, 6, 8, 10, 12, and 16 qt. Gives requirements for material, workmanship, body, bottom, top, spout, pouring nose, handles, zinc-coating, watertightness, thickness of sheet metal, and details; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-C-96a; 1942. Cans, Steel (Tinned-Plate, Terne-Plate, and Black Sheet); Friction-Covers. Covers one type, cylindrical; and six capacities—1/4 pt., 1/2 pt., 1 pt., 1 qt., 1/2 gal., and 1 gal. Gives requirements for materials, workmanship, cover, joints, top, closure, tightness of joints, tightness of cover, dimensions of cans, thickness of sheet, and bails; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-C-114; 1941. Amendment 1; 1944. Cans; Waste (Oily). Covers two types—(I) foot-operated and (II) hand-operated; and six capacities—6, 8, 10, 14, 21, and 30 gal. Gives requirements for material, workmanship, design, fabrication, dimensions, stability, oil tightness, finish, marking, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-C-121; 1941. Amendment 1; 1944. Cans; Waste, Sanitary, Foot-Operated. Covers one type of can having an outer container, removable inner container, and a hinged cover; five sizes—12, 14, 20, 28, and 40 qt.; and five colors—white, ivory, grained walnut, mahogany, and light green. Gives requirements for material, workmanship, construction, outer container, inner container, cover, lifting mechanism, finish, marking, and details; methods of inspection, sampling, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification RR-O-376; 1938. Amendment 1; 1944. Oilers and Fillers; Hand. Covers three types—(I) oilers, push-bottom, steel; (II) oilers, pump; and (III) fillers. Gives requirements for material, workmanship, finish, spouts, washers, marking, sizes, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No. 7. Contains requirements for fiber cans for shipment of lubricating oil. Published by American Trucking Assns., Inc., Tariff Bureau. National Motor Freight Classification No. 7-1943.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2A. Inside Containers—Metal Cans, Pails, and Kits. Includes requirements for capacity, thickness of metal, test, and closure. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2F. Inside Metal Containers and Liners. Includes requirements for gauge and sealing. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2G. Inside Containers—Fiber Cans and Boxes. Includes requirements for thicknesses and strengths. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles. Shipping Container Specification 2N. Inside Containers—Metal Cans. Covers requirements for material, manufacture, and test. Published by American Trucking Assns., Inc., Tariff Bureau, and by Assn. of American Railroads, Bureau of Explosives.

U. S. Gov., Interstate Commerce Commission. Regulations for Transportation of Explosives and Other Dangerous Articles by Motor, Rail, and Water. Shipping Container Specification MC200. Containers for Liquid Nitroglycerin. Covers requirements for motor vehicle body, inside containers, and boots. Published by American Trucking Assns., Inc., Tariff Bureau.

U. S. Gov., Joint Army-Navy Specification JAN-P-124; 1944. Packaging and Packing for Overseas Shipment—Cans and Pails; Metal.

U. S. Gov., Marine Corps Specification, 1942. Cans, One-Gallon; and Cases, Shipping; for Packing Ready-Mixed Paints.

U. S. Gov., Marine Corps Specification, 1942. Cans, One-Gallon; and Cases, Shipping; for Packing Shellac, Fire-Extinguishing Liquid, Paint Driers, Varnish, Oils, Disinfectant, Etc.

U. S. Gov., Marine Corps Specification, 1924. Oiler; Machinist, 3/4-Pint.

U. S. Gov., Navy Dept. Specification 42C10f; 1942. Cans; Cement.

U. S. Gov., Navy Dept. Specification 42C21b; 1941. Cans, Tin, 1-Quart, 1/2-gallon, 1-Gallon; Cases, Shipping.

U. S. Gov., Navy Dept. Specification 42 C 22d; 1943. Cans, 5-Gallon; and Cases, Shipping.

U. S. Gov., Navy Dept. Specification 42C28; 1944. Cans; Metal, for Export Shipment of Subsistence Items.

U. S. Gov., Navy Dept. Specification 56L9; 1944. Labeling and Marking of Metal Cans, for Subsistence Items.

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Cans.

U. S. Gov., Treasury Dept., Procurement Div., No. 421; 1940. Cans; Refuse, Nesting, Corrugated. Covers 10, 16, 24, and 32-gal. cans. Gives requirements for material, workmanship, body, bottom, handles, cover, reinforcing bands, zinc coating, water tightness, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-101-23A; 1926. Can; Antidim.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 42.2-11; 1921. Can; Galvanized Iron, 3-Gallon.

U. S. Gov., U. S. Army, Medical Dept. Specification 29-13; 1925. Tin; 5-Gallon, Alcohol, Export.

U. S. Gov., U. S. Army, Medical Dept. Specification 29-16; 1925. Can; 5-Gallon, Alcohol, Domestic.

U. S. Gov., U. S. Army, Medical Dept. Specification 29-83; 1939. Can; Waste.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 100-13A; 1943. Miscellaneous Lubricant Container and Packaging.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 28-18B; 1940. Can, Sponge, No.18A; Army Field Bake Oven, No. 1.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-91A; 1942. Can; Corrugated, Nesting, Galvanized, With Cover.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-10a; 1944. Cans and Pails; Ash and Garbage, With Covers, Galvanized. Shall be of the fabricated corrugated type with covers, and shall be two classes—(A) with verticle side wall and (B) with nestable side wall. Gives requirements for materials, workmanship, finish, watertightness, marking, sizes, thickness of metal, dimensions, tolerances, body, bottom, bands, cover, and handles; sampling, inspection, and methods of test; packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-G-165; 1936. Cans; Milk, Aluminum, Capacity 5 Gallons.

U. S. Gov., Veterans Administration. Specification VA-G-181; 1936. Cans; Milk, Aluminum, Capacity 3 Gallons.

U. S. Gov., Veterans Administration. Specification VA-G-195; 1936. Can; Milk, Aluminum, 2-Gallons Capacity.

U. S. Gov., Veterans Administration. Specification VA-G-228; 1936. Cans; Milk, Aluminum, Capacity 1 Gallon.

U. S. Gov., Veterans Administration. Specification VA-G-242; 1936. Cans; Milk, Aluminum, Capacity 10-Gallons.

U. S. Gov., Veterans Administration. Specification VA-G-243; 1936. Cans; Milk, Aluminum, Capacity 8 Gallons.

U. S. Gov., Veterans Administration. Specification VA-G-244; 1936. Cans; Milk, Aluminum, Capacity 2 Quarts.

U. S. Gov., Veterans Administration. Specification VA-G-246; 1936. Cans; Milk, Aluminum, Capacity 5 Gallons, With Bail Handle.

U. S. Gov., Veterans Administration. Specification VA-M-230b; 1941. Oilers; Steel.

References.—Iron and steel sheets, *see* 604.2; methods of testing and general requirements for metals, *see* 600.1; zinc and tin coatings and methods of testing, *see* 600.3; fiberboard, methods of testing fiberboard, *see* 472.93, 470.3.

959.2 TANK CARS

References.—Tank cars, automobile truck tanks, *see* 726.1, 722.1.

959.3 CASKETS AND CASKET BOXES

American Concrete Institute. Tentative Specification for Concrete Burial Vaults, 709-32-T; 1932. These specifications shall apply to reinforced concrete burial vaults. Gives requirements for materials, design, workmanship and finish, markings, physical tests, sealing, and inspection together with illustration. Endorsed by the National Concrete Burial Vault Assn.

U. S. Gov., Federal Specification NN-C-121; 1939. Caskets (Burial) and Outside Boxes. Covers two types of caskets—(I), hinged-cap, (II) dowel-cap; one type of outside-boxes—(III); and two classes of caskets—(A) wooden, and (B) metal-lined. Gives requirements for material, workmanship, wood, glue, design, covering, upholstery, linings, pillow, handles, construction, dimensions; methods of inspection and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 57C6; 1939. Caskets; Shipping, Metal.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Caskets; Burial, All Metal, for Shipping, 1941.

U. S. Gov., Veterans Administration. Medical and Hospital Supply Section, VA-H-60g; 1943. Caskets and Outside Burial Boxes.

959.4 REFRIGERATORS

American Society of Refrigerating Engineers and U. S. Dept. of Agriculture, Bureau of Human Nutrition and Home Economics, sponsors. American Standards Assn., B38-1-1944. Food-Storage Volume and Shelf Area of Automatic Household Refrigerators. Covers scope and purpose, inside dimensions, food-storage volume determination, shelf-area determination, and data to be reported.

American Society of Refrigerating Engineers and U. S. Dept. of Agriculture, Bureau of Human Nutrition and Home Economics, sponsors. American Standards Assn., B38.2-1944. Household Electric Refrigerators (Mechanically Operated). Covers scope and purpose, general requirements, no-load test, ice-making test, accuracy, and table showing sample summary sheet for test results.

National Assn. of Ice Refrigerator Manufacturers. Approved also by National Assn. of Ice Industries. Minimum Construction Requirements for Ice Refrigerators Designed To Carry the Seal of Approval. Covers requirements for exteriors where applied over framework, framework, exteriors without framework, interiors, insulation, gaskets, locks and hinges, shelves, drainage systems, finish, and air conditioning principle.

National Electrical Manufacturers Assn. Household Electric Refrigerator Standards, 42-79; 1942. Provides a uniform method of determining the food storage volume and shelf area and a uniform procedure for determining the performance of mechanically operated household refrigerators. Gives inside dimensions, food storage volume, shelf area, and data to be reported; and test conditions, internal cabinet temperatures, no-load tests, and ice-making test.

Underwriters' Laboratories, Inc. Standard for Unit Refrigerating Systems. Covers two systems classified as—class D, containing more than 6 lb. but not more than 20 lb. of refrigerant; and class E, containing 6 lb. or less of refrigerant. Design and construction, examination and test, and inspection of listed product.

U. S. Gov., Army Air Forces. Specification No.40820; 1944. Refrigerator; Portable by Air, Type A-1, 50-Cubic Foot, Reach-In, Knock-Down.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R96-28; 1928. Ice Cake Sizes. This recommendation establishes weights and dimensions of ice cakes for domestic refrigerators, namely—25, 50, 75, 100, and 150 lb. Sponsored by the National Assn. of Ice Industries and American Society of Refrigerating Engineers.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R109-29; 1929. Refrigerator Ice Compartments. This recommendation covers capacities and dimensions of ice compartments for two types of domestic refrigerators known as side icers and front icers. Sponsored by American Institute of Refrigeration and National Assn. of Ice Industries.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 4. Refrigerators; Gas Operated.

U. S. Gov., Dept. of Interior, Purchasing Office. Standard Specification No. 5. Refrigerators; Kerosene Operated.

U. S. Gov., Federal Specification AA-R-211a; 1941. Refrigerators; Electric, Portable. Covers self-contained, air-cooled units, in two classes—(1) open and (2) sealed. Gives requirements as to sizes and capacities, and construction; methods of sampling, inspection, and tests; and requirements for packaging and marking for shipment.

U. S. Gov., Navy Dept. Specification 26R1a; 1944. Refrigerators; Electric, Portable, for Shipboard Installation.

U. S. Gov., Navy Dept., Bureau of Yards and Docks. Specification 16Ye; 1941. Refrigerating Equipment. Includes requirements for built-in refrigerators and display cases. Also includes ice-making equipment.

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Refrigerators, 1943. Commercial reach-in type, capacity not less than 45 cu. ft.

U. S. Gov., Treasury Dept., Procurement Div., No. 282; 1938. Refrigerators; Electric, Dry and Wet Storage. Shall be of one type having a water containing compartment or compartments with top cover or covers and a dry storage compartment with a hinged door on the front face. Gives requirements for sizes, wet storage compartment, dry storage compartment, door, shelves, cabinet insulation, hardware, refrigerating mechanism, refrigerant, and electrical equipment; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 22-177; 1929. Ice.

U. S. Gov., Veterans Administration. Specification VA-M-121b; 1938. Automatic Electric Refrigerators.

U. S. Gov., Veterans Administration. Specification VA-GC-113c; 1942. Utility Room Refrigerators.

U. S. Gov., Veterans Administration. Specification VA-MC-197e; 1942. Electric Mortuary Refrigerators.

959.5 SPECIAL CONTAINERS

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Outfits; Water, Back Pack, Air-Pressure Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 92. Carriers; Back Pack Outfit, for Automobiles.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 95. Case; Smoke, Chaser Map.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 251-1. Outfit; Camp-Boss, Metal Container, Large.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 251-2. Outfit; Camp-Boss, Metal Container, Small.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 251-3. Outfit; Camp-Boss, Canvas, Roll-Up Container.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-10. Outfit Container; 2-, 3-, and 6-Man Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-11. Outfit Container; 10-Man Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-12. Outfit Container; 25- and 50-Man Nested Mess.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-247-18. Box; Knife and Fork, 25- and 50-Man Size.

U. S. Gov., Navy Dept. Specification 42C13a; 1925. Containers; Soda Lime, for Submarines.

U. S. Gov., Navy Dept. Specification 57C12; 1941. Containers; Tin, Combat-Dressing.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 50-11-85; 1933. Cup; Closing, for Blank Ammunition.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-651A; 1937. Carrier; Type RL-24-A, Wire Pack.

U. S. Gov., U. S. Army, Signal Corps. Specification 71-664; 1933. Carrier, Type FM-11; and Frame, Type FM-12; Pack Load Accessories.

959.6 WRAPPINGS AND COVERINGS

American Iron and Steel Institute. Steel Products Manual, Section 9a; 1943. Standard packaging and Shipping Methods of Cold-Finished Bars. General provisions, packaging, boxing, paper or burlap wrapping, wrapping or shrouding, and identification.

Society of Automotive Engineers. Aeronautical Standard 6A; 1944. Enclosure; Storage and Shipping; Aircraft Engine. To provide general information relative to construction and application of a moisture-resistant envelope for enclosing an aircraft engine preparatory to shipment and/or storage. Covers material and accessories, construction, marking, packing, and drawings.

U. S. Gov., Army Air Forces. Specification 17018 (1); 1943. Envelopes; Equipment Preservation, Moisture-Impervious.

U. S. Gov., Army-Navy Aeronautical Specification AN-E-1a-1; 1943. Envelope; Moisture-Impervious.

U. S. Gov., Army-Navy Aeronautical Specification AN-P-54-1; 1945. Plastic Film; Transparent, Moisture-Impervious.

U. S. Gov., Interstate Commerce Commission. National Motor Freight Classification No. 7. Contains requirements for wrapping for shipment of automobile and tractor fenders, canoes, wooden telephone booths, glass blocks, glass bricks, built up wood covered with iron or steel, rods, sheets, or tubes of pyroxylin or other plastic, aluminum foil, rugs, honey, furniture, lawn mowers, shafting and shafts, carbonized print paper, and paper cards. Published by American Trucking Assns., Inc., Tarriff Bureau. National Motor Freight Classification No. 7-1943.

References.—Lined boxboard, corrugated boxboard fiberboard. *see* 472.16, 472.23, 472.93; wrapping paper, *see* 477; gummed paper, *see* 479.2; methods of testing fiberboard and paper, *see* 470.3.

959.7 DUMP AND STORAGE BINS AND HOPPERS

U. S. Gov., Navy Dept. Specification 26B5; 1942. Bins; Rotary, for Storage Purposes Aboard Ship.

References.—Dump, blending, and storage bins for bakeries, *see* 786.

959.8 LIQUID AND DRY MEASURES

Assn. of American Railroads, Purchases and Stores Div. One-Quart Graduated and One-Gallon Measures, 1934. Gives general form for liquid measures with handle and lip, conforming to Simplified Practice Recommendation No. 55 of the National Bureau of Standards, U. S. Dept. of Commerce.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Dry Capacity Measures. Shall be made of metal, well-dried wood, or composition, or similar or suitable material. Detail requirements are given concerning design, construction, materials, and allowable tolerances.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H29; 1942. Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices. Liquid Capacity Measures. Shall be made of metal, glass, earthenware, enameled ware, composition, or similar and suitable material. Specification requirements are given relative to construction and capacities of measures, as well as allowable tolerances.

U. S. Gov., Navy Dept. Specification 41M6a; 1943. Measures; Copper.

U. S. Gov., Treasury Dept., Procurement Div., 455A; 1942. Measures; Liquid, Lipped. Covers two types—(A) copper (tinned on inside surface) and (B) iron or steel (tinned on both surfaces). Gives requirements for marking, tightness, finish, body, handle, metal thickness, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 28-71; 1939. Measure; Liquid, 1-Quart, Copper.

References.—Liquid measures, dry measures, *see* 919.1.

959.9 CONTAINERS NOT ELSEWHERE CLASSIFIED

American Society for Testing Materials, D760-44T; 1944. Tentative Specifications for Enclosures for Small Testing Machines for Tests at Subnormal and Supernormal Temperatures of Electrical Insulating Materials and Plastics. Gives scope, requirements, and materials of construction.

Assn. of Lift Truck and Portable Elevator Manufacturers. Specifications for Skid Platforms. Includes capacities, underclearance (for shipping use Simplified Practice Recommendation of U. S. Dept. of Commerce R95-30), width, length, thickness of top boards, angles and legs, four-way entry, etc.

National Board of Fire Underwriters. Containers for Storing and Handling Flammable Liquids, No. 30; 1941. Standards apply to three classes of flammable liquids—(I) flashpoint below 25° F., (II) flashpoint above class I and below 70° F., and (III) flashpoint above class II and below 200° F. Gives introduction, individual underground storage systems without inside discharge, inside discharge systems, portable tanks, stationary tanks in buildings, storage in drums or other sealed portable containers, above ground storage, concrete fuel oil storage tanks, and tanks in flood regions.

U. S. Gov., Army Air Forces. Specification No. 40442; 1942. Container; Aerial Delivery, Type A-7, Sling Assembly Ammunition Box.

U. S. Gov., Army Air Forces. Specification No. 40483; 1943. Container; Aerial Delivery, Type A-10.

U. S. Gov., Army-Navy Aeronautical Specification AN-C-67a-1; 1944. Containers; Moisture-Impervious, General Features of Construction.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R95-30; 1930. Skid Platforms. Establishes clearance and over-all dimensions of skid platforms.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R193-42; 1942. Packages for Shortening, Salad Oil, and Cooking Oil. This recommendation gives tables showing sizes of packages and number of packages per case for both shortening packages and for salad and cooking oil packages. The types of containers are not specified because of uncertainty regarding availability of material. Sponsored by the Institute of Shortening Manufacturers, Inc.

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures, (for) Land Use. Includes requirements for cabinets for folded paper towls. Requirements given for door frame, hinges, dispensing slot, finish, and lock; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, and illustrations; selections and air gaps.

U. S. Gov., Marine Corps Specification, 1943. Carrier; Vacuum, for Food and Liquids.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-40451; 1944. Container; Message, Type A-8, Illuminated.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2484A; 1940. Container; Hard Rubber or Plastic.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2641; 1939. Container; Ink, Meat Inspection.

References.—Box shook and crating, *see* 421.4; nails, see 608.1; grading rules for box lumber, *see* 413.9; sterilizers, *see* 915.32; soap kettles, *see* 787; envelopes, *see* 494.

970-979 FIRE EXTINGUISHING APPARATUS AND SUPPLIES

970. GENERAL ITEMS

American Bureau of Shipping. Rules for the Classification and Construction of Steel Vessels, 1942. Include requirements for fire protection—general, fire pump systems, steam smothering systems, smothering systems, and portable extinguishers; and special requirements for oil burning vessels, and motor vessels.

American Mining Congress, American Standards Assn., M17-1930. Fire Fighting Equipment in Metal Mines. Recommendations on type and size of hose and water supply systems for surface and for underground fire fighting equipment; equipment of extinguishers, fire pails, sprinkling systems, oxygen breathing apparatus; recommendations on ventilation, handling explosives, signals, etc.

American Transit Assn. Recommended Rules for Instruction to Employees for Fire Protection, W133-23; 1923. Fire protection rules when adopted by the association to conform to corresponding regulations of the National Fire Protection Assn.

Associated Factory Mutual Fire Insurance Companies. Pamphlet 77; 1937. Fire Extinguishers. Gives general information, fire pails, water barrels and bucket tanks, pump tanks, gas-cartridge type water-filled extinguishers, small hose, soda-acid extinguishers, nonfreezing extinguishers, foam extinguishers, vaporizing liquid extinguishers, carbon dioxide extinguishers, dry-chemical extinguishers, sand, sawdust, salt, soda and talc, fire rating guide for approved extinguishers, and extinguisher characteristics.

National Board of Fire Underwriters. Code of Suggested Ordinances for Small Municipalities, 1943. Gives details for a suggested ordinance providing for fire limits, and the construction and equipment of buildings, and a suggested ordinance providing for fire prevention and protection in connection with hazardous materials and processes.

National Board of Fire Underwriters. First-Aid Fire Appliances, No.10; 1938. Regulations governing equipment for three classes of fires, list of appliances, method of operation, distribution of units, maintenance, including fire pails, foam pails, soda-acid foam, pump tank, calcium chloride, and special tetrachloride fire extinguishers, sand pails, soda, and sawdust.

National Board of Fire Underwriters. Standpipe and Hose Systems, No.14; 1938. Regulations for installation inside buildings, for use of trained firemen, and use of building occupants. Covers water and dry standpipe, minimum sizes for various heights of buildings, location of hose stations, water supply, connections, valves, and fittings; tests and maintenance.

National Board of Fire Underwriters. Outside Protection, No.24; 1931. Regulations for private underground piping systems supplying water for fire extinguishment. Types of valves and locations, type, number, location, and setting of hydrants; standard monitor nozzles and application, size and weight of pipe, and layout of piping systems; rules for laying of pipe; and testing.

National Board of Fire Underwriters. Private Fire Brigades, No.27; 1937. Includes suggestions for organization, drilling, and equipment of private fire brigades.

National Board of Fire Underwriters. National Electrical Code, 1940. American Standards Assn., C1-1940. Link Fuses. Allowable capacities, construction of tips, rating, clearances required, approved applications.

National Board of Fire Underwriters. Suggested Fire Prevention Ordinance, 1943. Covers bureau of fire prevention and general provisions, explosives, pyrotechnics and small arms ammunition, nitro-cellulose motion picture film, pyroxylin plastic, photographic and X-ray nitro-cellulose film, calcium carbide and acetylene, compressed and liquefied gases, other than acetylene, flammable liquids, application of flammable finishes, dry cleaning and dry dyeing, prevention of dust explosions, hazardous chemicals, combustible fibres, refrigeration, matches, automobile garages and automobile repair shops, fire exits, fire extinguishing equipment, gas appliances and connections, miscellaneous, tire rebuilding plants, automobile wrecking and junk yard, woodworking plants, and penalties for violation.

National Board of Fire Underwriters. Suggested Ordinance Providing for Safety to Life in Places of Assembly, 1943. Covers application of ordinance, decorative materials, aisles, exits defined, basis for determining exits, exit doorways, exit ways, exit doors, marking of exits, lighting of exits, use of exits, stairways, ash trays, fire appliances, inspection by fire department, and placard indicating capacity.

National Board of Fire Underwriters. Suggested Specifications on Municipal Fire Apparatus, 1941. Requirements for gasoline engine-driven apparatus, including construction, rating of pumps, power requirements of engine, storage batteries, tires, fuel capacity, body construction, auxiliary equipment, and tests. Includes basic equipment for triple combination pumper, ladder truck (city service), ladder truck (aerial), ladder truck pumper (quadruple combination), and lists extra tools and appliances for pumpers and ladder trucks.

National Fire Protection Assn. Industrial Fire Brigades Training Manual, 1943. This report embodies the best material available and the basic fire fighting practices are well standardized and agreed upon. Covers the industrial fire brigade, forcible entry practices, rope work, fire extinguisher practices, ladder practices, hose practices, salvage and overhaul practices, fire streams, ventilation practices, periodic inspections of plant fire protection equipment, care of fire brigade equipment, fire causes and fire hazards, fire fighting procedure, flammable liquid and gas fires and special extinguishing systems, electrical fires, and gas masks and rescue practices.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Community Forest Fire Fighting Equipment. Covers the forest and brush fire problem, hand pumps, power pumps, motorized forest fire truck, hose, hand tools, housing and care of equipment, and availability of parts.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Control of Water Waste From Private Fire Protective Equipment. Covers introduction, waste of water in fire fighting operations, waste from broken pipes and abandoned hydrants, restriction of size of connections, loss of water under normal conditions, and conclusions and recommendations.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Fire Fighting Equipment in Metal Mines. Recommended practice for fire fighting equipment, preventative measures, fire signals, and fire fighting personnel in metal mines. Covers water and water supply equipment, fire extinguishers, fire pails and sprinkling systems, oxygen breathing apparatus, ventilation and ventilation equipment, explosives, electrical equipment, fire signals, fire fighting personnel, and miscellaneous measures.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. First Aid Fire Appliances. Standards for the installation, maintenance, and use of first aid fire appliances. Covers general requirements, classification of first aid fire appliances, distribution of units, plan governing the arrangement of the standards, standard fire pails, chemical solution extinguishers, water type extinguishers, antifreeze solution extinguishers, hand hose, foam extinguishers, loaded steam extinguishers, vaporizing liquid extinguishers, carbon dioxide extinguishers, dry compound extinguishers, sand fire pails, soda and sawdust, and enclosures for protecting chemical extinguishers against freezing.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Marine Fire Protection. Fire protection regulations for motor craft. Fires and extinguishers divided into three classes—(A) in ordinary combustible material (quenching and cooling), (B) in flammable liquids (blanketing, direct smothering), and (C) in electrical equipment (nonconducting). Gives details concerning properties of fire extinguishers, installation and upkeep, recommended hand extinguisher equipment, and smothering systems.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Outside Protection. Standards for outside protection. Private underground piping systems supplying water for fire extinguishment. Covers general information, water supplies, valves, hydrants, heavy caliber hose streams, underground pipe and fittings, rules for laying pipe, and testing.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Private Fire Brigades. Suggestions for the organization, drilling, and equipment of private fire brigades. Covers responsibility of the management, cooperation with public fire departments, fire brigade organization, fire alarm, drills, fire methods, procedure after fire, maintenance, inspections, and equipment.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Protection of Electric Cars, Trolley Buses, Houses, and Yards. Gives requirements for construction, maintenance, and protection of car and trolley bus houses and yards.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Protection of Piers and Wharves. Includes subdivision of combustible substructures, protection of combustible substructures, fire protection, first aid fire appliances, watch service, fire alarm, and fire brigade.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Recommendations for Uniform Marking of Fire Hydrants. Covers three classes—(A) flow capacity of 1,000 g.p.m. or greater, (B) flow capacity of 500-1,000 g.p.m., and (C) flow capacity of less than 500 g.p.m. Class (A) tops and nozzle caps—green, class (B) tops and nozzle caps—orange, and class (C) tops and nozzle caps—red. All barrels to be chrome yellow. Also covers private hydrants.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Standpipe and Hose Systems. Standards for the installation of standpipe and hose systems. Covers general information, size and strength of standpipes, number and location of standpipes, hose stations, water supplies, connections, valves and fittings, tests and maintenance, and appendix.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Steam Extinguishing Systems. With the development of other types of special extinguishing systems, steam is no longer recognized in N.F.P.A. standards except for the protection of ovens and similar high temperature enclosures. Covers steam jets and gives details for this system.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Volunteer Fire Departments. Covers housing, motorized apparatus, hose and other equipment, maintenance, organization and personnel, duties, alarms, drills, public service, model ordinance, rules and regulations for administration, and model law establishing fire protection districts and providing fire protection.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Watchman. Covers a position of trust, get the right man, support him fully, instruct him fully, the watchman must know, the watchmen's route, time recording apparatus, time records, rounds, the watchman's duty, night watch, day watch, and number of watchmen required.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Water Charges. The relation of private fire protective equipment to municipal and privately operated water works with special reference to water charges. Covers the encouragement of automatic sprinkler installations, public fire protection—a governmental function, charges for private fire protection, present practice regarding charges, and conclusions and summary.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Water Systems for Fire Protection on Farms. Effective fire fighting at rural fires depends to a large extent upon the facilities provided by individual property owners. Covers general requirements, gravity systems, wells, pressure systems, fire fighting equipment, water supplies for fire department use, private fire pump, and conclusions.

Underwriters' Laboratories, Inc. Bulletin of Research, 28; 1943. Fire Exposure Tests of Fire Windows. This bulletin records fire exposure and hose stream tests on window frame and wired glass assemblies of five different types. These assemblies are representative of those investigated with a view to establishing their acceptability as fire barriers of the class. Covers test program, test assemblies, record of fire tests, summary, and remarks.

Underwriters' Laboratories, Inc. Bulletin of Research, 29; 1943. Classification of the Hazards of Liquids. Covers hazardous properties of liquids, volatility, ignition temperature, flammable limits, combustion intensity, hazards by combination, vapor density, nature of products of combustion, toxicity, and chemical stability; relation of hazardous properties to fire hazard, field criteria, mathematical probability, inherent hazard, fundamental physico-chemical data, flash point, and hazard scale; and classification of the hazards of liquids.

Underwriters Laboratories, Inc. Demonstration Lecture on Extinguishing Flame. Covers combustion, three ways to extinguish flame, cooling, the kitchen method, ignition without flame or spark, H_2O plentiful and effective, effect of water spray, dilution—not practical, types of extinguishers using water, vaporizing liquid, dry compound, foam, carbon dioxide, and sound waves.

Underwriters' Laboratories, Inc., 1945. List of Inspected Fire Protection Equipment and Materials. This catalog lists appliances and materials which have been inspected by the Underwriters' primarily with reference to fire preventive and fire protective capabilities, and to such fire hazards and accident hazards as are involved in the groups in which they are listed. There is an index and the items are arranged alphabetically as to the subject and alphabetically by name of manufacturer under each subject.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-415. Auto-Release Fire Extinguishing System, for Pacific Islands.

References.—Fire cars for railroad yards, *see* 726.1.

970.1 ARRESTERS, SPARK

Underwriters' Laboratories, Inc. Marine Backfire Flame Arresters, 1931. Tentative. For use in carburetor air intakes, construction details, width of joints, corrosion resistance, vibration, and explosion tests.

Underwriters' Laboratories, Inc. Standard for Flame Arresters for Use in Open Vent Pipes of Oil Storage Tanks, 1936. For use alone or combined with vent valves, noncorrosive metal device, encased in a substantial shell. Explosion, continuous flame, and flow capacity test requirements.

971. MOTOR FIRE APPARATUS

References.—Automobile fire apparatus, *see* 722.2; stationary fire pumps, *see* 755.1; fire-fighting equipment for rural fire departments, *see* 970.

972. HAND-DRAWN FIRE APPARATUS

973. CHEMICAL FIRE EXTINGUISHERS

973.1 CHEMICAL ENGINES

References.—Methods of testing tin, lead, and zinc coatings, *see* 600.3.

973.2 HAND CHEMICAL FIRE EXTINGUISHERS

American Hospital Assn., 22-1. Carbon-Tetrachloride Type, Hand Chemical Fire Extinguishers. Covers one grade. Based on U. S. Gov. Federal Specifications O-F-351.

American Hospital Assn., 22-4. Hand (Soda-and-Acid Type) Chemical Fire Extinguishers. Covers one grade. Based on U. S. Gov. Federal Specification O-F-355a.

American Hospital Assn., 22-7. Foam-Type Portable Hand Fire Extinguishers. Covers one grade. Based on U. S. Gov. Federal Specification O-F-361.

Underwriters' Laboratories, Inc. Standard for Construction of 1 1/4 and 1 1/2-Gallon Foam Extinguishers, 1929. For use in accordance with requirements of the National Board of Fire Underwriters. Capacity, thickness, and strength of copper shell; requirements for design of shell, collar, cap, solution container, etc.; composition of chemical charge, durability of and volume of foam, and distance and extinguishing tests.

Underwriters' Laboratories, Inc. Standard for Construction of 1 1/4 and 1 1/2-Gallon Soda Acid Extinguishers, 1929. To be used in accordance with regulations of the National Board of Fire Underwriters. Gives shell capacities, thickness and strength of copper shell, design requirements for shell, cap, handle, screen, glass bottle, and hose; composition of chemical charge, finish and labeling.

Underwriters' Laboratories, Inc. Standard for 2 1/2 Gallon Foam Extinguishers, 1939. For use in accordance with regulations of the National Board of Fire Underwriters. Gives requirements for construction of copper shell, collar, cap, gasket, screen, coating, capacity, solution container, etc. Includes composition of chemical charge, hydrostatic test, operation, and labeling.

Underwriters' Laboratories, Inc. Standard for 2 1/2 Gallon Loose Stopple Soda-Acid Extinguishers, 1939. To be used in accordance with regulations of the National Board of Fire Underwriters. Gives requirements for construction of copper shell, cap, screen, hose, acid bottle, etc. Includes chemical charge, tests, operation, and marking.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-272. Fire Extinguisher System; Carbon Dioxide.

U. S. Gov., Dept. of Commerce, Civil Aeronautics Administration, Bureau of Federal Airways. Specification CAA-495. Fire Extinguishing System, for Alaska Building; Carbon Dioxide.

U. S. Gov., Federal Specification O-F-351; 1931. Fire Extinguishers; Chemical, Hand, Carbon-Tetrachloride Type. Covers one grade. Gives requirements for type, construction, performance, extinguishing liquid, and labeling and marking; method of test; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification O-F-355a; 1934. Fire Extinguishers; Chemical, Hand (Soda and Acid Type). Covers one grade. Gives requirements for type, performance, labeling and marking, strength, protection and corrosion, chemical charge, and bracket; detail requirements for capacity, shell, collar, cap, outlet, acid-bottle cage, acid bottle, stopple, nozzle, hose, and handles; method of tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification O-F-361; 1938. Amendment 1; 1938. Fire Extinguishers; Hand, Portable, Foam Type. Covers one grade. Gives requirements for type, performance, strength, safety release device, protection against corrosion, labeling and marking, chemical charge, and bracket; detail requirements for capacity, shell, collar, cap, safety release device, outlet, inner container, stopple, nozzle, hose, and handles; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification O-F-367; 1944. Fire Extinguishers; Hand, Portable, Pump-Tank Type. Covers one type and one grade. Gives requirements for material, type, performance, protection against corrosion, finish, antifreeze chemical charge, labeling and marking, bracket, and details including capacity, tank, pump, hose, nozzle, handles, and foothold; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Treasury Dept., Procurement Div., 212D; 1941. Fire Extinguishers; Hand, Portable, Gas-Expelled Liquid Type (commonly known as "Water-Unit," "Anti-Freeze Unit," Etc.). Shall be of one type. Gives requirements for metallic parts, capacity, finish, bracket, shell, collar, cap, outlet, assembly, hose, nozzle, handles, performance, and strength; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-2-H; 1941. Extinguisher; Aircraft, Fire, Type A-2.

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-12; 1939. Extinguisher; Aircraft, Fire, CO_2, Type A-14.

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-13; 1940. Extinguisher; Fire, Aircraft, CO_2, Type A-15.

References.—Protective coatings and methods of testing, *see* 600.3; chemical charges, *see* 973.3; hose for extinguishers, *see* 202.21.

973.3 CHEMICAL CHARGES FOR FIRE EXTINGUISHERS

American Hospital Assn., 22-10. Carbon-Tetrachloride Base Fire Extinguishing Liquid. Covers one grade. Based on U. S. Gov. Federal Specifications O-F-380.

Underwriters' Laboratories, Inc. Standard for Extinguishing Liquids for Hand Fire Extinguishers, One-Quart Capacity, Pump and Pressure Types. Requirements for tests for specific gravity, cold test, distillation, water, acid, chloride, carbon disulphide, and impurities.

U. S. Gov., Federal Specification O-F-380a; 1930. Fire Extinguishing Liquid; Carbon-Tetrachloride Base. Covers one grade and two types—(I) regular and (II) colored. Gives requirements for stain test, color, appearance, specific gravity, cold test, distillation range, and impurities; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 51C25a; 1941. Charges; Fire Extinguisher, Foam Type.

U. S. Gov., Treasury Dept., Procurement Div., No.637; 1943. Charges; Fire Extinguisher, Foam Type, for 2 1/2-Gallon Capacity. Covers one type and one grade. Charges shall be in dry form and shall consist of two separate units. Gives chemical requirements for each charge; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Chemical charges for hand fire extinguishers, *see* 973.2; carbon tetrachloride, *see* 839.7; sulphuric acid, *see* 821.7; methods of testing and general requirements for metals, *see* 600.1.

973.4 CARBON DIOXIDE FIRE EXTINGUISHING SYSTEMS

National Board of Fire Underwriters. Carbon Dioxide Fire Extinguishing Systems and Inert Gas for Fire and Explosion Prevention, No.12; 1942. Covers the standard methods of fire protection involving the use of carbon dioxide for the protection of fire hazards which are of such a nature that this form of protection is suitable. Does not include hand fire extinguishers or the protection of airplanes and power boats. Gives general rules covering all systems, equipment for protection by the total flooding of enclosed spaces, equipment for the protection by local application of gas on particular hazards, equipment designed to give protection where both an immediate and an extended or secondary discharge of gas are required, systems protecting electrical apparatus, and discusses the use of inert gases which when mixed with air reduce the oxygen percentage of the atmosphere below the combustion limit.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Carbon Dioxide Fire Extinguishing Systems. Standards for carbon dioxide fire extinguishing systems. Gives general rules covering all systems, equipments for protection by the total flooding of enclosed spaces, equipments for protection by local application of gas on particular hazards, equipments where both an immediate and a delayed secondary discharge of gas are required for protection, and additional requirements for electrical apparatus.

Underwriters' Laboratories, Inc. Bulletin of Research, 26; 1942. Electrical Conductivity of Snow and Gas Discharge from First Aid Carbon Dioxide Extinguishers. This bulletin describes the electrical conductivity gas and snow discharged from carbon dioxide extinguishers of the first aid type, when fighting fires in or adjacent to high-voltage electrical equipment. Covers plan of investigation, description of test assemblies, record of tests, summary of test results, conclusions, and recommendations.

U. S. Gov., Army Air Forces. Specification 40459 (1); 1943. Extinguisher; Fire, CO_2, Aircraft, Four-Discharge Line, Type A-18.

U. S. Gov., Army Air Forces. Specification 40690-1; 1944. Extinguisher; Aircraft, Fire, Fixed Installation.

U. S. Gov., Treasury Dept., Procurement Div., 207B; 1942. Fire Extinguishers; Portable. Carbon Dioxide (Hand and Wheeled Types). Covers two types—(I) hand (five classes) and (II) wheeled (three classes). Gives requirements for material and workmanship, cylinders, discharge valves, discharge hose, discharge fitting; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No.242; 1936. Extinguishers; Fire, Portable, Carbon Dioxide, Small. Shall be designed for at least 97 percent discharge without freezing. Gives requirements for weight, capacity, cylinders, discharge valves, discharge fittings, and wall holders; method of sampling, inspection, and tests; packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-8A; 1942. Extinguisher; Fire, Carbon Dioxide.

Aircraft, Fixed Installation, General Specification.

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-9; 1937. Extinguisher; Fire, Carbon Dioxide, Aircraft, Single-Discharge Line, Type A-11.

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-10; 1937. Extinguisher; Fire, Carbon Dioxide, Aircraft, Two-Discharge Line, Type A-12.

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-11; 1937. Extinguisher; Fire, Carbon Dioxide, Aircraft, Three-Discharge Line, Type A-13,

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-14; 1942. Extinguisher; Fire, Portable, Carbon Dioxide.

U. S. Gov., U. S. Army, Army Air Forces. Specification 85-15; 1942. Extinguisher; Fire, Aircraft, Carbon Dioxide, Type A-17.

973.5 FOAM EXTINGUISHER SYSTEMS

National Board of Fire Underwriters. Foam Extinguisher Systems, No. 11; 1942. These rules indicate the standard method of fire protection by the use of foam for flammable liquids stored and used in processes in industrial plants, and they also include automatic foam extinguishing systems designed to protect other hazards. Covers general rules covering all systems, outdoor foam extinguishing systems, systems for rooms and buildings with hazards not susceptible to ordinary automatic sprinkler protection, and systems for local inside hazards in rooms or buildings having other standard fire protection.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Foam Extinguishing Systems. Standards for foam extinguishing systems. Gives rules covering all systems, outdoor foam extinguishing systems, systems for rooms and buildings with hazards not susceptible to ordinary automatic sprinkler protection, and systems for local inside hazards in rooms or buildings having other standard fire protection.

974. FIRE HOSE AND FITTINGS

974.0 GENERAL ITEMS

American Society of Mechanical Engineers. American Standards Assn., B33.1-1935. Hose Coupling Screw Threads. For all connections having nominal inside diameters of 1/2, 5/8, 3/4, 1, 1 1/4, 1 1/2, and 2, in.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 24.10; 1940. Fire Hose—Care and Maintenance. Gives suggestions for keeping cotton rubber-lined hose and linen hose in good condition. Also details concerning cotton rubber-lined hose including tearing hose, cleaning hose, and drying hose; and details concerning linen hose.

National Board of Fire Underwriters. Standard for Fire-Hose Coupling Screw Thread, 1925. National (American) standard covers the threaded part of fire-hose couplings, hydrant outlets, and standpipe connections. Includes tables of limiting dimensions of external and internal threads and of plug and ring gages for field inspection of 2 1/2-, 3-, 3 1/2-, and 4 1/2-in. hose sizes. American Standards Assn., B26; 1925. Prepared by Joint committee of the American Society of Mechanical Engineers, American Water Works Assn., and National Board of Fire Underwriters.

National Board of Fire Underwriters. Water Spray and Extinguishing Systems, No. 15; 1941. Standards for the two methods of applying water spray which are by the use of hose lines and by the use of fixed systems of piping. Covers general requirements, manually operated portable hose and spray nozzles, fixed nozzle systems, and maintenance.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Standard Threads for Fire Hose Couplings. Characteristics of national standard fire hose coupling thread. Gives drawings and tables showing dimensions.

Society of Automotive Engineers and American Society of Mechanical Engineers. American Standards Assn., B2-1919. Pipe Threads. Similar to corresponding portion of U. S. Gov., Dept. of Commerce, National Bureau of Standards Handbook H28, Screw-Thread Standards for Federal Services.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Handbook H28; 1944. Screw-Thread Standards for Federal Services. Presents complete dimensional data upon which specifications may be based for threaded products for government requirements. Includes terminology (definitions and symbols); American National hose-coupling and fire-hose coupling threads; and appendixes containing supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

974.1 FIRE HOSE

References.—Fire hose, *see* 202.41.

974.2 FIRE HOSE FITTINGS

National Board of Fire Underwriters. Fire Department Hose Connections for Sprinkler and Standpipe Systems, No. 23; 1939. Connection coupling of bronze or cast iron, number and inclination of inlets, coupling threads American standard B26; 1925, of the American Standards Assn., diagrams of sprinkler and standpipe connections and check valve clappers, outlet sizes, and marking.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Fire Department Hose Connections for Sprinkler and Standpipe Systems. Covers materials and workmanship, strength, inlets, outlet, and marking.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Standards for Water Spray Nozzles and Extinguishing Systems. Covers general requirements, manually operated-portable hose and spray type nozzles, fixed nozzle systems, and maintenance.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Use of Standard Small Hose Couplings. Recommended practice for the most efficient use of the standard couplings; to permit the maximum degree of interchangeability and flexibility in fire fighting operations.

Underwriters' Laboratories, Inc. Standard for Construction of Play Pipes, 1926. For fire hose nozzle and play pipe, design and construction detail requirements for materials, length, butt, handles, workmanship, marking, and dimensional drawings.

Underwriters' Laboratories, Inc. Standard for 2 1/2-Inch Couplings for Rubber Lined Fire Hose, 1915. For use on single and double jacketed cotton rubber lined, and rubber fire hose, using National Standard thread. Design and dimensional drawings for couplings, materials, marking, and finish.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 241-1. Nozzle; Fire Hose, 1-Inch, Shut-Off Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 241-2. Nozzle; Fire Hose, Screw-Tip, Type With Extra Tip Carriers.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 241-4. Nozzle; Garden Hose.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 277-1. Nozzle; Back Pack Pump, Combination Fan-Spray.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 277-2. Nozzle; Back Pack Pump, Combination Three-Spray.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 277-3. Nozzle; Back Pack Pump, Twin-Nozzle Type.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-103. Coupling; 1 1/2-Inch Hose Tee, With 1-Inch Outlet.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-104. Coupling; Reducer, 1 1/2- to 1-Inch.

U. S. Gov., Federal Specification WW-C-621a; 1941. Couplings; Hose, Cotton (Rubber-Lined) and Linen (Unlined). Covers eight types. Gives requirements for design, pressure, finish, chemical composition, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-C-621a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for finish of metal parts, couplings, expansion rings, and coatings.

U. S. Gov., Federal Specification WW-C-623a; 1933. Couplings; Hose, Garden and Water. Covers two types—(A) slotted expansion (1 1/2-inch only), and (B) lug or ribbed shank. Gives requirements for finish, parts, chemical composition, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-C-623a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for material for all parts except expansion rings.

U. S. Gov., Federal Specification WW-C-626; 1933. Amendment 1; 1934. Couplings; Hose, Oil-Suction and Discharge. Covers three types—(A) slotted expansion (for 4-inch hose only); (B) lug, ribbed shank; and (C) iron pipe nipples. Gives requirements for design, hydrostatic pressure, finish, parts, chemical composition, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-C-626; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for material for all parts except expansion rings.

U. S. Gov., Federal Specification WW-C-631; 1933. Couplings; Hose, Pneumatic and Spray (for Working Pressures Up to 150 Pounds Per Square Inch). Covers one type and grade. Gives requirements for hydrostatic pressure, dimensions, parts, chemical composition, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification WW-C-636; 1931. Coupling; Hose, Steam. Covers two types—(A) slotted expansion and (B) hexagon shank. Gives requirements for finish, parts, composition, and dimensions; methods of sampling, inspection, and tests; and packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-C-636; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for material for all fittings except expansion rings.

U. S. Gov., Federal Specification WW-C-646; 1934. Couplings; Hose, Water-Suction. Covers five types—(A) slotted expansion, (B1) rocker-lug expansion, (B2) regular pin-lug expansion, (B3) long-handle expansion, and (C) lug-shank. Gives requirements for design, finish, parts, chemical composition, and dimensions; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-WW-C-646; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for finish of metal parts, couplings, and expansion rings.

References.—Standard threads for couplings, hydrants, and valves, *see* 974.0; methods of testing and general requirements for metals, *see* 600.1, 644,11; fire hydrants, *see* 607.6.

974.3 FIRE HOSE RACKS

U. S. Gov., Federal Specification WW-P-541a; 1940. Plumbing Fixtures (for) Land Use. Includes requirements for fire hose rack and hose. Covers malleable iron, or steel, or brass rack suitable for hanging 1 1/2-inch diameter linen hose in vertical loops on pins or supports. Requirements given for valves, hose, and fittings; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-WW-P-541a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed requirements for metals and finishes, standard materials, illustrations, selections, and air gaps.

974.4 FIRE APPARATUS HOUSING

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 24.20, 1942. Hose Houses and Equipment. Covers suggested designs for hose houses, suggested construction, hardware, knock-down hose houses, equipment, plan and elevation, and framing plan.

National Board of Fire Underwriters. Hose Houses for Mill Yards, No. 25; 1940. Standards for the construction and equipment. Gives sizes, materials, illustrated designs, for frame hose housing, hose shelving, hardware, fire equipment, length and size of hose provided.

975. FIRE PUMPS AND FITTINGS

References.—Fire pumps and accessories, *see* 755.0, 755.1, 755.2; automobile fire trucks, *see* 722.2.

976. AUTOMATIC SPRINKLER SYSTEMS

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1942. Specifications for Buildings for Railroad Purposes; Sprinkler System (Dry Pipe, Wet Pipe, or Deluge). Gives requirements for piping system, hangers, supports, control and drain valves, air supply, sprinkler heads, source of water supply, thimbles, sleeves, post indicator valves, electric wiring, fire department connection, tests, painting, and guarantee.

Associated Factory Mutual Fire Insurance Companies. Rules for Installing Dry Pipe Sprinkler Equipment, 1936. Maximum permissible size of system on one valve, installation rules, rules on location of dry pipe valves, construction of valve rooms, by-pass connections, capacity and equipment of air compressor, electrical and mechanical alarms, directions for setting and testing dry pipe valve, care and inspection of system.

Associated Factory Mutual Fire Insurance Companies. Standardization of 2 1/2-Inch Hose Threads for Fire Hose, Couplings, Hydrants, and Valves. Dimensions of standard thread for hose couplings, for coupling swivels and hydrant caps, and for hydrant nipples.

National Board of Fire Underwriters. Care and Maintenance of Sprinkler Systems, 1940. Covers responsibility of owner, details of maintenance, spring inspection, fall inspection, watchman, and public fire department.

National Board of Fire Underwriters. Sprinkler Equipments, No. 13; 1940. These standards are in general the minimum requirements for installation of sprinkler equipments in buildings housing one or more hazard occupancies. Gives general information, preparation of building, water supplies and fire department connections, piping, valves, pipe fittings and pipe hangers, sprinklers, location and spacing of sprinklers, dry-pipe systems, nonfreezing solutions, thermostatically operated systems, sprinkler alarms, outside sprinklers for protection against exposure fires, and appendix.

National Board of Fire Underwriters. Water Spray and Extinguishing Systems, No. 15; 1941. Standards for the two methods of applying water spray which are by the use of hose lines and by the use of fixed systems of piping. Covers general requirements, manually operated portable hose and spray nozzles, fixed nozzle systems, and maintenance.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Automatic Sprinkler Ordinance. Suggested form and requirements for an automatic sprinkler ordinance. Covers definitions, authority, where installed, type of system and approval of plans, exemption and substitution of other fire protection equipment, appeal, maintenance, penalties, effective date, and appendices.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Care and Maintenance of Sprinkler Systems. Covers responsibility of the owner, details of maintenance, spring inspection, fall inspection, watchman, and public fire department.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Sprinkler Equipment. Standards for the installation of sprinkler equipment. Covers general information, preparation of building, water supplies and fire department connections. piping, valves, pipe fittings and pipe hangers, sprinklers, location and spacing of sprinklers, dry-pipe systems, nonfreezing solutions, thermostatically operated systems, sprinkler alarms, outside sprinklers for protection against exposed fires, supplementary details, and reference and explanatory data.

National Fire Protection Assn. National Fire Codes for Extinguishing and Alarm Equipment, 1943. Standards for Water Spray Nozzles and Extinguishing Systems. Covers general requirements, manually operated-portable hose and spray type nozzles, fixed nozzle systems, and maintenance.

Underwriters' Laboratories, Inc. Standard for Automatic Sprinklers, Section III, Subject 199; 1919. Includes general requirements for automatic sprinklers. Gives design and construction, practicability, durability, strength, reliability of operation, uniformity.

References.—Wrought-iron pipe and fittings, steel pipe and fittings, *see* 607.3, 607.4; valves, *see* 607.6; cast-iron pipe and long-turn sprinkler fittings, *see* 607.14.

977. HYDRANTS AND PARTS

References.—Fire hydrants, *see* 607.6.

978. FIRE BARRELS AND PAILS

References.—Fiber fire bucket, *see* 951.63; shipping barrels and pails, *see* 951.1, 951.6.

979. MISCELLANEOUS FIRE EXTINGUISHING APPARATUS

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 295. Reel; Live-Hose, High-Pressure.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-296. Reel; Retracting-String.

979.1 FIRE LADDERS

National Safety Council (American Society of Safety Engineers, Engineering Section). American Standards Assn., A14-1935. Code for Construction, Care, and Use of Ladders. Definition of terms; kind and quality of materials; specifications and construction of fixed, single, and extension type fire ladders. Is not intended to include equipment of organized fire departments.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification No. 221. Ladder; Fire-Truck Loading.

References.—Ladders for commercial use *see* 429.4.

979.2 FIRE LANTERNS

979.3 FIRE ALARMS

References.—Fire alarm systems, *see* 718.30, 718.32.

980-989 BRUSHES AND BROOMS

981. BROOMS

981.0 GENERAL ITEMS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R88-37; 1937. Floor Sweeps. This recommendation establishes standard stock sizes of floor sweeps covering length of block and handle, number of holes in block, weight of filling material, and trim for household, institutional, garage, warehouse, and industrial floor sweeps. Sponsored by American Brush Manufacturers Assn.

981.1 CORN BROOMS

American Hospital Assn., 34-1. Corn Brooms. Covers one type and two qualities—(B) parlor and (C) warehouse. Based on U. S. Gov. Federal Specification H-B-51.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Hide Broom. Of corn and rattan, weights per dozen. Warehouse Broom. Of corn, weights per dozen, illustrated.

U. S. Gov., Federal Specification H-B-51a; 1944. Brooms; Corn. Covers two qualities—(B) parlor and (C) warehouse. Gives requirements for type, sizes, material, workmanship, broom corn, fiber, handle, broom body, fastening, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

References.—Grades of broom corn, *see* 294; whisk brooms, *see* 981.5.

981.2 RATTAN BROOMS

American Hospital Assn., 34-4. Fiber Brooms. Covers one type and three sizes. Based on U. S. Gov. Federal Specification H-B-56.

American Hospital Assn., 34-7. Rattan Push Brooms. Covers one type and grade. Based on U. S. Gov. Federal Specification H-B-71.

American Hospital Assn., 34-10. Rattan Upright Brooms. Covers one type and grade. Based on U. S. Gov. Federal Specification H-B-75.

U. S. Gov., Federal Specification H-B-56; 1931. Amendment 2; 1941. Brooms; Fiber. Covers one in three sizes. Gives requirements for material, workmanship, body, handle fastening, ties and stitches, dry weights, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-71a; 1943. Brooms; Rattan, Push. Covers one type and one grade. Gives requirements for block, handle, stock, holes, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-75; 1933. Amendment 1; 1943. Brooms; Rattan, Upright. Covers one type and one grade. Gives requirements for handle, broom stock, cap, workmanship, broom head, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

981.3 WIRE BROOMS

U. S. Gov., Federal Specification H-B-111; 1933. Brooms; Wire, Push. Covers one type, grade, and size. Gives requirements for block and cover, handle, wire, holes, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

981.4 HAIR FLOOR SWEEPS

American Hospital Assn., 34-70. Hair Floor Sweeping Brushes. Covers one type and one grade in three sizes. Based on U. S. Gov. Federal Specification H-B-651.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Floor Brush. No. 16 of black horsehair, requirements on size of block, length of trim, and number of rows, with illustration.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Floor Sweeping Brush, M-911-39; 1939. Hair to be No. 29 grey Russian, or No. 30 Chinese bristle, conforming to standard sample, size of block, and holes for handle, setting and construction, in four sizes.

U. S. Gov., Federal Specification H-B-651; 1930. Amendment 5; 1944. Brushes; Sweeping, Floor, Hair. Covers one type and grade in three sizes, No. 1, 2, and 3. Gives requirements for stock, block, setting, handle, comparison sample, length and diameter of block, number of holes in inside and outside rows, weight of hair and fiber mixture per brush, and length of hair outside of block; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Standard sizes, *see* 981.0.

981.5 HOUSEHOLD AND WHISK BROOMS

American Hospital Assn., 34-16. Whisk Brooms. Covers one type and grade in 8-in. and 10-in. sizes. Based on U. S. Gov. Federal Specification H-B-101.

U. S. Gov., Federal Specification H-B-101; 1933. Amendment 3; 1944. Brooms; Whisk. Covers one type and grade in two sizes—8-in. and 10-in. Gives requirements for material, workmanship, body, handle, stitching, sizes, winding of handle, and weight; methods of sampling, inspection, and tests; and packaging, packing, and marking.

References.—Grades of broom corn, *see* 294; corn brooms, hair floor sweeps, *see* 981.1, 981.4.

981.6 BROOMS FOR INDUSTRIAL USE

981.61 Scrubbing Brooms

American Hospital Assn., 34-14. Scrubbing Brooms. Covers one type, grade, and size. Based on U. S. Gov. Federal Specification H-B-91.

U. S. Gov., Federal Specification H-B-91, 1933. Brooms; Scrubbing. Covers one type, grade, and size. Gives requirements for handle, stock, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

References.—Deck scrubbing brush or broom, *see* 982.3.

981.62 Pavement and Street Sweeping Brooms

U. S. Gov., Panama Canal, Purchasing Dept. Specification for Brooms, 1944. Street-sweeping, 16 in., bass bristles (African bass, or equal), without handles.

References.—Standard sizes of floor sweeps, *see* 981.0; corn brooms, rattan brooms, *see* 981.1, 981.2; push brooms, *see* 981.63.

981.63 Push Brooms

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Push Brooms. No. 261 of African bass with outer row of Bahia fiber, requirements on size of block, trim, and number of rows, illustrated.

References.—Hair floor sweep, *see* 981.4; wire push broom, rattan push broom, *see* 981.3, 981.2; standard sizes of floor sweeps, *see* 981.0.

981.64 Factory and Warehouse Brooms

References.—Corn warehouse brooms, *see* 981.1; rattan brooms, wire brooms, hair floor sweeps, scrubbing brooms, push brooms, *see* 981.2, 981.3, 981.4, 981.61, 981.63.

982. BRUSHES

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Brushes—Bristle, Hair, Fiber, and Wire, M-911-39-1939. Paint and varnish brushes for master and utility purposes; also roof, scrub, wash, duster, and wire brushes for railway use. Samples on file conform to A. A. R. standards, defines Russian bristle, Chinese bristle, French bristle, Indian bristle, civet and ox hair, etc. Details as to manufacture, tolerances, stamping, etc., for all types of brushes.

982.1 TOILET BRUSHES

U. S. Gov., Federal Specification H-B-321a; 1942. Brushes; Hair, Military. Covers one size and grade, in two types—(I) solid back and (II) aluminum face. Gives requirements for holes, stock, block, setting; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-571a; 1941. Amendment 1; 1944. Brushes; Shaving. Covers one type and one grade. Gives requirements for handle, handle measurements, finish, ferrule and ring, ferrule, and bristles; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification H-B-671a; 1942. Brushes; Tooth. Covers one grade and five types—(I) tufted end of sloping, (II) tufted ends, (III) oval, (IV) sloping, and (V) straight trim; class A—animal bristle stock and class B—synthetic (plastic) bristles. Gives requirements for stock, handles, holes, and bristle length out of handle; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-671a; 1943, changed requirements for specific gravity and holes.

982.2 PAINT BRUSHES

American Hospital Assn., 34-19. Calcimine Brushes. Covers one type and grade. Based on U. S. Gov. Federal Specification H-B-141.

American Hospital Assn., 34-37. Flat Fitch Brushes. Covers one type and grade in six sizes. Based on U. S. Gov., Federal Specification H-B-241.

American Hospital Assn., 34-40. Flat (High-Grade) Metal-Bound Paint Brushes. Covers one type and two grades in two sizes. Based on U. S. Gov. Federal Specification H-B-241 U. S. Gov., Dept. of Commerce, National Bureau of Standards, Simplified Practice Recommendation R43-28.

American Hospital Assn., 34-43. Flat (Medium-Grade) Metal-Bound Paint Brushes. Covers one type and grade in four sizes. Based on U. S. Gov. Federal Specification H-B-431.

American Hospital Assn., 34-46. Radiator Bronzing Brushes. Covers one type and one grade in three sizes— 1 in., 1 1/2 in., and 2 in. Based on U. S. Gov. Federal Specifications H-B-451.

American Hospital Assn., 34-52. Sash-Tool Brushes. Covers one grade in five sizes, oval type, and two sizes, round type. Based on U. S. Gov. Federal Specification H-B-491a.

American Hospital Assn., 34-67. Wall Stippling Brushes. Covers one type and grade. Based on U. S. Gov. Federal Specification H-B-636.

American Hospital Assn., 34-73. Flat Varnish Brushes (Double X Thickness). Covers one type and grade in five sizes. Based on U. S. Gov. Federal Specification H-B-701.

American Hospital Assn., 34-76. Flat Varnish Brushes (Triple X Thickness). Covers one type and one grade in four sizes. Based on U. S. Gov. Federal Specification H-B-706.

American Hospital Assn., 34-79. Whitewash Brushes. Covers one type and grade. Based on U. S. Gov. Federal Specification H-B-731.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Stencil Brush. Of Chinese bristle, requirements on length of bristle, diameter, vulcanized in rubber, illustrated.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Angular Fresco Liner Brushes, M-911-39; 1939. Good grade of white French bristle set in nickle tin ferrule and formed to an angle; artist style handle.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div., Manual of Standard and Recommended Practice, 1942. Artist or Fitch Brushes, M-911-39; 1939. For French, Polish, or German white bristle; also for Tientsin Chinese black bristle brushes, ferrules, handle, setting, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Black Sable Lettering and Striping Brushes, M-911-39; 1939. Best quality commercial grade, set in cement in seamless ferrule, with polished handle. Six sizes of lettering; four striping brushes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Civet Color Brushes, M-911-39; 1939. Civet Cat Tail hair and Tientsin Chinese bristle—1/2- to 4-in. sizes, construction, handle, and finish.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and

Recommended Practice, 1942. Flat Sash Trim Brushes, M-911-39; 1939. From Tientsin Chinese Bristle, conforming to sample, 1 1/2- and 2-in. ferrule, handle, setting, and details of construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Flat Varnish Brushes, M-911-39; 1939. No. 4 white bristle to be French, Polish, or German origin, and No. 5 to be Chinese bristle, three sizes in both triple thick and double thick brush. Includes quality of bristle, ferrule, handle, setting, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Kalsomine Brushes, M-911-39; 1939. Made from white Tampico fiber, set in plain sended kalsomine block, size No. 41, minimum number of holes, size of hole, and length of fiber.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice; 1942. Oval Sashtool Brushes, M-911-39; 1939. Covers quality of Tientsin Chinese bristle, ferrule, handle, setting, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Oval Varnish and Paint Brushes, M-911-39; 1939. Quality of Chinese bristle, ferrule, handle, setting, and construction, for four sizes of brush.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Ox Hair Color Brushes, M-911-39; 1939. Mixture of Ox hair and Tientsin Chinese bristle in 1/2- to 4-in. sizes, ferrule, handle, setting, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Round Marking Brush, M-911-39; 1939. For dome point, black Tientsin Chinese or white French or Polish bristle set in bright tin ferrule with unpolished marking handle.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Includes Stencil Brushes, M-911-39; 1939. Four sizes of good yellow bristle, French, Polish, or Russian origin, and one size civit cat tail hair; ferrule, handle, setting, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Sword Striper Brushes, M-911-39; 1939. From best grade Kazan squirrel tail hair, inserted in a split top handle, and secured with brass brush wire.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wall Brushes—Metal and Leather Bound, M-911-39; 1939. Quality of Chinese bristle, ferrule, handle, setting, in various sizes, and construction.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R43-28; 1928. Paint and Varnish Brushes. This recommendation establishes a schedule of stock sizes of brushes. Dimensions are also given for the handles and ferrules. Sponsored by the American Brush Manufacturers Assn.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R121-31; 1931. Block Sizes for Calcimine Brushes (Dutch, Semi-Dutch, and Baby Dutch). This recommendation establishes a simplified list of stock sizes for calcimine brush blocks. Sponsored by the American Brush Manufacturers Assn.

U. S. Gov., Federal Specifications H-B-141; 1930. Amendment 2; 1943. Brushes; Calcimine. Covers one type and grade. Gives requirements for bristle and horsetail hair mixture, casing, middle, handle, ferrule, setting, comparison sample, width of brush inside ferrule, depth of ferrule, minimum total weight of bristle in brush, approximate width of strip filler, bristle hole in band, length of bristle outside of band, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-181; 1930. Amendment 1; 1944. Brushes; Dauber, Long-Paddle. Covers one type, grade, and size. Gives requirements for block, holes, brush stock, finish, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-241; 1930. Amendment 3; 1944. Brushes; Fitch, Flat. Covers one type and grade in three sizes. Gives requirements for stock, handle, ferrule, setting, comparison sample, diameter of oval at bristle, diameter of ferrule at handle, depth of ferrule, minimum weight of bristle in finish brush, minimum of hold of bristle in ferrule, length of bristle outside of ferrule, and tolerances; method of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-256; 1930. Amendment 5; 1944. Brushes; Flowing, Skunk-Hair. Covers one type in five sizes—1 in., 1 1/2 in., 2 in., 2 1/2 in., and 3 in. Gives requirements for hair and bristle, handle, ferrule, setting, comparison sample, washing, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-351; 1930. Brushes; Lacquering, Flat. Covers one type and grade in three sizes—Nos. 1, 2, and 3. Gives requirements for hair, handle, ferrule, setting, outside diameter of ferrule at handle, outside width and thickness of ferrule at hair, depth of ferrule, length of handle above ferrule, and length of hair outside of ferrule; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-351; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted steel in lieu of tin, changes the requirements for setting compound, and gives tolerance permitted in depth of ferrule.

U. S. Gov., Federal Specification H-B-371; 1930. Amendment 1; 1944. Brushes; Marking. Covers one type and grade in three sizes—Nos. 1, 2, and 3. Gives requirements for bristle, handle, ferrule, setting, diameter of ferrule at bristle, depth of ferrule, minimum hold of bristle in ferrule, and length of bristle outside ferrule; methods of sampling inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-391; 1930. Amendment 1; 1941. Brushes; Mottling. Covers one type and grade, in three sizes—Nos. 1, 2, and 3. Gives requirements for hair handle, ferrule, setting, inside width and thickness of ferrule, depth of ferrule, minimum weight of hair in finished brush, minimum hold of hair in ferrule, and length of hair outside ferrule; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-391; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted steel in lieu of nickled tin and gives tolerance permitted in depth of ferrule.

U. S. Gov., Federal Specification H-B-421; 1930, and Amendment 3-1943. Brushes; Paint, Metal-Bound, Flat (High Grade). Covers one type and two grades in two sizes—No. 1, 3 1/2 in.; and No. 2, 4 in. (width of brush inside of ferrule). Gives requirements for bristle, handle, ferrule, setting, width and thickness of brush inside ferrule, depth of ferrule, minimum weight of bristle, total thickness of strips or filler, bristle hold in ferrule, and minimum length bristle outside of ferrule; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-431; 1930. Amendment 2; 1943. Brushes; Paint, Metal-Bound, Flat (Medium-Grade). Covers one type and grade in four sizes—3, 3 1/2, 4, and 4 1/2 in. (width of brush inside of ferrule). Gives requirements for bristles, handle, ferrule, setting, width and thickness of brush inside ferrule, depth and thickness of ferrule, minimum weight of bristle in finished brush, thickness of strip or filler; bristle hold in ferrule, and minimum length of bristle outside of ferrule; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-436; 1941. Brushes; Paint, Metal-Bound, Flat (Utility Wall). Covers one type and one grade in three sizes--3 in., 3 1/2 in., and 4 in. (width of brush inside of ferrule). Gives requirements for stock, handle, ferrule, setting, comparison sample, width and thickness of brush inside ferrule, weight of stock in finished brush, stock hold in ferrule, length of stock outside ferrule, and depth of ferrule; methods of sampling, inspection, and test; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Federal Specification H-B-451; 1930. Amendment 3; 1944. Brushes; Radiator, Bronzing. Covers one type and one grade in three sizes—1 in., 1 1/2 in., and 2 in. Gives requirements for hair, handle, ferrule, setting, comparison sample, width and thickness of brush inside ferrule, depth of ferrule, minimum weight of hair in finished brush, minimum hold in ferrule, and minimum length of hair outside ferrule; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-G-471; 1933. Brushes; Roof, Knotted-Style, Three Knots. Covers one type and size in two grades—A and B. Gives requirements for brush stock, knots, ferrule, block, handle, setting, conformity and standard sample, and required details; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-471; 1942, required brush stock to be 100 percent Tampico fiber.

U. S. Gov., Federal Specification H-B-491a; 1939. Amendment 1; 1941. Brushes; Sash-Tool. Covers one grade, and two types—(I) oval, in five sizes, and (II) round, in two sizes. Gives requirements for bristles, handle, ferrule, setting, dimensions of oval at bristle, diameter of ferrule and depth of ferrule, minimum weight of bristle in brush, minimum length of bristle in and out of ferrule, and length of handle; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-H-B-491a; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted one type (oval) and five sizes for the two types and their respective sizes; substituted bristle and horsetail hair mixture for bristles; substituted coated steel for nickel steel pinned; removed requirements for use of hard rubber; and gave tolerance permitted in depth of ferrule.

U. S. Gov., Federal Specification H-B-621a; 1939. Brushes; Stencil (Flag Ends Cut). Covers two types—(I) round sash tool handle (sizes No. 1 and No. 2) and (II) regular stencil handle (sizes Nos. 3, 4, and 5). Gives requirements for bristles, setting, handles, ferrules, diameter and depth of ferrule, minimum weight of bristle in brush, minimum hold of bristle in ferrule, minimum length of bristle outside ferrule, and minimum over-all length; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-H-B-621A; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) permitted use of other material in lieu of hard rubber, substituted coated steel in lieu of nickel-plated steel, and gave tolerance permitted in depth of ferrule.

U. S. Gov., Federal Specification H-B-636; 1930. Brushes; Stippling, Wall. Covers one type and grade. Gives requirements for bristle, block, setting, standard sample, diameter of holes, number of holes, number of rows, size of blocks, minimum length of bristle clear of block, and minimum weight of bristle in finished brush; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-636; 1942. (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted bristle and horsetail hair mixture for bristle stock and removed requirements for use of copper and brass.

U. S. Gov., Federal Specification H-B-696; 1941. Amendment 1; 1941. Brushes; Varnish, Flat. Covers one type and grade in three sizes--Q, 1 1/2, and 2 in. Gives requirements for bristle, handle, setting, ferrule, standard sample, minimum width and thickness of brush inside ferrule, minimum weight of bristle in finished brush, minimum hold of bristle in ferrule, minimum length of bristle out of ferrule, and minimum depth of ferrule; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency

Alternate Federal Specification E-H-B-696; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted bristle and horsetail hair mixture in lieu of bristles; and coated steel in lieu of nickel-plated or tin-coated steel; removed requirement to use hard rubber; gave tolerance permitted in depth of ferrule; and changed detail requirements accordingly.

U. S. Gov., Federal Specification H-B-701; 1930. Amendment 2; 1943. Brushes; Varnish, Flat (Double X Thickness). Covers one type and grade in five sizes—1, 1 1/2, 2, 2 1/2, and 3 in. Gives requirements for bristle, handle ferrule, setting, widths and thickness of brush inside ferrule, depth of ferrule, minimum weight of bristle in finished brush, minimum hold of bristle in brush, and minimum length of bristle out of ferrule; methods of sampling, inspection, and tests; requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-706; 1930. Amendment 1; 1943. Brushes; Varnish, Flat (Triple X Thickness). Covers one grade and type in four sizes—1 1/2, 2, 2 1/2, and 3 in. Gives requirements for bristle, handle, ferrule, setting, comparison sample, width and thickness of brush inside ferrule, depth of ferrule, minimum weight of bristle in finished brush, minimum hold of bristle in ferrule, and minimum length of bristle out of ferrule; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-711; 1941. Amendment 1; 1943. Burshes; Varnish, Oval. Covers one type and grade and two sizes—2 and 4. Gives requirements for ferrule, setting, handle, bristles, standard sample, minimum inside diameter of ferrule, minimum length out of ferrule, weight and length out of ferrule of bristles, minimum length and hold in ferrule, of handle, greatest width and thickness of handle at plug end, and depths of wooden ring inside of ferrule; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-731; 1930. Brushes; Whitewash. Covers one type and grade. Gives requirements for bristle, ferrule, block, setting, standard sample, width of brush inside of band, depth of band, minimum weight of bristle in finished brush, width of strip in brush, bristle hold in band, minimum length of bristle out of band, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

Emergency Alternate Federal Specification E-H-B-731; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted bristle and horsetail hair stock in lieu of bristles; gave tolerance permitted in length of ferrule; and changed detail requirements accordingly.

U. S. Gov., Federal Specification RR-S-714; 1943. Amendment 1; 1944. Stencil-Outfits (Letters and Figures); Metallic. Shall be of the lock-edge type, and shall be 1/2, 1, 2, 4, and 6 in. sizes. Covers material, workmanship, and details of stencil-outfit, stencils, ink, brush, stencil box, and marking; methods of sampling, inspection, tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 38B28d; 1944. Brushes; Lettering.

U. S. Gov., Navy Dept. Specification 38B41; 1944. Brushes; Paint, Flat, Synthetic-Filament Bristles.

U. S. Gov., U. S. Army, Corps of Engineers. Specification 30-36; 1924. Brush; Water Color, Lithographers'.

U. S. Gov., Veterans Administration. Specification VA-X-25b; 1941. Brushes; Artists', Bristle.

U. S. Gov., Veterans Administration. Specification VA-X-26b; 1941. Brushes; Artists', Round Red Sable.

U. S. Gov., Veterans Administration. Specification VA-X-27b; 1941. Brushes; Stencil, Artists.

References.—Glue brushes, *see* 982.9; painters' dust brushes, *see* 982.3.

982.3 CLEANING BRUSHES

American Hospital Assn., 34-22. Ceiling and Wall Dust Brushes. Covers one type and grade in 8-in. and 12-in. sizes. Based on U. S. Gov. Federal Specification H-B-191.

American Hospital Assn., 34-25. Counter Dust Brushes. Covers one type and size in two grades. Based on U. S. Gov. Federal Specification H-B-201a.

American Hospital Assn., 34-28. Painters' Flat Dust Brushes. Covers one type and two grades. Based on U. S. Gov. Federal Specifications H-B-211.

American Hospital Assn., 34-31. Painters' Round Dust Brushes. Covers one type and grade. Based on U. S. Gov. Federal Specification H-B-216.

American Hospital Assn., 34-34. Radiator Dust Brushes. Covers one size and grade in two types. Based on U. S. Gov. Federal Specification H-B-221.

American Hospital Assn., 34-49. Sanitary or Toilet Brushes. Covers one grade and two types. Based on U. S. Gov. Federal Specification H-B-481.

American Hospital Assn., 34-55. Deck Scrubbing Brushes. Covers one type, grade, and size. Based on U. S. Gov. Federal Specification H-B-531.

American Hospital Assn., 34-58. Hand Floor Scrubbing Brushes. Covers one type, grade, and size. Based on U. S. Gov., Federal Specification H-B-541.

American Hospital Assn., 34-61. White Tampico Hand Scrubbing Brushes. Covers one type, grade, and size. Based on U. S. Gov. Federal Specification H-B-551.

American Hospital Assn., 34-64. Sidewalk Brushes. Covers one type and grade in 18-in., 24-in., and 30-in. sizes. Based on U. S. Gov. Federal Specification H-B-591.

American Hospital Assn., 43-4. Beaker, Burette, Cylinder, and Test-Tube Brushes. Covers one grade in five types. Based on U. S. Gov. Federal Specification H-B-126.

American Hospital Assn., 70-1. Bedpan Brush. Covers one type, one grade, and one class.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Fiber Brushes. Requirements on size of brush, palmetto or bassine fiber, bristle length, number of rows and number of holes; includes fiber fountain brush for washing beef, fountain sheep nose brush, washing brush for beef necks, washing brush for beef backs, with illustrations.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment; 1928. Wire Brushes.

Requirements on size of block, flat or round wire, bristle length, ends per hole, number and rows of holes; includes butchers' block brush, metal clearing brush for structural steel and castings, flat wire fountain brush for brushing out beef killing floors and scrubbing chutes and tables, flatback wire brush for kettles, shoe-handle wire scratch brush for cleaning files and dies, with illustrations.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Battery Cleaning Brushes, M-911-39; 1939. Requirements for gage of brass spring wire, stapled into a hardwood curved handle approximately 12 in. long, size of brush part, number of holes, rows of holes, diameter of holes, and length of wire.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Bead Scrub Brush, M-911-39; 1939. Two types—stiff grey Russian bristle with half Indian bristle, and of Chungking Chinese bristle; four-row bead scrub block of hardwood setting and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Counter Duster Brushes, M-911-39; 1939. Two types—from Chungking Chinese bristle, and from grey Russian bristle; hardwood duster block setting compound, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechinical Div. Manual of Standard and Recommended Practice, 1942. File Cleaning Brushes, M-911-39; 1939. Round steel wire, drawn into a fabric backing and nailed to a wooden block; size of block and length of wire.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Hopper Brushes, M-911-39; 1939. Made of good quality grey Tampico, tightly woven in spiral grooves in wooden curved handle, or as approved. Length of brush part, over-all, and diameter.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Machine Shop Bench Brushes, M-911-39; 1939. Made with grey Tampico staple, set in hardwood block 13-in. long with string in handle.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Moulder Double Duster Brush, M-911-39; 1939. One side half-stiff grey Russian, and other side grey Tampico, plain sanded hardwood block, setting, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Moulder's Wire Brush, M-911-39; 1939. Two sizes, made with flat steel wire pinned or stapled in hardwood block, requirements for sizes of block, number and size of hole, 2- and 4-in. projection of wire out of block.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Oblong Car Wash Brush, M-911-39; 1939. Made from mixture of Russian, Chinese, and Indian bristle, conforming to standard sample, maple or sycamore block with four holes for handle, setting, construction, and dimensions.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Painters' Flat Duster Brush, M-911-39; 1939. Quality of bristle, handle or block, setting, and construction. Includes also counter duster brush, plush duster brush, moulder double duster brush, with sizes listed as standard for railway purposes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Palmetto Scrub Brushes, M-911-39; 1939. From good palmetto fiber, staple set in oblong block, size, and number of holes.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Plush Duster Brushes, M-911-39; 1939. Grey and black Indian bristle, hardwood duster block with handle, setting compound, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Round Car Scrub Brush, M-911-39; 1939. From stiff grey Russian Bristle, with half black or grey Indian bristle: round seamless nickled steel ferrule, set in vulcanized rubber; round paint style handle.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Round Car Wash Brushes (A and B), M-911-39; 1939. Good quality grey Russian bristle, stiff and semi-stiff grades, block, setting, and details of construction to conform to standard sample.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. White Tampico Scrub Brush, M-911-39; 1939. No.37 brush set in standard floor scrub block with pointed ends, exact size, number of holes, diameter of hole, and length of fiber given.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Wire Scratch Brush, M-911-39; 1939. Curved and four-row shoe-handle types; requirements for gage of wire, hardwood block, size, and number of holes; and length of wire.

National Assn. of Dyers and Cleaners of the U. S. and Canada. The Spotting Department, 1940. Includes recommendations for the various types of brushes used in the spotting department.

National Assn. of Purchasing Agents. Handbook of Commodity Data Sheets, 1938. Brushes; Cleaning. Covers definition, materials, standard sizes, manufacture, specifications, uses, and ordering instructions.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Simplified Practice Recommendation R167-37; 1937. Counter, Window, and Radiator Brushes. This recommendation establishes a simplified schedule of stock varieties and fillings for counter, window, and radiator brushes. Sponsored by the American Brush Manufacturers Assn.

U.S. Gov., Federal Specification H-B-126; 1938. Brushes; Beaker, Burette, Cylinder, and Test Tube. Covers one grade in five types—(I) beaker, with bristles on wooden or wire handle; (II) burette, with bristles on wire handle; (III) cylinder with brushes on wire handle; (IV) cylinder, with brushes on wooden handle; and (V) test tube, with bristles on wire handles.

Gives requirements for brush stock, wood handles, wire handles, bristles, finish; methods of inspection, sampling, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-H-B-126; 1942, (issued by Procurement Div., Treasury Dept. U. S. Gov.) changed requirements for utilization of brass or bronze and gave requirements for steel in lieu thereof.

U. S. Gov., Federal Specification H-B-151; 1930. Brushes; Casting. Covers one type and grade. Gives requirements for block, wire, holes, finish, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-171; 1930. Brushes; Cuspidor. Covers one type, grade, and size. Gives requirements for stick, construction, finish, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-191; 1930. Amendment 1; 1944. Brushes; Dust, Ceiling and Wall. Covers one type and grade in two sizes, 8 in. and 12 in. Gives requirements for stock, block, handle, number of holes, depth of holes, and minimum weight of bristle per brush; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-201a; 1940. Amendment 2; 1942. Brushes; Dust, Counter. Covers one type and size, and of two grades—(A) with Chinese or Russian bristles and (B) with live horsetail hair. Gives requirements for bristles, block, setting, holes, minimum length of bristles clear of block, minimum weight of bristles, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-H-B-201a; 1943, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed the requirements of grade A brushes.

U. S. Gov., Federal Specification H-B-211; 1930. Amendment 1; 1941. Brushes; Dust, Painters', Flat. Covers one type in two grades—A and B. Gives general and detailed requirements for handle, bristle, setting, standard sample, width of block, thickness of block at bristle, diameter and number of outside and middle holes, number of outside and middle knots, minimum length of bristle clear of block, and minimum weight of bristle in finished brush; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-211; 1943, (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed general requirements and detail requirements.

U. S. Gov., Federal Specification H-B-216; 1930. Brushes; Dust, Painters', Round. Covers one type and grade. Gives detail requirements for bristle, handle, setting, standard sample, diameter and number of inside and outside holes, outside diameter of block, minimum length of bristle clear of block, and weight of bristle in finished brush; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-216; 1943, changed requirements for stock, handle, staple setting, comparison sample, and packing.

U. S. Gov., Federal Specification H-B-221; 1933. Amendment 1; 1939. Brushes; Dust, Radiator. Covers one grade and size in two types—(I) wooden handle and (II) twisted handle. Gives detail requirements for stock, block and handle, holes, setting, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-221; 1942; (issued by Procurement Div., Treasury Dept., U. S. Gov.) changed the requirements for brush wire.

U. S. Gov., Federal Specification H-B-271; 1933. Brushes; Garage, Fiber. Covers one type and grade in three sizes—14-in., 18-in., and 24-in. (length of block). Gives requirements for block, setting, handle, widths and thickness of block; number of rows, number and diameter of holes, depth of holes, and length of turn out of block; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-328; 1943. Brushes; Hand, Scrub. Covers one type of brush with pig and/or hog bristles or synthetic bristles. Gives requirements for block and finish, holes, staples, stock, bristle stock, synthetic bristle stock, fastness to boiling water, fastness to light, and sterilization; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-481; 1939. Amendment 1; 1944. Brushes; Sanitary or Toilet. Covers one grade and two types—(I) twisted in wire, curved brush head, and (II) spiral wound, straight brush head. Gives requirements for wires, fibers, stock, brush heads, handles, and finish; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U.S. Gov., Federal Specification H-B-521; 1930. Amendment 3; 1944. Brushes; Scrubbing, Clothes. Covers one type and grade. Gives requirements for material and workmanship, block, stock, holes, finish, ends of block, top edge of block, and tolerances; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-531; 1930. Amendment 3; 1940. Brushes; Scrubbing, Deck. Covers one type, grade, and size. Gives requirements for block, handle, brush stock; dimensions, holes, tolerances, and finish of block; dimensions, tolerances, and finish of handle; stock, staples, methods of sampling, inspection, tests, and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-531; 1943, changed requirements for block, brush stock, and construction.

U. S. Gov., Federal Specification H-B-541; 1930. Amendment 2; 1938. Brushes; Scrubbing, Floor, Hand. Covers one type, grade, and size, Gives requirements for block, holes, brush stock, methods of sampling, inspection, tests, packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-541; 1943, changed requirements for block, holes, and brush stock.

U. S. Gov., Federal Specification H-B-551; 1933. Amendment 3; 1939. Brushes; Scrubbing, Hand, White-Tampico. Covers one type, grade, and size. Gives requirements for block, holes, brush stock, finish, tolerances, methods of sampling, inspection, tests, packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-551; 1943, changed requirements for block and brush stock.

U. S. Gov., Federal Specification H-B-591; 1933. Brushes; Sidewalk. Covers one type and grade in three sizes—18-in., 24-in., and 30-in. Gives requirements for stock, block, handle, holes, and tolerances; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-681; 1934. Amendment 1; 1939. Brushes; Typewriter. Covers two types: (I) Machine-dusting in three classes—(A) cone style, (B) paint-brush style, wire handle, and (C) paint-brush style, wood handle; and (II) type-cleaning in two classes—(A) tooth-brush style and (B) twisted-in-wire style). Gives requirements for designs, bristles, handles, and ferrules; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-751; 1934. Amendment 1; 1944. Brushes; Window. Covers one grade and size, and two types—(A) horsehair and (B) horsehair-and-fiber (mixture). Gives requirements for block, stock, handle, holes, setting, and tolerance; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, 1943. Brush; Meat Block.

U. S. Gov., Marine Corps Specification, 1933. Brush; Wire, Brass, for Pistol, Caliber .45.

U. S. Gov., Navy Dept. Specification 13B13g; 1944. Brushes; Boiler-Tube, Wire, Sectional, Push-Brushes.

U. S. Gov., Navy Dept. Specification 13B14d; 1944. Brushes; Boiler-Tube, Wire-Bristle, Expanding-Type, For Use With Cleaning-Outfits, Boiler-Tube, Electric Motor-Driven and Air Motor-Driven.

U. S. Gov., Navy Dept. Specification 13C8d; 1940. Cleaning-Outfits; Boiler-Tube, Motor-Driven.

U. S. Gov., Navy Dept. Specification 38B25c; 1945. Brushes; Cleaning, Steel-Wire, Rectangular, Handled.

U. S. Gov., Navy Dept. Specification 40B5a; 1945. Brushes; Wire, Rotary, Cup, and Radial (Disk).

U. S. Gov., Post Office Dept., Div. of Motor Vehicle Service, Bureau of the Fourth Assistant Postmaster General. Specifications for Brushes; Fountain, for Truck Washing.

U. S. Gov., Treasury Dept., Procurement Div., 526a; 1942. Brushes; Draftsmen's, Dust. Covers one type and one grade. Gives requirements for stock, block and handle, holes, and setting; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Ordnance Dept. Specification 30-62; 1932. Brush; Cleaning, Motor.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 30-60A; 1938. Brush; Horse, M-1912.

U. S. Gov., U. S. Army, Medical Dept. Specification 30-64A; 1940. Brush; Meat Block.

U. S. Gov., U. S. Army, Medical Dept. Specification 30-65; 1939. Brush; Hand.

U. S. Gov., U. S. Maritime Commission. Specification 64-MC-9a; 1943. Brushes; Bakers', Bakers' Bench or Flour, and Butchers' Block. Covers one grade and three types—(I) bakers', (II) bakers' bench or flour (III) butchers' block. Gives requirements for bristles, handles, workmanship, and details for each type; sampling, inspection, and methods of test; and packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-MM-333; 1944. Sink Brushes.

References.—Floor sweeps, *see* 981.4, 981.0.

982.4 POLISHING BRUSHES

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Stove Brushes, M-911-39; 1939. Made from good quality Tampico fiber, set in solid block, arched handle fastened to block with two screws, size of block minimum holes, diameter of holes, and length of fiber.

U. S. Gov., Federal Specification H-B-131; 1933. Amendment 2; 1944. Brushes; Blacking and Dauber. Covers one type, size, and three grades—(A) 100 percent horse hair, (B) 50 percent horse hair and 50 percent palma fiber, and (C) 100 percent palma fiber. Gives requirements for block, stock, workmanship, tolerances, and details; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Navy Dept. Specification 38B26b; 1942. Brushes; Floor, Waxing and Polishing.

U. S. Gov., Navy Dept. Specification 38B27b; 1942. Brushes; Platers'.

982.5 BRUSHES FOR INDUSTRIAL USE

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Acid Brushes, M-911-39; 1939. To be yellow flagged Tampico fiber, nickeled tin lock seam ferrule, peerless style varnish hardwood handle, setting in vulcanized rubber, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Leather Bound White Wash or Roofing Brushes, M-911-39; 1939. Soft grade Tientsin or Manchurian bristle, mixed with superior Hankow, Chungking, or Yunan stiff bristle, 6 1/2-oz. leather welting, extension style block, vulcanized rubber setting.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Roof Brushes (3-Knot); M-911-39; 1939. Good grey or black Tampico center, cased with pure Chinese bristle. Three knot roof type, hardwood block, seamless steel ferrules, setting, and wedging.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Tar Brushes, M-911-39; 1939. Uses grey Russian bristle, semi and stiff grade, ferrule, handle, setting, and construction.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Whitewash Brush, M-911-39. Good white Tampico fiber, staple set in finished whitewash block, with staff holes.

References.—Wire and fiber cleaning brushes, *see* 982.3; paint and stencil brushes, *see* 982.2; hair sweeping brushes, *see* 981.4.

982.6 CARBON BRUSHES

References.—Carbon brushes for electric motors, *see* 711.42.

982.9 MISCELLANEOUS BRUSHES

American Hospital Assn., 52-1. Hand Brush. Covers one grade and one class.

American Meat Institute. Standards for Packinghouse Supplies, Packs, and Equipment, 1928. Government Standard Stamping Brush. Of Chinese bristle for ink pad use, size of block, length of bristle, and number of rows.

Assn. of American Railroads, Operations and Maintenance Dept., Mechanical Div. Manual of Standard and Recommended Practice, 1942. Dye Brushes, M-911-39; 1939. Made from half Russian and half Indian bristle, set in hardwood block with strong brush wire, size of 42 brush, back of block glued and fastened with six screws.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification 247-49-S. Brush; Pastry.

U. S. Gov., Federal Specification H-B-291; 1930. Amendment 1; 1941. Brushes; Glue, Flat. Covers one type, two grades, and three sizes—Nos. 1, 2, and 3. Gives detail requirements for bristle, handle, ferrule, setting, width inside ferrule, depth and thickness of ferrule, thickness of brush inside ferrule, minimum weight of bristle in finished brush, minimum hold of bristle in brush, and length of bristle outside of brush; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking. Emergency Alternate Federal Specification E-H-B-291; 1942, (issued by Procurement Div., Treasury Dept., U. S. Gov.) substituted steel in lieu of nickeled brass, gave tolerance permitted in depth of ferrule; and changed the requirements for hard rubber.

U. S. Gov., Federal Specification H-B-301; 1930. Amendment 2; 1944. Brushes; Glue, Round. Covers one type, one grade, and three sizes—Nos. 1, 2, and 3. Gives requirements for stock, handle, ferrule, setting, comparison sample, diameter and depth of ferrule inside, minimum weight of bristle in finished brush, diameter of handle widest point in brush, bristle hold in ferrule, and length of bristle outside of ferrule; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking.

U. S. Gov., Federal Specification H-B-401; 1938. Brushes; Mucilage and Paste. Covers one grade, in two types—(I) brushes with collar and rim, (II) flat brushes without collar. Gives requirements for bristles, ferrules, handles, finish, dimensions for bristles, brushes, and handles; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment. Emergency Alternate Federal Specification E-H-B-401; 1942. substituted horsehair in lieu of bristles and steel in lieu of aluminum or other nonferrous metal; eliminated hard rubber; and changed requirements accordingly.

U. S. Gov., Federal Specification H-C-421; 1941. Cleaners; File, Combination (Brush and Card). For removing filings that have become clogged between file teeth. Gives requirements for design, wooden block, handle, wires, file card, packing, brush, scorer; methods of sampling, inspection, and tests; and requirements for packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 38 B 29a; 1943. Brushes; Seaming.

U. S. Gov., Treasury Dept., Procurement Div., 284A, 1942. Brushes; Seaming. Shall be of one type, grade, and size. Gives requirements for block, brush stock, stock, holes, dimensions, and tolerances; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Medical Dept. Specification 30-66; 1939. Brush; Weighted.

U. S. Gov., U. S. Army, Medical Dept. Specification 30-67; 1939. Brush; Bedpan.

References.—Dental brush wheels, *see* 915.10; hair sweeping brushes, *see* 981.4.

983. MOPS

American Hospital Assn., 34-109. Cotton Mops. Covers narrow and wide band types in six classes. Based on U. S. Gov., Federal Specifications T-M-561a.

American Hospital Assn., 34-112. Oval Shape Cotton Dry Mops Without Handles (Oil Treated and Untreated, for Walls, Ceilings, and Floors). Covers one type natural color cotton in three sizes—8-oz., 12-oz., and 14-oz. Based on U. S. Gov., Treasury Dept., Procurement Div., Specification 407A.

American Hospital Assn., 34-115. Oil-Treated Floor Mops With Handles (Triangular Shape). Covers one grade, type, and size. Based on U. S. Gov., Treasury Dept., Procurement Div. Specification 408A.

U. S. Gov., Federal Specification T-M-561a; 1938. Amendment 1; 1944. Mops; Cotton. Covers one grade in two types—(1) narrow band and (2) wide band; and in six classes—(A) 9 lb. per dozen, (B) 12 lb. per dozen, (C) 15 lb. per dozen, (D) 18 lb. per dozen, (E) 20 lb. per dozen, and (F) 24 lb. per dozen. Gives requirements for material and workmanship; detail requirements for each type; number of strings per mop, widths at center, and lengths; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 38M1; 1941. Mops; Graving and Pitch.

U. S. Gov., Treasury Dept., Procurement Div., No. 346; 1939. Mops; Cuspidor and Sanitary, Cotton. Only one type and grade of mop is covered, made of clean cotton, combed, and free from sizing or other loading materials, and so treated as to allow it to readily absorb liquids. Gives requirements for handles, length, mop, over-all length, and manner of securing mop to handle; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 407A; 1939. Mops; Dry, Cotton, Without Handles (Oil Treated and Untreated, for Walls, Ceilings, and Floors) (Oval Shape). Covers three weights—8 oz., 12 oz., and 14-oz., made of natural color cotton. Gives requirements for frame shape, handle clamp, oil, dimensions; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 408B; 1942. Mops; Floor, Oil Treated, With Handles (Triangular Shape). Covers one grade, type, and size.

Shall be made of clean cotton free from lint, sizing, or other loading materials. Gives requirements for mop yarn and colors, tape or band, frame, handle, ferrule, and dyes; method of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 571a; 1942. Swabs; Deck. Covers one type, grade, and class. Gives requirements for handle, shape, finish, dimensions, swab, cotton twine, substitute for marlin, and securing swab to handle: methods of sampling, inspection, and tests; and packaging, packing, and marking.

983.1 MOP STICKS

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS2-30; 1930. Mopsticks. This commercial standard is a minimum specification for mopsticks used in domestic, janitor, and like service. Gives general and detail requirements covering domestic and janitor sizes of mopsticks of the spring lever type and screw type; also requirements covering metal fixtures such as head, spring, and lever.

U.S. Gov., Federal Specification NN-H-101; 1934. Amendment 4; 1944. Handles; Mop. Covers one grade and three types—(I) screw type (malleable iron or pressed steel head), (II) spring-lever type (malleable iron or pressed steel head), and (III) alternate types. Gives requirements for material, kind of wood for stick, workmanship, stick, metal fixtures, bail, head, screw-pin, and finish; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Veterans Administration. Specification VA-G-520; 1933. Handles for Floor Mops.

983.2 MOPPING OUTFITS

American Hospital Assn., 34-106. Mopping Outfits. Covers two types in various styles and sizes. Based on U. S. Gov. Federal Specification RR-M-571.

U.S. Gov., Federal Specification RR-M-571; 1938. Amendment 2; 1944. Mopping Outfits. Covers two types—(I) wringers, light-duty, for use either with general utility buckets or without buckets; and (II) wringer and water container combinations. Gives requirements for material, workmanship, cadmium or zinc coating, water-containers, wringers, and details for each type class, style, and size; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 38S1c; 1944. Swabs; Deck.

U. S. Gov., Treasury Dept., Procurement Div., 534a; 1942. Buckets; Mopping Apparatus; Oval, Caster Mounted. This specification covers oval shaped buckets mounted on casters for use with hand operated mop wringers. Buckets furnished in four sizes—16, 26, 35, and 50 qt. Gives requirements for design, fabrication, seams, top rim, ears, bail, casters, dimensions, and thickness of metal; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 726; 1945. Swabs; Hand; Covers one type, grade, and class. Gives requirements for swab, cotton twine, construction, comparison sample, and length; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., U. S. Maritime Commission, Specification 42-MC-1a; 1941. Mopping Outfit; Mechanical. Type I—with galvanized pails; type II—with wooden pails; and there shall be but one grade. Gives requirements for workmanship, capacity, bails, ears, finish of mechanical parts, roller bridges, rollers, foot treadle, pivots, springs, foot brace, inspection, and method of test.

U. S. Gov., Veterans Administration. Specification VA-G-109e; 1937. Mopping Outfit.

984. SWEEPERS

U. S. Gov., Treasury Dept., Procurement Div., 524a; 1942. Sweepers; Carpet. Covers one type, one grade, and two sizes—(1) 13 in. and (2) 17 1/2 in. Gives requirements for metal finish, wood, wood finish, color, dimensions, case, driving wheels, brush unit, combs, dirt collector, pan release lever, bumper, handle, bail and handle socket, and performance; methods of sampling, inspection, and test; and packaging, packing, and marking.

990-999 MISCELLANEOUS ARTICLES

991. MATCHES

U. S. Gov., Federal Specification EE-M-101c; 1944. Matches; Safety (Wood in Boxes; Paper in Books). Covers one grade and two types—(I) wood (in boxes) and (II) paper (in books). Gives general requirements and detail requirements for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Veterans Administration. Specification VA-G-343a; 1944. Matches; Safety, in Books.

992. BUTTONS

U.S. Gov., Federal Specification V-B-871; 1934. Amendment 3; 1944. Buttons. Covers three types: (I) Collar, in two classes—(A) hard fiber and (B) plain wood; (II) sewing hole, in nine classes—(A) aluminum, (B) bone, (C) brass, (D) composition, (E) japanned iron, (F) vegetable ivory, (G) salt water pearl, (H) fresh water pearl, and (I) zinc; and (III) staple, in four classes—(A) composition, (B) vegetable ivory, (C) salt water pearl, and (D) fresh water pearl. Gives requirements for material and workmanship, shape, color, sizes, and details for each class; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Marine Corps Specification, 1943. Button; Honorable Discharge.

U. S. Gov., Marine Corps Specification, 1944. Buttons; Metal, for Officers' Uniforms.

U. S. Gov., Marine Corps Specification, 1944. Buttons; Metal, Uniform and Cap (Enlisted Men).

U. S. Gov., Marine Corps Specification, 1943. Buttons; Plastic, for Uniform and Cap (Enlisted Men).

U. S. Gov., Marine Corps Specification, 1943. Buttons; Sewing, Plastic.

U. S. Gov., Marine Corps Specification, 1938. Button; U. S. Marine Corps Reserve.

U. S. Gov., Navy Dept. Specification 71B3b; 1942. Buttons: Bronze, Eagle, Gilt, Anchor.

U. S. Gov., Navy Dept. Specification 71B4b; 1943. Buttons, Eagle, Gilt and Bronze, for Officers' Uniforms.

993. BREATHING AND DIVING APPARATUS

Industrial Hygiene Foundation of America, Inc. Preventive Engineering Series, Bulletin 2, Part 2; 1938. Use and Care of Respirators. Covers use of Respirators, and includes list of respiratory protective devices approved by U. S. Bureau of Mines.

National Safety Council. American Standards Assn., K13-1930. Code for Identification of Gas-Mask Canisters. Published as Bulletin 512 of Bureau of Labor Statistics, U. S. Dept. of Labor. Assigns definite colors to gas mask canister, dependent on kind of gas, smoke, or mist with which it is supposed to be used. For Gas Masks used in industrial plants, mines, rescue work, fire fighting, etc.

Society of Automotive Engineers. Aeronautical Recommended Practice, 171; 1944. Nomenclature, Aircraft Oxygen Equipment, Lists 45 terms alphabetically and defines them.

U. S. Gov., Army Air Forces. Specification 3165-A-1; 1944. Mask; Oxygen, Type A-13.

U. S. Gov., Army Air Forces. Specification 3166-1; 1944. Mask; Oxygen, Type A-7A.

U. S. Gov., Army Air Forces. Specification 40465A; 1944. Regulator; Diluter-Demand Oxygen, Type A-14, Pressure Breathing.

U. S. Gov., Army Air Forces. Specification 40466-1; 1945. Regulator; Diluter-Demand Oxygen, Type A-15.

U. S. Gov., Army Air Forces. Specification 40622A-1; 1944. Kit; Oxygen Mask Maintenance, Type Z-1.

U. S. Gov., Army Air Forces. Specification 40705-2; 1944. Valve; Mask Exhalation, Pressure Compensating.

U. S. Gov., Army-Navy Aeronautical Specification AN-O-134; 1944. Connection Assemblies; Demand Mask to Regulator Tube.

U. S. Gov., Army-Navy Aeronautical Specification AN-M-3; 1942. Masks; Oxygen.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-5; 1942. Regulators; Diluter-Demand Oxygen.

U. S. Gov., Army-Navy Aeronautical Specification AN-R-11; 1942. Regulator Assemblies; Demand Oxygen.

U. S. Gov., Army-Navy Aeronautical Specification AN-T-23a-1; 1944. Tube Assemblies; Oxygen, Mask to Regulator.

U. S. Gov., Dept. of Commerce, National Bureau of Standards, H 24; 1938. American Standards Assn., Z 2-1938. Standard Safety Code for the Protection of the Heads, Eyes, and Respiratory Organs. Protectors for Chipping, riveting, calking; scaling, grinding; exposure to dust and wind; babbitting; handling corrosive chemicals, dipping, brush coating; exposure to glare; oxyacetylene welding, furnace work; arc welding and cutting; exposure to dust fumes, mist, smokes, or other atmospheric particulate matter; abrasive blasting; exposure to irrespirable gases and vapors; and exposures to heavy falling objects. Operating rules and tests for protectors.

U. S. Gov., Navy Dept. Specification 12D1d; 1935. Diving Apparatus.

U. S. Gov., Treasury Dept., Procurement Div., 409D; 1943. Respirators; Dust (Non-Toxic), Mechanical-Filter. Shall be in one type and one grade and shall bear the approval of U. S. Bureau of Mines for protection against type A dusts. Gives requirements for rubber parts, metal parts, sterilization, weight, face piece, valves, filter unit, container, and filtering medium; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div. 519d; 1943. Masks; Gas. Hydrocyanic Acid (Hydrogen-Cyanide). Covers one grade, two types—(I) hose-connection carister and (II) direct-connection canister; and two classes—(A) with warning agent and (B) without warning agent. Intended for protection against hydrogen cyanide gas and shall bear the approval of the U. S. Bureau of Mines. Gives requirements for material, workmanship, rubber parts, metal parts, face piece, valves, hose, canister, carrying harness, and carrying case; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 556c; 1942. Respirators; Dust (Toxic and Non-Toxic), Mechanical-Filter. Covers one type and one grade intended for protection against free silica, asbestos, aluminum, cellulose, cement, charcoal, coal, coke, flour, gypsum, iron ore, limestone,,wood, lead, cadmium, arsenic, chromium, magnesium, selenium, vanadium, and their compounds. Gives requirements for rubber parts, metal parts, sterilization, total weight, face piece, valves, filter unit, container, and filtering medium; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., 557c; 1942. Respiratory; Supplied-Air. Covers—class A, with filter assembly holder; and class B, without filter assembly holder. Intended for use with air supplied by means of a hose line attached to a remote source. Gives requirements for rubber parts, metal parts, face piece, exhalation valve, breathing hose, filter assembly and air regulator, and filter assembly holder; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 623; 1943. Masks; Gas. Universal (Not for Purposes of Warfare). Covers one type and one grade. Intended for respiratory protection in air against acid gases, organic vapors, ammonia, carbon monoxide, smoke from ordinary fires, dust, fumes, mists, and fogs. Gives requirements for material, workmanship, rubber parts, metal parts, face piece, exhalation valve, checking harness, and carrying case; methods of inspection, sampling, and tests; and packaging, packing, and marking.

U. S. Gov., U. S. Army, Army Air Forces. Specification 94-3107; 1940. Mask; Oxygen, Type A-8.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-30C; 1941. Valve; Outlet, Gas-Mask.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-32B; 1930. Deflector; Rubber, Gas-Mask Facepiece.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-34A; 1928. Valve; Canister, Check.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-75C; 1941. Faceblank; Facepiece, Gas-Mask.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 20-84B; 1939. Disc; Inlet Valve, Canister.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-13C; 1938. Castings; Die, for Gas Masks.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-44A; 1933. Harness; Head, MII, Assembly.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-49; 1928. Bridge; Wire, Submarine Face Piece.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-52; 1928. Mask; Gas, Public Health Service, H.C.N.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-56; 1929. Mask; Gas, Ammonia.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-57; 1929. Mask; Gas, Fireman's.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-65; 1929. Mask; Gas, Oil Vapor.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-66; 1935. Facepiece; Service, M1A2.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-94; 1937. Facepiece; Diaphragm, MII, Elastic Type Head Harness.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-112; 1942. Diaphragm; Cellulose Acetate.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-114; 1942. Faceblank; Fully Molded, Army Optical Gas Mask.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-126; 1941. Faceblank; Service, Fully Molded.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-142; 1940. Facepiece; Gas-Mask, Noncombatant, MI.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-143; 1940. Mask; Gas, Noncombatant, MII.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-51-152; 1942. Fabric, Rubberized; Disc, Inlet Valve.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-24B; 1937. Canister; Gas-Mask, H.C.N., MI.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-26A; 1937. Canister; All Purpose, MI.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-52A; 1937. Canister; Ammonia, MI.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-57A; 1937. Canister; Gas-Mask, Oil-Vapor, MI.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-62; 1930. Canister; Submarine, Respirator, MIAI.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-52-72; 1937. Canister; Acid Vapor, MI.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-53-15; 1934. Carrier; MIIIA1, Gas Mask.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-54-98; 1939. Faceform; Gas Mask, MII.

U. S. Gov., U. S. Army, Chemical Warfare Service. Specification 97-101C; 1938. Facepiece; Service, MIAI.

U. S. Gov., U. S. Army, Medical Dept. Specification 10-2126A 1941. Tubes; Breathing.

994. PIPES AND SMOKERS' OUTFITS

American Hospital Assn., 34-139. Smoking Stands. Covers full and semi-rocking types.

U. S. Gov., Navy Dept. Specification 25R1a; 1944. Receivers; Ash, Tobacco.

U. S. Gov., Treasury Dept., Procurement Div., No. 348; 1939. Stands; Smoking. Covers two types—(I) full-rocking and (II) semi-rocking, and are constructed of metal. Gives requirements for tray, bowl, base, stem, snuffer-clips, finish, weight, and size; methods of sampling, inspection, and tests; and packaging, packing, and marking.

U. S. Gov., Treasury Dept., Procurement Div., No. 696; 1944. Trays; Ash. Shall be made of glass, thermosetting plastic, or metal. Gives requirements for material, workmanship, shape, dimensions, size, weight, design, finish, and details for glass, plastic, and metal trays; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

997. LAMPS AND ILLUMINATING DEVICES (EXCEPT ELECTRIC LAMPS)

997.1 OIL LAMPS, LANTERNS, TORCHES

American Society for Testing Materials, D 187-39; 1939. American Petroleum Institute Standard, 502-39. American Standards Assn., Z11.17-1939. Method of Test for Burning Quality of Kerosene Oils. For burning quality of ordinary kerosene used for illuminating purposes, description of standard brass Saybolt test lamp, Miller No. 2 burner, MacBeth-Evans No 514 pearl top chimney, detailed dimensions of burner, wick, balance and sight gage, and test procedure.

American Society for Testing Materials, D 219-36; 1936. American Petroleum Institute Standard, 503-36. American Standards Assn., Z11.19-1936. Method of Test for Burning Quality of Long-Time Burning Oil for Railway Use. For special kerosene oil used in railway semaphore signal lamps; includes standard semophore lamp; dimensions of burner; gray round felt wick and chimney; sight gage and test procedure.

American Society for Testing Materials, D 239-30; 1930. American Petroleum Institute Standard, 504-30. American Standards Assn., Z11.18-1930. Method of Test for Burning Quality of Mineral Seal Oil. For burning quality of special illuminating oil known as mineral seal oil, 300 oil, or mineral colza oil, used in railway coach lamps. Using Dressel standard No. 520 side lamp; dimensions of font, burner, chimney, and wick; sight gage and outline of procedure.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Signal Section. Manual of Recommended Practice. Specification 137-39; 1939. Oil Light Lamp. For railway signal service, interchangeable parts, detailed dimensional drawings, various types of lamps, size of lamp bails, method of tinning parts, japanning, lamp dics, wind velocity, and temperature test.

Assn. of American Railroads, Purchases and Stores Div. Hand Torch (Upright and Teapot Types), 1934. Gives dimensional requirements and illustrations for oil torches made of sheet steel.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Gasoline Lanterns, 1933. Covers pressure feed, heat generated, mantle-burner type, for use only on farms and similar locations. Excess temperature control, stability, tank capacity, general construction, air pumps, and testing requirements.

U. S. Gov., Army Air Forces. Specification No.40860; 1945. Torch; Roadside.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-225. Lantern; Gasoline.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-359. Torch; Liquid Gas.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Commercial Standard CS88-41; 1941. Liquid-Burning Flares. This standard covers the requirements and methods for construction, vibration and shock, weatherproof, reliability and life, and photometric tests of liquid-burning flares. Sponsored by Safety Equipment Manufacturers Assn.

U. S. Gov., Federal Specification RR-L-112; 1941. Amendment 1; 1944. Lanterns; Oil-Burning, Hand, Globe. Covers hand lanterns of four types—(I) cold blast; three classes—(A) large size, high globe, burn 45 hr.; (B) small size, short globe, burn 30 hr.; and (C) small size, short globe, burn 60 hr.; (II) cold blast, wire frame, short globe, burn 12 hr.; (III) hot blast, high globe, burn 30 hr.; and (IV) wire frame, short globe, burn 100 hr. Gives requirements for material, workmanship, condition, leakage, fount, burner, globe-lifting mechanism, fill opening and cap, bail, wick, globes, marking, and details for each type; methods of sampling, inspection, and tests; and packaging, packing, and marking for shipment.

U. S. Gov., Navy Dept. Specification 31B2b; 1934. Burners; (Chimneys; Wicks;) Running-Light, Oil-Burning.

U. S. Gov., Navy Dept. Specification 31L13e; 1943. Lanterns; Oil-Burning, Deck.

U. S. Gov., Navy Dept. Specification 31L15c; 1937. Lanterns; Oil-Burning, Boat-Signal.

U. S. Gov., Navy Dept. Specification 31L17a; 1934. Lights; Signal.

U. S. Gov., Navy Dept. Specification 31 L 19c; 1943. Lights; Oil-Burning, Masthead, Range-and-Towing, Battleship Size.

U. S. Gov., Navy Dept. Specification 31 L 20b; 1943. Lights; Running, Oil-Burning, Torpedo Boat-Destroyer, Masthead.

U. S. Gov., Navy Dept. Specification 31 L 21a; 1943. Lights; Running, Oil-Burning, Torpedo Boat-Destroyer, Side.

U. S. Gov., Navy Dept. Specification 31L25b; 1944. Lamps; Safety, Flame.

U. S. Gov., Navy Dept. Specification 41T22b; 1944. Torches; Oil, Portable, Suction.

U. S. Gov., Navy Dept. Specification 57L7; 1941. Lamps; Alcohol, Metal, with Shield.

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 29-95; 1940. Lantern; Gasoline, 2-Mantle, Commercial.

References.—Iron and steel sheets, *see* 604.2; brass sheets and plates, *see* 644.21; glass lantern globes and lamp chimneys, *see* 524; oil lamps for incubators, *see* 614.9.

997.2 GAS AND GAS APPLIANCES

American Gas Assn. American Standards Assn., Z21.2-1938. Listing Requirements for Flexible Gas Tubing. Performance requirements and methods of test for leakage, capacity, strength, flexibility, resistance to heat and freezing, elasticity and gripping power of rubber slip ends, drawing of standard hose end nozzle.

American Gas Assn. American Standards Assn., Z21.3-1940. Approval Requirements for Hotel and Restaurant Ranges and Unit Broilers, effective Jan. 1, 1941. Construction requirements for use with all gases. Performance requirements for use with natural and manufactured gases, liquefied petroleum gases, and butane-air gas.

American Gas Assn. American Standards Assn., Z21.5-1940. Approval Requirements for Clothes Dryers. For gas heated dryers of cabinet type and rack type, requirements on thicknesses of metal parts, dimensions of cocks, sizes of clothes rods, structural features of dryer, test requirements for burner operation, temperature limiting devices, pilot, heating capacity, drying efficiency, fire hazard, draft hoods, etc.

American Gas Assn. American Standards Assn., Z21.6-1932. Approval Requirements for Incinerators. Requirements on thicknesses of metal parts, materials and construction of parts, strength of incinerator, gas burner construction, test requirements for burner and pilot operation, incinerating efficiency, leakage, and fire hazard.

American Gas Assn. American Standards Assn., Z21.7-1932. Approval Requirements for Gas Heated Ironers. Construction requirements for burners, cocks, combustion chamber, thickness of metal, stability requirements, test requirements for burners operation, heat distribution, pressure distribution, explosion and fire hazards, ironer operation, and efficiency.

American Gas Assn. American Standards Assn., Z21.12-1937. Listing Requirements for Draft Hoods. Includes—part I, construction requirements; part II, performance requirements for use with gas converted central heating equipment; part III, performance requirements for use with gas water heaters and with gas converted water heating equipment; and appendix, definitions, dimensions for vertical draft and horizontal draft hoods.

American Gas Assn. American Standards Assn., Z21.18-1934. Listing Requirements for Domestic Gas Appliance Pressure Regulators. Represent minimum standards for the performance, safe operation, and substantial and durable construction of gas appliance accessories. Revisions to this Standard were issued by the American Gas Assn., effective June 15, 1935, and July 8, 1938.

American Gas Assn. American Standards Assn., Z21.19-1942. Approval Requirements for Refrigerators Using

Gas Fuel. Represents basic standards for safe operation, substantial and durable construction, and acceptable performance for refrigerators using gas fuel. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; and appendix, definitions.

American Gas Assn. American Standards Assn., Z21.20-1940. Listing Requirements for Automatic Pilots. Includes—part I, construction requirements for use with all gases; part II, performance requirements for use with natural and manufactured gases; part III, performance requirements for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; and appendix, definitions.

American Gas Assn. American Standards Assn., Z21.21-1935. Listing Requirements for Automatic Main Gas-Control Valves. Represent minimum standards for the performance, safe operation, and substantial and durable construction of gas appliance accessories.

American Gas Assn. American Standards Assn., Z21.22-1935. Listing Requirements for Relief and Automatic Gas Shut-Off Valves for Use on Water Heating Systems. Includes construction requirements; performance requirements on pressure relief valves, pressure relief elements of combination valves, temperature relief valves, temperature relief elements of combination valves, vacuum relief valves, and vacuum relief elements of combination valves; definitions; and arrangement of apparatus for testing temperature relief valves.

American Gas Assn. American Standards Assn., Z21.23-1940. Listing Requirements for Gas Appliance Thermostats. Includes construction requirements; performance requirements for liquid immersion, gaseous immersion, and surface contact thermostats; and definitions.

American Gas Assn. American Standards Assn., Z21.27-1940. Approval Requirements for Hotel and Restaurant Deep Fat Fryers, effective Jan. 1, 1941. Construction and installation requirements for use with all gases. Performance requirements for use with natural and manufactured gases; liquefied petroleum gases and butane-air gas.

American Gas Assn. American Standards Assn., Z 21.31-1941. Approval requirements for Gas Counter Appliances. Represents basic standards for safe operation, substantial and durable construction, and acceptable performance for gas counter appliances. Includes—part I, construction requirements for use with all gases; part II, performance requirements, coffee brewers and coffee urns for use with natural and manufactured gases; part III, performance requirements, coffee brewers and urns for use with liquefied petroleum gases; part IV, performance requirements for use with butane-air gas; part V, performance requirements, food and dish warmers for use with natural and manufactured gases; part VI, performance requirements, food and dish warmers for use with liquefied petroleum gases; part VII, performance requirements, food and dish warmers for use with butane-air gas; part VIII, performance requirements, gas waffle bakers for use with natural and manufactured gases; part IX, performance requirements, gas waffle bakers for use with liquefied petroleum gases; part X, performance requirements, gas waffle bakers for use with butane-air gas; part XI, performance requirements, hot water immersion sterilizers for use with natural or manufactured gases; part XII, performance requirements, hot water immersion sterilizers for use with liquefied petroleum gases; part XIII, performance requirements, hot water immersion sterilizers for use with butane-air gas; part XIV, performance requirements, commercial hot plates and griddles for use with natural and manufactured gases; part XV, performance requirements, commercial hot plates and griddles for use with liquefied petroleum gases; part XVI, performance requirements, commercial hot plates and griddles for use with butane-air gas; and appendix, definitions.

American Gas Assn. American Standards Assn., Z21.32-1942. Listing Requirements for Gas Appliance Connectors of Flexible Metal Tubing and Fittings, effective Jan. 1, 1943. These requirements apply to gas appliance connectors consisting of a suitable length of braided or nonbraided flexible all-metal tubing of 1/2 to 1 in. nominal internal diameter and having a fitting at each end provided with standard pipe threads for connection to gas appliance and house piping. Includes construction and performance requirements and illustration of bending test.

American Gas Assn. American Standards Assn., Z21.33-1942. Requirements for Installation of Gas-Burning Equipment in Power Boilers, effective Jan. 1, 1943. Gives requirements for boiler room ventilation, accessibility for cleaning and inspection, flues anc flue connections, installation of burners and controls, gas piping and meters, and inspections anc tests.

American Gas Assn. Requirements for Official Markin of Approved Gas Appliances and Listed Accessories 1940. These requirements are designed to protec the public by providing a means of identificatio of those gas appliances and gas appliance accessories which have been tested and certified in accordance with national basic standards for safety, efficiency, and durability. Gives details coverin laboratories approval seal and laboratories listin symbol; and appendix.

National Board of Fire Underwriters. Liquefied Petrc leum Gases, No. 58; 1940. Standards for the desig installation, and construction of containers an pertinent equipment for storage and handling c liquefied petroleum gas. Gives basic rules and details for systems utilizing containers constructe in accordance with Interstate Commerce Commissic specifications, systems utilizing storage contair ers other than those constructed in accordance wit I.C.C. specifications, containers and pertinen equipment for tank truck and trailers for tl transportation of liquefied petroleum gases, cor tainers and pertinent equipment for utilizing lic uefied petroleum gas as a motor fuel, and appendice

National Fire Protection Assn. National Fire Cod for Flammable Liquids, Gases, Chemicals, and Expl sives, 1943. City Gas. Standards for the installation, maintenance and use of piping, appliances, and fittings for city gas. Covers general requirements, inspections and tests, services and meters, piping, valves and fittings, appliances, turning gas on and off, and appendix.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Fire-Hazard Properties of Flammable Liquids, Gases, and Volatile Solids. Gives tables showing flash point, ignition temperature, explosive limits, specific gravity, vapor density, boiling point, Underwriters' Laboratories classification, and extinguishing agents.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Odorization of Gas. Odorization as a means for the detection of the escape of gas. Covers odorant characteristics, quantity of warning agent required, method of introducing odorants, value of odorization, odorization of liquefied petroleum gases, and conclusion.

U. S. Gov., Dept. of Commerce, National Bureau of Standards. Circular C405; 1934. Standards for Gas Service. This circular covers recommended rules for the guidance or use of state and municipal officials who may have local administrative or legislative authority, and for officers and employees of gas companies who are responsible for the maintenance of good service. This circular gives detailed information on heating values, composition of the gas, pressure, meters and meter testing, general service requirements, enforcement of technical regulations, proposed regulations, composition of gases of various types and their source and methods of manufacture, and summary of rules in effect in various states.

References.—Brass pipe and tubing, *see* 645.23, 645.24; iron pipe, *see* 607.1, 607.2, 607.3; insulating joints for combination electric and gas fixtures, *see* 716.32; electric fixtures, *see* 716.32; gas stoves, gas house heating furnaces, *see* 614.2, 614.4; gas producers, *see* 756.

997.3 GLOBES, SHADES, LAMP CHIMNEYS

References.—Glass lantern globes and lamp chimneys, *see* 524.

997.4 GASOLINE VAPOR MACHINES, SYSTEMS, AND LAMPS

National Board of Fire Underwriters. Gasoline Vapor Gas Machines, No. 53; 1926. Regulation for installation, maintenance, and use of gas machines, lamps, and systems. Includes five types, outside and inside carburetors, systems with outside tanks and inside generators, gasoline, lamps, etc. Requirements for carburetor, pressure supply, mixer, pressure regulator, piping, regular care and attendance, stability of lamps, capacity, construction, and location of tanks.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Gasoline Vapor Lamps and Systems. Standards for the installation, maintenance and use of gasoline vapor gas machines, lamps and systems. Covers requirements for carburetors, pressure supply, mixer, regulator, piping, tanks, and gives regulations for installation, maintenance, and use.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Liquefied Petroleum Gases. Standards for the design, installation and construction of containers, and pertinent equipment for the storage and handling of liquefied petroleum gases. Covers application of rules, basic rules, systems utilizing I.C.C. containers, systems utilizing containers other than I.C.C., tank trucks for liquefied petroleum gases, liquefied petroleum gas as a motor fuel, storage of containers not installed for use at final utilization point, and required sizes of safety valves for containers.

997.5 ACETYLENE EQUIPMENT AND LAMPS

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 11.80; 1938. Acetylene and Its Generation. Safeguards for Industrial Installations. Includes recommendations for generator house of fire-resistive construction and for three types of generators.

Associated Factory Mutual Fire Insurance Companies. Factory Mutual Bulletin of Loss Prevention, 11.82; 1938. Acetylene Piping Systems. Standards for Safe Industrial Distribution. Includes recommendations for materials, inside and outside piping, drainage, joints, valves, meters, protection, and testing.

National Board of Fire Underwriters. Acetylene Equipment for Lighting, Heating, and Cooking, No. 50; 1930. Covers six classes of equipment such as stationary, portable, dissolved acetylene, etc., for use in or about buildings; requirements on location of generator, details for outside generator house, capacity of piping, gas cylinders, flood lights, installation, operation, and storage of calcium carbide.

National Fire Protection Assn. National Fire Codes for Flammable Liquids, Gases, Chemicals, and Explosives, 1943. Acetylene for Lighting, Heating, and Cooking. Covers general precautions, stationary apparatus for outside and for inside installation, semiportable apparatus, dissolved acetylene under pressure, portable apparatus for lighting, and storage of calcium carbide.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Acetylene Generators for Lighting, 1926. Covers requirements for construction and performance of stationary automatic and nonautomatic, semiportable automatic and portable, for inside and outside installation and central station service; also dissolved acetylene in cylinders under pressure and portable table lamps. Includes rating, marking, operation, materials, carbide holder, feed mechanism, gas holder, piping, relief valves, purifiers, air mixtures, pressure regulators, water supply, recharging, controls, etc.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Portable Automatic Acetylene Generators for Oxy-Acetylene Welding and Cutting Systems, 1928. Machine for producing acetylene from calcium carbide, low, medium, and high pressure systems; requirements as to capacity rating and marking, operation, materials, assembly, carbide and gas holders, feed mechanism, relief valves, purifiers, flash-back checks, and stability.

Underwriters' Laboratories, Inc. Standard for Construction and Performance of Stationary Automatic

Acetylene Generators for Oxy-Acetylene Welding and Cutting Systems, 1928. Covers equipment for low, medium, and high pressure generation from calcium carbide; capacity rating and marking, operation, materials, construction, condensation, holder, feed mechanism, piping, flash-back check, etc.

U. S. Gov., Army Air Forces. Specification 40478-A (1); 1944. Generator; Portable, Acetylene.

References.—Acetylene storage cylinders, *see* 956.1; acetylene headlamps for automobiles, *see* 722.33; calcium carbide, *see* 833.1.

997.6 MINERS' LAMPS AND GAS DETECTORS

References.—Electric miners lamps and gas detectors, *see* 716.13, 716.17.

998. SIGNS AND SIGNBOARDS

American Assn. of State Highway Officials, Institute of Traffic Engineers, and National Conference on Street and Highway Safety. Prepared with advice and assistance of the War Dept. and Office of Civilian Defense. War Emergency Edition, 1942. Manual on Uniform Traffic Control Devices of Streets and Highway. Covers definitions, classification, legal authority, application, design, location and markings, and signals. Also covers safety zones and traffic islands.

American Railway Engineering Assn. Construction and Maintenance Section, Assn. of American Railroads. Manual for Railway Engineering, 1939. Signs. Gives roadway signs required, principles of design and rules for use, and economy of various materials.

Assn. of American Railroads. Bulletin 3; 1942. American Standards Assn., D 8.1-1943. Railroad Highway Grade Crossing Protection. Recommended standards and practices for new installation of railroad-highway grade crossing signs, signals, and automatic gates. Drawings for grade crossing signs, flashing light type and wig-wag type signals, automatic gates, and auxiliary signs.

National Safety Council. American Standards Assn., Z35.1-1941. Specifications for Industrial Accident Prevention Signs. Requirements on purposes, colors, and design with appendices on uses, wordings, maintenance, design sizes, sizes of signs and sign lettering, construction, material, finishes and locations.

Outdoor Advertising Assn. of America, Inc. Standard Outdoor Advertising Structures, 1939. Outdoor advertising structures are standardized giving uniform units of display. Gives diagrams, dimensions, and colors for standard poster panel and for painted bulletins, including streamliner bulletin, modernistic city suburban bulletin, standard city and suburban bulletin, standard roof bulletin, standard store bulletin, special highway bulletin, standard junior highway bulletin, standard highway and railroad bulletin, and standard metropolitan highway or railroad bulletin.

U. S. Gov., Dept. of Agriculture, Forest Service. Specifications for Board; Fire-Danger.

U. S. Gov., Dept. of Agriculture, Forest Service. Specification MSF-327. Signs; Fire-Camp, Directional.

References.—Electric signs, *see* 716.31; iron and steel sheets, *see* 604.2, 604.3; zinc coatings on sheets, *see* 604.3; yard lumber, structural timbers, *see* 402.4, 412; sheet steel, *see* 619.2.

999. MISCELLANEOUS MANUFACTURED ARTICLES

U. S. Gov., U. S. Army, Quartermaster Corps. Specification 34-22; 1942. Appointment; Ecclesiastical.

DIRECTIONS FOR OBTAINING COPIES OF SPECIFICATIONS

Copies of specifications issued by technical and trade associations may be obtained directly from the association. A list of these associations, with the addresses of their secretaries, is given below.

Specifications of the Federal Specifications Executive Committee having alphabetical designations, such as JJJ-S-351, may be obtained by purchase from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. For those specifications with numerical designations only, inquiry should be made of the Federal Specifications Executive Committee, Procurement Division, Treasury Department, Washington 25, D. C.

Information on method of procurement of other specifications issued by the various bureaus and agencies of the several departments or establishments of the Federal Government can best be obtained directly from the Washington, D. C., headquarters of the bureaus and agencies concerned.

In making inquiries concerning specifications, care should be taken to give both the title and designating number of the specification. In some cases the specification may be a part of some "manual" and not have any identifying number. In these cases the title of the manual or other publication is usually stated in the Directory immediately following the name of the organization which issues the specification.

Some of the specifications listed in the Directory will become obsolete in a relatively short time because revised specifications will supersede them. However, the information that will be obtained from the Directory will, in part at least, be currently up to date. It is understood that when an issuing agency receives an order for a specification referred to in the Directory, it will supply its current specification unless requested specifically to deliver specification which has been superseded.

NAMES AND ADDRESSES OF STANDARDIZING AGENCIES

Below are listed the trade associations, technical societies, and other standardizing agencies whose specifications and standards will be found listed in the Directory of Commodity Specifications. The numbers appearing after each organization refer to the group classifications in the body of the Directory under which that individual organization's specifications have been listed.

Abrasive Grain Association, Harry B. Lindsay, secretary, 27 Elm Street, Worcester, Mass. 541.0; 891.

Acoustical Society of America, Wallace Waterfall, secretary, 50th Floor, 350 Fifth Avenue, New York 1, N.Y. 296.4; 718.7; 719.93; 919.9.

Aeronautical Chamber of Commerce of America, Inc., Shoreham Building, Washington, D. C. 478.32; 604.0; 607.4; 608.2; 608.31; 608.4; 608.6; 622.1; 631.22; 631.34; 631.35; 631.42; 631.6; 692.3; 695.2; 714.41; 715.11; 715.35; 719.99; 724.20; 724.22; 724.25; 724.29.

Agricultural Insecticide & Fungicide Association, L. S. Hitchner, executive secretary, 285 Madison Avenue, New York, N.Y. 881.0; 881.21; 881.23.

Air Conditioning and Refrigerating Machinery Association, William B. Henderson, executive vice president, Southern Building, Washington, D. C. 425.2; 472.93; 473.3; 518.59; 607.3; 607.4; 622.1; 631.22; 631.34; 631.35; 631.42; 785.1; 791.2; 792.0; 792.2; 792.3.

Aluminum Research Institute, R.D.T. Hollowell, secretary, 308 West Washington Street, Chicago, Ill. 631.0.

Amateur Athletic Union of the United States, Daniel J. Ferris, secretary, 233 Broadway, New York 7, N.Y. 646.59; 662.; 663.; 943.1; 943.94; 943.97.

American Association for the Advancement of Science, Otis W. Caldwell, general secretary; F. R. Moulton, permanent secretary, Smithsonian Institution Building, Washington, D. C. 700.; 706.0; 718.40; 718.5; 719.63; 724.0; 910.

American Association of Cereal Chemists, Oscar Skovholt, president, c/o Quality Bakers of America, 120 West 42nd St., New York 18, N.Y. 100.0.

American Association of Medical Milk Commissions (Inc.), E. P. Brown, secretary, 1265 Broadway, New York, N.Y. 021.1; 021.6.

American Association of Motor Vehicle Administrators, L. S. Harris, executive director, Woodward Building, Washington, D. C. 722.32; 722.33; 722.35; 722.36; 723.0.

American Association of Nurserymen, Richard P. White, executive secretary, 636 Southern Building, Washington, D. C. 259.

American Association of Port Authorities, Tiley S. McChesney, secretary, 2223 Short Street, New Orleans, La. 725.40.

American Association of State Highway Officials, Hal H. Hale, secretary, National Press Building, Washington, D. C. 208.93; 211.1; 319.99; 400.42; 401.40; 401.49; 402.3; 412.1; 412.2; 412.9; 425.2; 429.9; 473.5; 500.; 502.0; 502.2; 503.0; 503.2; 503.3; 504.0; 505.0; 505.13; 505.14; 505.15; 505.16; 505.19; 505.20; 505.30; 505.31; 505.32; 505.33; 505.35; 505.36; 510.; 511.70; 511.71; 512.10; 512.11; 512.12; 512.13; 512.14; 512.15; 512.16; 512.2; 516.0; 516.11; 516.3; 518.10; 518.22; 518.30; 518.34; 518.35; 518.37; 518.41; 518.42; 518.46; 518.60; 518.61; 518.62; 518.67; 618.81; 518.82; 518.83; 518.89; 518.9; 531.5; 534.10; 534.11; 534.21; 594.; 600.1; 600.3; 603.1; 603.21; 603.41; 603.42; 604.32; 605.0; 605.11; 605.12; 605.19; 605.21; 605.25; 607.11; 607.3; 607.5; 608.4;

611.18; 621.21; 621.22; 621.24; 621.26; 621.32; 821.33; 622.5; 641.11; 641.21; 643.7; 645.3; 648.52; 651.1; 683.2; 718.5; 801.3; 840.1; 842.63; 843.61; 843.7; 844.61; 844.67; 847.1; 848.12; 848.7; 918.9; 919.9; 998.

American Association of Textile Chemists and Colorists Harold C. Chapin, secretary, c/o Lowell Textile Institute, Lowell, Mass. 300.4; 392.4; 770.; 803.10; 830.

American Automobile Association, Russell E. Singer, general manager, Pennsylvania Avenue at Seventeenth Street, Washington, D. C. 716.12; 722.32; 722.95.

American Bakers Association, Tom Smith, secretary, 105 West Adams St., Chicago 3, Ill. 108.1; 612.20; 612.3; 681.41; 786.

American Bankers Association, Harold Stonier, exec. mgr., 22 E. 40th Street New York City. 489.

American Bleached Shellac Manufacturers Association, Inc., Paul W. Fisher, executive secretary, 127 Maiden Lane, New York, N.Y. 846.11; 846.62.

American Boiler Manufacturers Association and Affiliated Industries, A. C. Baker, secretary, 264 Rockefeller Building, Cleveland, Ohio. 501.0; 703.0.

American Bottlers of Carbonated Beverages, John J. Riley, secretary, 1128 - 16th St. N.W., Washington, D. C. 176.0; 953.36; 955.1.

American Bowling Congress, J. H. Bruning, 2200 N. Third Street, Milwaukee 12, Wisconsin. 429.9; 943.1.

American Brush Manufacturers Association, George A. Fernley, secretary, 505 Arch Street, Philadelphia, Pa. 981.0; 982.2; 982.3.

American Bureau of Shipping, J. W. Cantillion, secretary, 47 Beaver Street, New York 4, N.Y. 603.1; 603.21; 603.23; 603.42; 603.50; 604.11; 604.13; 605.14; 605.15; 607.0; 607.3; 607.4; 608.4; 611.0; 611.49; 842.23; 642.24; 645.23; 645.24; 646.41; 700.; 701.0; 701.2; 703.1; 703.2; 704.1; 705.7; 710.; 725.40; 725.41; 725.42; 755.0; 767.; 785.0; 958.1; 970.

American Butter Institute, N. W. Hepburn, executive secretary, 110 N. Franklin Street, Chicago, Ill. 951.72.

American Ceramic Society, Inc., Ross C. Purdy, general secretary, 2525 North High Street, Columbus, Ohio. 511.2; 512.12; 517.2; 520.; 531.0; 531.6; 534.10; 534.12; 546.; 594.; 918.0.

American Chemical Society, Charles L. Parsons, secretary, 1155 - 16th Street N.W., Washington, D. C. 093.7; 142.0; 143.0; 471.2; 499.; 503.1; 532.21; 652.0; 801.1; 801.2; 801.8; 802.1; 802.2; 810.; 815.1; 815.2; 821.1; 821.2; 821.3; 821.4; 821.5; 821.6; 821.7; 821.9; 822.1; 822.4; 823.; 831.1; 831.3; 831.4; 831.5; 831.6; 831.7; 831.9; 832.3; 832.4; 833.2; 833.3; 834.1; 834.2; 834.3; 834.4; 834.5; 834.8; 834.9; 835.1; 835.2; 835.4; 835.5; 835.8; 837.1; 837.2; 838.2; 839.1; 839.32; 839.33; 839.34; 839.35; 839.37; 839.38; 839.39; 839.6; 839.7; 839.9; 871.0; 882.; 891.; 918.1; 918.2; 918.3; 918.4; 918.5; 918.6; 918.7; 918.9.

American College of Surgeons, 40 East Eire Street, Chicago, Ill. 398.34; 808.2; 622.9; 915.0; 915.58.

American Concrete Institute, Harvey Whipple, secretary, 7400 Second Boulevard, Detroit, Mich. 516.0; 516.4; 605.25; 959.3.

American Council on Education, George F. Zook, president, 744 Jackson Place, Washington, D. C. 437.; 613.3; 613.6.

American Cranberry Exchange, Inc., C. M. Chaney, secretary, 90 West Broadway, New York, N.Y. 132.11.

American Dental Association, Harry B. Pinney, secretary, 212 East Superior Street, Chicago 11, Ill. 204.4; 652.; 882.; 691.1; 915.10; 915.12; 915.19.

American Dental Trade Association, George A. Lilly, managing director, 1010 Vermont Avenue, N.W., Washington, D. C. 204.4; 915.10.

American Drug Manufacturers Association, Carson P. Frailey, executive vice president and secretary, 506 Albee Building, Washington, D. C. 810.

American Dry Milk Institute, Inc., Roud McCann, director, 221 North La Salle Street, Chicago, 1, Ill. 021.7.

American Electro-Platers' Society, W. J. R. Kennedy, executive secretary, 93 Oak Grove Avenue, Springfield, Mass. 600.3; 805.22; 656.0; 658.1.

American Foundrymen's Association (Inc.), R. E. Kennedy, secretary, 222 West Adams Street, Chicago 8, Ill. 429.9; 510.; 512.10; 512.12; 518.51; 541.0; 543.12; 574.; 643.4; 645.21; 646.0; 646.11; 648.4; 600.5; 811.18; 631.11; 643.0; 643.2; 682.; 683.1; 892.1; 892.2; 692.3; 695.; 711.24; 765.; 768.; 789.; 791.; 791.1; 792.0; 793.2.

American Gas Association, Kurwin R. Boyes, secretary, 420 Lexington Avenue, New York 17, N.Y. *also* Albee Building, Washington, D.C. 202.31; 503.3; 600.6; 607.0; 607.10; 607.12; 607.8; 607.7; 614.0; 614.2; 614.4; 814.9; 703.1; 787.; 915.27; 915.28; 915.30; 915.34; 915.35; 915.39; 915.41; 915.42; 915.45; 915.48; 915.47; 915.51; 915.52; 915.58; 918.3; 918.7; 918.9; 919.81; 919.83; 919.89; 931.1; 933.1; 933.9; 952.14; 952.19; 953.2; 955.1; 955.6; 957.2; 959.1; 973.2; 973.3; 981.0; 981.2; 981.4; 981.5; 981.61; 981.62; 982.2; 982.3; 982.9; 983.; 983.2; 994.; 997.2.

American Gear Manufacturers Association, Newbold C. Goin, executive secretary, Empire Bldg., Pittsburgh 22, Pa. 504.0; 600.0; 808.52; 811.11; 811.50; 611.55; 645.21; 646.41; 705.3; 754.; 765.; 788.0; 844.1.

American Gem Society, Robert M. Shipley, executive director, 541 South Alexandria Avenue, Los Angeles 5, Calif. 881.; 882.; 883.

American Gum Importers Association, Inc., George T. Hawxhurst, secretary, 380 Furman Street, Brooklyn, N.Y. 217.; 848.8.

American Home Economics Association, Miss Lelia M. Massey, executive secretary, 820 Mills Building, Washington 6, D. C. 310.0; 368.0.

American Honey Institute, Harriett M. Grace, director, Commercial Bank Bldg., Madison, Wisconsin. 522.; 959.1.

American Hospital Assn., Bert W. Caldwell, M.D., executive secretary, 18 East Division Street, Chicago, Ill. 043.3; 066.7; 092.1; 108.1; 109.6; 109.9; 142.95; 202.41; 204.11; 204.12; 204.13; 204.21; 204.23; 204.25; 204.26; 204.31; 204.33; 204.4; 204.51; 204.52; 204.53; 204.54; 205.55; 204.8; 204.92; 204.93; 204.96; 206.1; 209.5; 211.3; 281.; 293.; 301.4; 302.46; 303.1; 303.5; 303.6; 303.93; 304.2; 304.3; 304.4; 304.5; 304.8; 304.71; 304.8; 304.9; 304.91; 304.92; 304.93; 304.94; 306.12; 306.17; 306.16; 306.19; 306.22; 308.31; 308.1; 308.5; 309.3; 311.1; 311.3; 311.4; 311.7; 311.92; 312.2; 312.3; 315.0; 315.11; 315.14; 315.2; 315.31; 315.33; 315.4; 315.5; 316.1; 317.8; 319.3; 319.4; 319.7; 319.97; 319.99; 333.3; 333.9; 339.3; 339.53; 382.1; 365.98; 366.3; 369.21; 373.2; 391.; 392.2; 392.23; 392.6; 394.4; 395.1; 397.0; 396.21; 396.31; 423.3; 425.1; 429.4; 434.; 471.3; 472.93; 473.3; 474.2; 474.3; 474.9; 475.74; 478.31; 476.32; 477.3; 477.4; 477.5; 476.11; 478.13; 479.2; 494.; 497.1; 503.4; 514.2; 514.61; 516.58; 516.59; 528.3; 532.1; 532.21; 532.23; 612.14; 812.21; 612.22; 812.23; 813.1; 813.5; 813.7; 613.9; 815.9; 617.41; 817.79; 817.9; 619.9; 822.9; 831.9; 642.4; 645.39; 645.9; 646.2; 654.59; 656.7; 691.2; 707.44; 709.; 711.23; 714.21; 717.1; 717.2; 717.3; 719.92; 767.; 793.5; 803.11; 603.4; 834.4; 834.7; 834.6; 834.9; 839.1; 840.6; 843.39; 843.81; 643.62; 646.32; 847.1; 846.11; 848.12; 646.8; 871.0; 671.11; 671.12; 671.13; 671.15; 871.21; 871.22; 671.23; 871.27; 871.9; 661.17; 861.19; 861.2; 861.9; 691.; 893.4; 893.5; 914.3; 915.22; 915.23; 915.25; 915.27; 915.26; 915.32; 915.34; 915.35; 915.39; 915.41; 915.42; 915.45; 915.48; 915.47; 915.51; 915.52; 915.58; 916.3; 916.5; 916.8; 918.7; 916.9; 919.81; 919.63; 919.69. 931.1; 933.1; 933.9; 952.14; 952.19; 953.2; 955.1; 955.8; 957.2; 959.1; 973.2; 973.3; 981.1; 981.2; 961.4; 981.5; 981.81; 962.2; 982.3; 982.9; 983.; 983.2; 994.

American Hot Dip Galvanizers Association, Inc., Stuart J. Swenson, secretary, 1611 First National Bank Building, Pittsburgh, Pa. 600.3; 605.22.

American Hotel Association, Thomas D. Green, executive director, 221 West Fifty-seventh Street, New York 19, N.Y. 489.; 532.1; 871.0.

American Institute of Architects, Department of Technical Services, Theodore Irving Coe, technical secretary, 1741 New York Avenue, Washington 8, D.C. 514.3; 518.50; 532.22; 805.0; 615.42; 718.30; 745.2; 745.3; 745.4.

American Institute of Bolt, Nut, and Rivet Manufacturers, Herman H. Lind, president, 1550 Hanna Building, Cleveland, Ohio. 606.0; 806.2; 608.31; 608.32; 806.4; 815.42; 950.

American Institute of Chemical Engineers, S. L. Tyler, executive secretary, Chemists Building, 50 East Forty-first Street, New York, N.Y. 910.

American Institute of Electrical Engineers, H. E. Farrer, secretary standards committee, 33 West Thirty-ninth Street, New York 16, N.Y. 209.7; 532.22; 631.32; 700.; 705.4; 706.0; 710.; 711.10; 711.11; 711.12; 711.20; 711.21; 711.22; 711.3; 712.2; 713.1; 713.2; 713.4; 713.5; 714.11; 714.33; 714.42; 714.51; 714.52; 715.21; 715.40; 715.41; 715.43; 715.44; 715.50; 715.51; 718.2; 718.39; 717.1; 716.0; 716.32; 716.39; 716.40; 716.42; 716.63; 718.64; 718.66; 716.89; 716.7; 719.59; 719.63; 719.94; 724.0; 725.42; 726.1; 744.2; 787.; 910.; 919.3; 935.

American Institute of Homeopathy, E. B. Junkermann, recording secretary, 260 Madison Avenue, New York, N.Y. 042.2; 097.; 152.1; 153.1; 154.13; 155.4; 181.7; 212.; 217.; 221.; 222.; 281.; 501.8; 571.; 574.; 593.; 631.0; 852.0; 653.1; 681.; 682.; 881.1; 691.1; 601.3; 801.4; 602.1; 602.2; 803.11; 803.14; 603.29; 610.; 611.; 613.1; 613.2; 613.9; 614.2; 816.13; 618.15; 816.16; 818.17; 818.18; 618.19; 818.25; 616.29; 618.32; 616.35; 818.38; 616.39; 816.43; 818.45; 616.49; 816.51; 618.53; 618.54; 816.55; 616.57; 818.59; 616.65; 818.88; 818.67; 616.88; 816.73; 816.77; 616.79; 616.61; 816.82; 818.83; 616.64; 616.65; 818.86; 616.67; 616.69; 616.91; 816.92; 818.99; 617.18; 817.17; 816.79; 818.93; 619.1; 819.4; 619.79; 619.9; 621.1; 821.2; 621.3; 821.4; 821.5; 821.8; 621.7; 621.9; 622.4; 623.; 631.1; 831.3; 831.4; 631.5; 631.6; 631.9; 632.1; 832.2; 632.4; 833.2; 833.3; 833.5; 833.9; 834.2; 834.3; 834.4; 634.6; 834.9; 835.1; 835.2; 635.7; 835.6; 838.3; 838.9; 836.1; 836.2; 639.31; 839.32; 839.33; 839.34; 839.35; 639.36; 639.37; 839.36; 839.39; 839.6; 839.9.

American Institute of Laundering, George H. Johnson, general manager, Joliet, Ill. 310.0; 315.0; 319.90; 369.20; 370.0; 373.0; 375.0; 375.2; 397.0; 397.10; 397.11; 787.

American Institute of Mining & Metallurgical Engineers, A. B. Parsons, secretary, 29 West Thirty-ninth Street, New York, N.Y. 750.

American Institute of Steel Construction, V. G. Iden, secretary, 101 Park Avenue, New York 17, N.Y. 604.20; 805.0; 605.11; 605.12; 605.20; 805.22; 607.4; 621.33; 787.

American Iron and Steel Institute, Charles M. Parker, secretary, 350 Fifth Avenue, New York 1, N.Y. 600.1; 600.3; 600.5; 601.20; 602.2; 803.0; 603.20; 803.21; 603.23; 603.24; 603.40; 603.41; 604.0; 604.10; 604.20; 604.22; 604.31; 604.32; 605.0; 605.1; 605.25; 608.0; 806.1; 606.2; 608.4; 608.5; 607.4; 806.11; 611.0; 611.51; 611.52; 611.53; 621.11; 621.20; 621.21; 821.22; 621.23; 821.27; 621.28; 621.30; 621.31; 621.32; 621.33; 622.3; 622.6; 631.0; 653.1; 654.0; 656.0; 656.1; 950.; 954.36; 959.6.

American Leather Belting Association, E. R. Rath, executive manager, 53 Park Row, New York, N.Y. 066.0.

American Leather Chemists Association, B. M. Blair, executive secretary, 143 West Twentieth Street, New York, N.Y. 019.9; 040.; 060.; 161.9; 231.; 502.0; 504.0; 504.40; 517.2; 809.1; 821.6; 621.7; 621.9; 831.4; 634.3; 834.4; 834.5; 834.8; 834.9; 838.2; 839.39; 671.0.

American Lighting Equipment Association, J. W. Milford, secretary-treasurer, 11 West Forty-second Street, New York 18, N.Y. 715.30; 716.0.

American Meat Institute, 59 East Van Buren Street, Chicago, Ill. 012.5; 016.20; 043.0; 302.36; 302.39; 304.3; 304.6; 331.22; 341.2; 477.6; 477.9; 729.3; 729.5; 745.1; 951.13; 951.22; 951.24; 951.32; 951.64; 953.38; 954.1; 954.36; 959.1; 981.0; 981.4; 961.83; 962.2; 962.3; 982.9.

American Medical Association, Council on Industrial Health, Carl M. Peterson, M.D., secretary, 535 North Dearborn Street, Chicago, Ill. 915.0.

American Medical Association, Council on Physical Medicine, Howard A. Carter, secretary, 535 North Dearborn Street, Chicago 10, Ill. 716.10; 718.7; 810.; 915.0; 915.29; 915.30; 915.31; 915.32; 915.39.

American Mining Congress, Julian D. Conover, secretary, Munsey Building, Washington 4, D.C. 504.43; 603.42; 608.0; 606.3; 710.; 750.; 751.; 970.

American Municipal Association, Earl D. Mallery, executive director, 1313 E. 80th Street, Chicago, Ill. 518.50.

American Oil Chemists' Society, 35 East Wacker Drive, Chicago 1, Ill. 021.8; 040.; 041.1; 041.3; 042.2; 043.0; 112.0; 112.3; 126.11; 135.5; 141.; 142.0; 142.1; 142.2; 142.3; 142.4; 142.5; 142.6; 142.7; 142.8; 142.99; 143.0; 143.1; 143.2; 470.3; 503.0; 504.0; 614.9; 823.; 848.0; 848.2; 848.4; 871.0.

American Paper and Pulp Association; E. W. Tinker, executive secretary, 122 East Forty-second Street, New York, N.Y. 400.5; 470.1; 470.2.

American Petroleum Institute, R. P. Anderson, secretary, Division of Refining, 50 West Fiftieth Street, New York, N.Y.; C. A. Young, secretary, Division of Production, 1205 Continental Building, Dallas 1, Texas. 088.3; 207.3; 314.1; 331.16; 341.2; 399.7; 500.; 502.0; 502.1; 502.2; 503.0; 503.2; 503.3; 503.4; 503.5; 503.8; 503.7; 504.0; 504.40; 504.54; 504.8; 505.0; 505.20; 505.30; 518.9; 518.10; 603.42; 605.23; 607.0; 607.3; 807.4; 607.8; 807.10; 608.52; 811,18; 611.52; 815.81; 815.82; 821.20; 703.0; 703.1; 705.3; 744.2; 754.; 768.0; 766.1; 840.5; 918.9; 919.4; 919.9; 958.2; 997.1.

American Pharmaceutical Association, Justin L. Powers, chairman, National Formulary Committee, 2215 Constitution Avenue, Washington 7, D. C. 021.1; 151.2; 154.71; 161.9; 178.9; 211.1; 501.8; 504.53; 504.54; 504.8; 801.3; 802.1; 802.2; 803.19; 803.20; 803.21; 803.23; 803.29; 811.; 812.; 813.1; 813.2; 813.7; 813.9; 814.1; 814.2; 818.13; 816.14; 816.15; 818.16; 816.16; 816.19; 818,21; 818.23; 818.24; 818.25; 818.29; 816.31; 818.35; 816.38; 818.39; 816.46; 818.49; 818.53; 816.55; 818.56; 816.59; 816.62; 818.83; 818.71; 816.72; 816.73; 816.74; 818.75; 818.76; 816.77; 816.79; 817.11; 817.14; 817.15; 817.26; 817.32; 817.33; 817.34; 817.35; 817.36; 817.37; 817.39; 817.41; 817.42; 817.43; 817.44; 817.45; 817.46; 817.51; 817.53; 817.54; 817.55; 817.56; 817.57; 817.59; 817.64; 817.85; 817.71; 817.72; 817.81; 817.82; 817.83; 817.84; 817.89; 817.91; 817.92; 818.19; 818.21; 818.23; 818.30; 818.31; 818.32; 818.33; 818.34; 818.39; 818.41; 818.42; 818.43; 818.46; 818.47; 818.49; 818.51; 818.59; 818.65; 818.69; 818.70; 818.74; 818.77; 818.79; 818.81; 818.82; 818.83; 818.84; 818.85; 818.86; 818.87; 818.89; 818.92; 818.93; 818.94; 818.95; 819.1; 819.4; 819.70; 819.71; 819.72; 819.73; 819.75; 819.79; 819.80; 819.81; 819.83; 819.84; 819.85; 819.89; 819.9; 821.1; 821.2; 821.9; 822.9; 824.; 831.4; 831.9; 832.3; 832.4; 832.9; 833.2; 833.3; 833.5; 833.9; 834.3; 834.5; 834.9; 836.3; 836.9; 838.3; 838.5; 838.9; 839.31; 839.34; 839.35; 839.36; 839.37; 839.38; 839.39; 839.9; 872.2; 882.4; 918.83.

American Public Health Association, Reginald M. Atwater, M.D., executive secretary, 1790 Broadway, New York 19, N.Y. 021.0; 038.0; 518.73; 532.23; 600.6; 807.11; 617.79; 882.0; 915.0.

American Public Works Association, Frederic Bass, executive director, 1313 East Sixtieth Street, Chicago 37, Ill. 401.49; 425.2; 429.4; 472.93; 505.13; 505.14; 505.15; 505.31; 505.32; 505.33; 505.35; 512.10; 512.12; 512.13; 512.14; 516.0; 516.11; 516.3; 516.5; 516.9; 518.11; 518.21; 518.23; 518.25; 518.26; 518.27; 518.29; 518.31; 518.33; 518.34; 518.35; 518.36; 518.37; 518.42; 518.60; 518.63; 518.65; 518.87; 518.82; 518.83; 531.5; 534.10; 534.11; 534.21; 603.1; 805.25; 611.11; 611.41; 615.9; 741.1.

American Railway Engineering Assn., W. S. Lacher, secretary, 59 East Van Buren Street, Chicago, Ill. 392.4; 400.12; 400.20; 400.40; 400.42; 401.10; 401.11; 401.12; 401.13; 401.14; 401.15; 401.16; 401.17; 401.18; 401.19; 401.21; 401.22; 401.23; 401.24; 401.25; 401.28; 401.29; 401.40; 401.41; 401.42; 401.43; 401.44; 401.45; 401.46; 402.2; 402.3; 402.51; 402.52; 411.0; 412.0; 412.1; 412.2; 412.9; 413.0; 413.8; 423.0; 423.2; 423.9; 428.29; 429.3; 429.7; 482.; 489.; 505.13; 505.15; 505.16; 505.17; 505.19; 505.36; 505.39; 511.3; 511.52; 511.73; 512.12; 512.13; 512.14; 512.15; 512.2; 514.0; 514.61; 516.11; 516.2; 516.3; 516.4; 516.9; 517.2; 518.0; 518.10; 518.12; 518.28; 518.31; 518.32; 518.34; 518.35; 518.37; 518.39; 518.41; 518.42; 518.50; 518.52; 518.55; 518.56; 518.57; 518.59; 518.60; 518.61; 518.62; 518.66; 518.67; 518.84; 518.89; 518.9; 521.0; 531.5; 534.11; 534.22; 534.23; 534.24; 534.25; 600.1; 800.6; 603.32; 603.42; 803.43; 805.0; 805.11; 605.12; 605.13; 605.20; 605.21; 805.22; 805.23; 605.24; 605.25; 605.28; 806.0; 606.1; 606.2; 606.3; 606.4; 606.5; 607.0; 607.10; 607.11; 607.3; 607.5; 608.11; 808.9; 611.0; 611.41; 611.51; 816.8; 619.3; 619.9; 621.22; 621.23; 621.24; 621.30; 621.32; 621.33; 631.0; 641.0; 645.9; 646.0; 647.31; 692.1; 701.3; 703.3; 703.9; 715.30; 715.50; 718.5; 721.1; 745.3; 792.1; 793.2; 793.5; 801.3; 834.4; 834.9; 838.3; 839.34; 839.38; 840.1; 882.0; 882.2; 882.3; 918.9; 919.80; 935.; 956.2; 978.; 998.

American Refractories Institute, W. J. Westphalen, Railway Exchange Building, St. Louis, Mo. 534.12.

American Road Builders' Association, Charles M. Upham, engineer-director, International Building, Washington D. C. 402.2; 743.; 793.5.

American Society of Agricultural Engineers, Raymond Olney, secretary, St. Joseph, Mich. 110.; 729.5; 732.

American Society of Anesthetists, Inc., Paul M. Wood, M.D., secretary, 745 Fifth Avenue, New York, N.Y. 915.30.

American Society of Bakery Engineers, Victor E. Marx, secretary, 1541 Birchwood Avenue, Chicago 26, Ill. 786.; 792.0.

American Society of Civil Engineers, George T. Seabury, secretary, 33 West Thirty-ninth Street, New York 18, N.Y. 605.12; 611.12; 700.; 706.0; 718.40; 719.63; 724.0; 882.0; 910.; 916.0.

American Society of Heating and Ventilating Engineers, A. V. Hutchinson, secretary, 51 Madison Avenue, New York, N.Y. 614.0; 614.4; 614.9; 709.; 792.0; 792.1; 792.2; 793.4.

American Society of Mechanical Engineers, C. E. Davies, secretary, 29 West Thirty-ninth Street, New York, N. Y. 462.; 500.; 501.0; 503.0; 503.4; 504.0; 516.70; 541.3; 600.6; 603.1; 603.21; 603.26; 604.0; 604.11; 604.20; 605.11; 605.12; 605.22; 605.23; 607.0; 607.11; 607.14; 607.2; 607.3; 607.4; 607.6; 606.0; 606.2; 606.30; 606.31; 606.32; 606.4; 606.52; 611.11; 611.21; 611.41; 611.51; 611.52; 611.55; 614.4; 614.5; 614.52; 615.15; 615.42; 615.62; 616.91; 617.79; 619.2; 621.21; 621.22; 621.23; 621.24; 621.26; 621.32; 622.1; 622.3; 622.5; 631.21; 631.23; 641.12; 641.21; 642.22; 642.23; 642.24; 642.25; 643.3; 645.21; 645.22; 645.23; 645.24; 645.25; 645.4; 646.41; 651.5; 654.52; 656.1; 670.; 700.; 701.1; 701.2; 701.3; 702.0; 702.9; 703.0; 703.2; 703.9; 704.0; 705.0; 706.0; 706.1; 710.; 715.21; 716.0; 716.40; 719.63; 724.0; 744.1; 744.2; 745.2; 745.3; 745.4; 750.; 751.; 754.; 755.0; 756.; 760.; 765.; 766.0; 766.1; 766.2; 767.; 785.0; 791.0; 791.2; 793.0; 793.2; 795.; 910.; 912.; 917.2; 917.3; 919.1; 919.5; 919.60; 919.9; 935.; 974.0; 974.2.

American Society for Metals, W. H. Eisenman, secretary, 7301 Euclid Ave., Cleveland, Ohio. 600.0; 600.1; 600.3; 600.5; 600.6; 631.0; 633.0; 634.; 643.0; 651.0; 653.0; 661.; 662.; 661.0; 663.0; 693.0; 695.0; 695.1; 696.; 767.; 633.0.

American Society of Refrigerating Engineers, David L. Fiske, secretary, 37 West Thirty-ninth Street, New York, N. Y. 607.6; 765.0; 791.2; 792.0; 959.4.

American Society of Sanitary Engineering, James R. Walker, secretary, City Hall, Waterbury, Conn. 607.11; 645.25.

American Society for Testing Materials, C. L. Warwick, secretary-treasurer, 260 South Broad Street, Philadelphia 2, Pa. 040.; 093.0; 142.0; 143.2; 200.; 202.0; 202.10; 202.40; 202.41; 203.2; 204.90; 206.0; 207.0; 206.1; 206.4; 206.93; 211.1; 211.3; 211.5; 216.; 296.2; 300.4; 300.5; 300.6; 302.10; 302.20; 302.40; 303.0; 303.3; 303.6; 303.97; 304.4; 304.71; 304.93; 306.19; 306.24; 306.2; 308.9; 309.0; 314.1; 315.5; 319.97; 320.; 330.; 331.10; 360.; 365.0; 365.96; 366.0; 367.0; 369.21; 370.; 374.2; 392.0; 392.10; 392.4; 397.0; 399.7; 399.9; 400.0; 400.13; 400.40; 400.42; 401.40; 402.3; 412.0; 412.1; 413.52; 425.2; 429.9; 470.3; 473.2; 473.3; 473.5; 477.5; 500.; 501.0; 501.1; 501.2; 501.5; 502.0; 502.1; 502.2; 503.0; 503.2; 503.3; 503.4; 503.5; 503.6; 503.7; 504.0; 504.40; 504.50; 504.54; 504.6; 504.8; 504.9; 505.0; 505.14; 505.15; 505.16; 505.17; 505.19; 505.20; 505.29; 505.30; 505.31; 505.32; 505.34; 505.35; 505.36; 505.39; 510.; 511.0; 511.2; 511.50; 511.53; 511.70; 511.71; 512.10; 512.11; 512.12; 512.13; 512.14; 512.15; 512.16; 512.2; 513.; 514.0; 514.1; 514.2; 514.3; 514.61; 514.62; 514.63; 516.0; 516.10; 516.11; 516.12; 516.19; 516.3; 516.4; 517.0; 517.2; 518.0; 516.10; 516.21; 516.30; 516.31; 516.32; 516.34; 516.39; 516.50; 518.53; 516.60; 516.61; 516.62; 518.65; 518.67; 516.9; 520.; 524.; 526.1; 526.; 531.0; 531.3; 531.5; 532.22; 534.10; 534.11; 534.12; 534.20; 534.21; 534.22; 534.25; 534.29; 545.3; 545.4; 545.9; 551.; 552.; 572.; 593.; 594.; 600.1; 600.2; 600.3; 600.4; 600.5; 601.23; 602.1; 602.2; 603.1; 603.21; 603.23; 603.24; 603.26; 603.33; 603.41; 603.42; 603.43; 603.52; 604.11; 604.14; 604.19; 604.22; 604.29; 604.32; 605.11; 605.12; 605.13; 605.15; 605.19; 605.21; 605.25; 605.26; 606.1; 606.2; 606.4; 606.5; 607.11; 607.12; 607.14; 607.2; 607.3; 607.4; 607.5; 607.6; 606.11; 606.4; 611.0; 611.11; 611.21; 611.3; 611.41; 611.51; 611.52; 611.53; 611.54; 611.55; 611.56; 611.59; 619.9; 621.20; 621.21; 621.22; 621.23; 621.24; 621.25; 621.26; 621.31; 621.32; 621.33; 621.34; 621.36; 621.39; 622.1; 622.3; 622.5; 622.6; 631.0; 631.11; 631.12; 631.21; 631.23; 631.32; 631.41; 641.0; 641.11; 641.12; 641.21; 641.22; 641.23; 642.11; 642.12; 642.22; 642.23; 642.24; 642.9; 643.0; 643.2; 643.3; 643.4; 643.6; 643.7; 643.9; 644.0; 644.11; 644.12; 644.21; 644.22; 644.23; 645.11; 645.12; 645.21; 645.22; 645.23; 645.24; 645.31; 645.9; 646.0; 646.11; 646.31; 646.41; 646.52; 647.11; 647.12; 647.13; 647.14; 647.15; 647.16; 647.17; 647.18; 647.22; 647.23; 647.25; 647.26; 647.32; 647.33; 647.35; 647.36; 647.36; 651.3; 653.1; 653.2; 653.31; 653.32; 653.33; 654.1; 654.2; 654.3; 654.52; 654.53; 654.59; 655.2; 655.3; 655.4; 655.5; 656.0; 656.1; 681.1; 661.3; 682.; 683.0; 683.1; 683.2; 683.41; 692.1; 692.2; 692.3; 693.1; 693.2; 693.3; 695.1; 695.2; 695.4; 695.5; 695.6; 700.; 702.2; 703.2; 707.20; 707.43; 707.47; 707.49; 710.; 712.0; 714.50; 715.41; 715.43; 715.44; 716.16; 716.60; 719.50; 719.51; 719.52; 719.55; 719.56; 719.57; 719.58; 719.59; 719.63; 719.99; 770.; 600.0; 601.1; 801.2; 601.3; 622.1; 822.2; 622.9; 633.2; 634.0; 634.4; 634.6; 634.8; 634.9; 837.9; 639.1; 839.2; 639.38; 639.9; 640.3; 640.5; 640.9; 841.2; 641.41; 641.42; 641.43; 641.44; 841.5; 841.6; 841.7; 642.1; 642.2; 642.3; 642.4; 642.5; 842.61; 642.63; 842.64; 842.69; 642.7; 642.66; 642.67; 842.9; 644.1; 846.0; 646.11; 646.50; 646.59; 646.62; 646.63; 647.1; 847.2; 848.0; 648.11; 646.12; 646.2; 646.4; 648.7; 648.9; 849.19; 849.3; 849.9; 871.0; 671.11; 871.12; 871.13; 671.15; 871.21; 671.22; 671.23; 671.5; 871.9; 882.0; 693.0; 893.4; 893.5; 893.8; 893.9; 910.; 915.19; 917.0; 917.3; 918.9; 919.4; 919.62; 919.9; 953.2; 955.0; 957.19; 959.9; 997.1.

American Standards Association, P. G. Agnew, secretary, 70 East 45th Street, New York 17, N. Y. 067.1; 067.11; 068.2; 068.6; 069.4; 200.; 202.31; 202.41; 203.2; 206.0; 216.; 296.4; 311.1; 311.2; 311.3; 311.5; 311.92; 400.3; 400.31; 401.10; 401.30; 401.32; 401.34; 401.36; 412.3; 478.34; 469.; 500.; 501.0; 501.2; 501.5; 502.0; 502.1; 502.2; 503.0; 503.2; 503.3; 503.4; 503.5; 503.6; 503.7; 504.0; 504.40; 504.54; 504.6; 505.0; 505.20; 505.3; 512.10; 512.13; 512.15; 512.16; 514.0; 514.1; 514.2; 514.3; 514.61; 514.63; 516.3; 516.4; 516.0; 518.50; 518.51; 516.62; 521.0; 524.; 526.1; 532.22; 534.22; 541.3; 545.6; 574.; 600.1; 600.3; 600.6; 602.2; 603.1; 603.21; 603.42; 603.43; 604.0; 604.32; 605.0; 605.11; 605.12; 605.13; 605.19; 605.22; 605.25; 606.0; 607.0; 607.10; 607.11; 607.12; 607.14; 607.2; 607.3; 607.4; 607.6; 608.0; 606.2; 606.30; 606.31; 608.32; 606.4; 611.11; 611.16; 611.41; 611.52; 611.55; 614.0; 614.2; 614.4; 614.9; 615.42; 615.5; 615.62; 616.91; 617.79; 621.21; 621.22; 621.24; 621.30; 621.32; 621.33; 622.1; 622.3; 622.5; 622.6; 634.; 641.11; 642.11; 645.11; 645.21; 645.25; 645.4; 646.41; 651.0; 651.5; 652.0; 662.; 695.; 696.; 700.; 701.3; 703.1; 703.2; 703.9; 705.4; 706.0; 710.; 711.10; 711.11; 711.12; 711.20; 711.21; 711.22; 711.24; 712.1; 712.2; 713.1; 713.2; 713.3; 713.5; 714.10; 714.11; 714.12; 714.13; 714.14; 714.30; 714.31; 714.39; 714.41; 714.42; 714.50; 714.51; 714.52; 715.21; 715.40; 715.41; 715.43; 715.44; 715.51; 716.11; 716.15; 716.16; 716.19; 716.30; 716.31; 716.32; 717.0; 716.0; 716.60; 716.63;

716.64; 716.65; 716.69; 718.7; 719.50; 719.51; 719.54; 719.55; 719.57; 719.56; 719.59; 719.60; 719.62; 719.63; 722.32; 722.33; 722.35; 722.36; 722.39; 724.0; 724.26; 726.1; 744.1; 745.2; 745.3; 745.4; 751.; 760.; 761.; 765.; 766.0; 766.2; 767.; 766.; 770.; 762.; 763.; 784.0; 765.0; 767.; 766.; 789.; 791.0; 792.0; 601.1; 601.2; 801.6; 614.2; 622.0; 624.; 637.9; 839.35; 639.45; 839.49; 639.6; 639.9; 640.5; 846.21; 642.64; 642.7; 642.66; 846.63; 881.18; 881.32; 910.; 911.0; 911.1; 911.2; 911.3; 911.4; 911.5; 911.6; 911.9; 912.; 914.0; 914.5; 915.19; 918.9; 919.4; 919.9; 935.; 956.1.

American Transit Association, G. C. Hecker, general secretary, 292 Madison Avenue, New York 17, N.Y. 202.11; 301.11; 400.42; 400.43; 401.10; 401.30; 401.31; 401.32; 401.34; 401.36; 402.1; 427.; 429.7; 503.3; 518.20; 516.51; 532.22; 600.3; 603.1; 603.26; 604.14; 606.0; 606,1; 606.2; 606.3; 606.4; 606.5; 606.6; 607.4; 611.16; 611.22; 611.29; 611.43; 611.44; 611.52; 611.53; 611.55; 616.35; 619.2; 619.9; 622.1; 622.5; 622.9; 641.11; 692.3; 710.; 711.20; 715.11; 715.30; 715.36; 715.40; 715.41; 715.44; 715.51; 716.0; 716.11; 716.30; 716.39; 716.49; 719.50; 719.52; 719.55; 719.56; 719.57; 719.59; 719.60; 719.63; 721.1; 723.0; 726.0; 726.1; 726.2; 767.; 801.3; 970.

American Trucking Association, Inc., J. V. Lawrence, general manager, 1424 Sixteenth Street, N.W. Washington, D.C. 469.; 722.1; 950.; 951.12; 951.13; 951.21; 951.31; 951.32; 951.33; 951.34; 951.43; 951.44; 951.46; 951.61; 951.62; 951.64; 951.72; 952.11; 952.2; 953.2; 953.30; 953.36; 953.39; 954.1; 954.21; 954.36; 954.4; 955.2; 956.1; 957.19; 957.2; 959.1; 959.6.

American Trudeau Society, Medical Section of National Tuberculosis Association, Dr. Charles E. Lyght, director of Health Education, 1790 Broadway, New York 19, N.Y. 610.; 916.0.

American Veterinary Medical Association, J. G. Hardenbergh, executive secretary, 600 South Michigan Avenue, Chicago 5, Ill. 612.

American Vitrified China Manufacturers Association, A. M. Walker, president, c/o Bailey-Walker China Co., Bedford, Ohio. 532.1.

American Walnut Manufacturers Association, Burdett Green, secretary-manager, 616 South Michigan Boulevard, Chicago, Ill. 400.38; 411.43.

American Warehousemens Association, Wilson V. Little, general secretary, 222 W. Adams Street, Chicago, Ill. 489.

American Water Works Association, Harry E. Jordan, secretary, 500 Fifth Avenue, New York 18, N.Y. 516.3; 516.9; 605.23; 607.0; 607.10; 607.12; 607.4; 607.6; 611.13; 707.40; 793.4; 636.3; 840.1; 843.31; 882.0; 974.0; 974.2;

American Waxed Paper Institute, George J. Lincoln, Jr., executive secretary, 111 Washington St., Chicago, Ill. 476.4; 477.5.

American Welding Society, William Spraragen, technical secretary, 33 West Thirty-ninth Street, New York, N.Y. 603.26; 605.21; 605.22; 607.3; 607.4; 631.32; 693.0; 767.

American ~~Wood~~-Preservers' Association, Horace L. Dawson, secretary, 1427 Eye Street, N.W., Washington, D.C. 400.40; 400.42; 400.43; 400.49; 401.30; 401.40; 402.3; 400.42; 404.0; 502.0; 502.2; 505.33; 505.37; 518.50; 518.56; 801.3; 839.30; 839.36; 839.9; 918.2.

American Zinc Institute, Ernest V. Gent, secretary, 60 East Forty-second Street, New York 17, N.Y. 663.2.

Anthracite Industries, Inc., Allen J. Johnson, director of laboratory, Primos, Delaware County, Pa. 614.0; 614.1; 614.4; 614.9.

Anthracite Institute, Louis C. Maderia III, executive director, 101 Park Avenue, New York 17, N.Y. 501.1.

Anti-Friction Bearing Manufacturers Association, Inc., H. O. Smith, secretary-manager, 60 East Forty-second Street, New York, N.Y. 504.40; 766.2.

Appalachian Hardwood Manufacturers, Inc., H.E. Everley, manager, Trade Extension Department, 414 Walnut Street, Cincinnati, Ohio. 411.43; 423.9.

Apple Growers Association, J. E. Klahre, general manager, Hood River, Oregon. 476.4.

Arkansas Soft Pine Bureau, B. E. Lowry, executive secretary, Little Rock, Ark. 400.26; 402.2; 402.41; 402.42; 402.51; 403.2; 411.1; 411.27; 411.3; 411.43; 411.5; 411.6; 412.1; 423.5; 423.9.

Aromatic Red Cedar Closet Lining Association, A. L. Foster, chairman, c/o George C. Brown & Co., Greenboro, N.C. 411.9.

Asphalt Institute, W. R. Macatee, managing director, 601 Second Avenue, New York 17, N.Y. 505.0; 505.13; 505.3; 518.37.

Associated Cooperage Industries of America, Inc., M. T. Rogers, assistant secretary, 408 Olive Street, St. Louis 2, Mo. 421.0; 421.1; 421.2; 421.3; 951.10; 951.13.

Associated Factory Mutual Fire Insurance Companies, Inspection Dept., O.W. Stewart, manager, 184 High Street, Boston, Mass. 400.50; 501.1; 503.0; 505.17; 505.19; 515.; 516.0; 516.50; 516.51; 516.54; 516.55; 516.56; 516.59; 518.9; 545.3; 545.9; 604.0; 604.29; 605.22; 605.23; 607.0; 607.11; 607.3; 607.4; 607.6; 611.13; 611.14; 614.0; 614.9; 703.0; 706.0; 710.0; 711.10; 715.30; 715.51; 725.41; 755.0; 755.1; 640.2; 646.0; 950.; 956.2; 970.; 974.0; 974.4; 976.; 997.5.

Associated General Contractors of America, Inc., Herbert F. Foreman, managing director, Munsey Building, Washington 4, D. C. 518.0; 742.; 755.1.

Association of American Feed Control Officials (Inc.), Leslie E. Bopst, secretary-treasurer, College Park, Md. 021.3; 021.9; 039.4; 042.2; 042.3; 042.4; 042.5; 042.6; 045.; 098.1; 103.4; 112.1; 112.2; 112.3; 112.4; 112.5; 112.6; 112.9; 117.2; 116.1; 116.2; 118.3; 118.9; 119.1; 119.2; 119.3; 119.4; 119.5; 119.6; 119.9; 133.2; 133.21; 154.6; 155.5; 642.4.

Assn. of American Railroads, Bulletin 3, L. C. Heilman, secretary, Joint Committee on Grade Crossing Protection, Transportation Bldg., Washington 6, D.C. 718.41; 718.5; 998.

Association of American Railroads, Bureau of Explosives, H. A. Campbell, chief inspector, 30 Vesey Street, New York, 7 N.Y. 489.; 956.1; 957.19; 957.2; 958.3; 959.1; 954.1; 954.21; 954.36; 955.2; 955.9; 953.30; 953.34; 953.36; 953.39; 951.61; 951.62; 951.72; 953.2; 953.30; 951.33; 951.34; 951.43; 951.44; 951.46; 950.; 951.12; 951.13; 951.31; 951.32.

Association of American Railroads, Freight Container Bureau, Edward Dahill, chief engineer, 30 Vesey Street, New York, N.Y. 726.2; 751.10; 951.13; 952.10; 952.11; 953.2; 953.30; 953.35; 953.39; 954.1; 954.30; 954.36; 959.1.

Assn. of American Railroads, Mechanical Div., Electrical Section, A. C. Browning, secretary, 59 East Van Buren Street, Chicago 5, Ill. 704.1; 711.12; 711.20; 712.2; 714.30; 715.21; 715.44; 716.11; 716.19; 716.2; 716.39; 719.58; 721.1; 767.; 792.3.

Assn. of American Railroads, Mechanical Div., Wheel and Axle Manual, A. C. Browning, secretary, 59 East Van Buren Street, Chicago 5, Ill. 611.52; 611.53.

Assn. of American Railroads, Operations and Maintenance Dept., Engineering Div., Electrical Section, W. S. Lacher, secretary, 59 East Van Buren Street, Chicago 5, Ill. 710.; 711.20; 714.11; 715.21; 715.40; 715.41; 715.44; 716.30; 718.41; 718.49; 718.5; 718.7; 719.55; 719.56; 719.60; 719.62; 719.63; 719.64.

Association of American Railroads, Operation & Maintenance Department Engineering Division, Signal Section, R.H.C. Balliet, 30 Vesey Street, New York 7, N.Y. 400.42; 504.19; 504.6; 504.8; 524.; 525.3; 532.22; 600.3; 603.0; 603.1; 603.42; 606.3; 607.0; 607.3; 607.4; 608.31; 608.32; 611.11; 611.21; 642.13; 710.; 712.0; 712.1; 712.2; 712.3; 712.4; 713.1; 713.5; 713.7; 714.11; 714.12; 714.31; 714.33; 714.42; 715.11; 715.30; 715.39; 715.40; 715.41; 715.43; 715.44; 715.51; 716.10; 716.11; 718.40; 718.41; 718.42; 718.43; 718.49; 718.5; 719.50; 719.52; 719.55; 719.56; 719.57; 719.59; 719.60; 719.62; 767.; 840.1; 844.4; 847.1; 997.1.

Association of American Railroads, Operations Mechanical Division, and Maintenance Dept., A. C. Browning, secretary, 59 East Van Buren Street, Chicago 5, Ill. 200.; 202.11; 202.12; 202.31; 202.42; 202.44; 202.45; 301.12; 400.0; 400.42; 413.20; 473.3; 504.13; 504.24; 504.42; 504.44; 526.6; 531.5; 532.22; 602.1; 603.0; 603.1; 603.21; 603.33; 603.42; 603.52; 604.11; 604.20; 604.32 605.13; 605.14; 606.3; 607.0; 607.2; 607.3; 607.4; 607.6; 608.0; 608.31; 608.32; 608.4; 611.11; 611.18; 611.21; 611.22; 611.41; 611.42; 611.43; 611.44; 611.49; 611.51; 611.52; 611.53; 611.54; 611.55; 611.59; 612.22; 613.6; 613.9; 615.82; 616.99; 621.32; 622.5; 622.9; 642.22; 642.24; 646.41; 692.1; 692.2; 692.3; 701.3; 702.9; 703.0; 703.2; 703.9; 707.13; 711.12; 711.20; 712.2; 715.21; 716.0; 716.12; 716.2; 716.39; 719.58; 719.59; 721.1; 726.0; 726.1; 726.2; 767.; 792.0; 794.; 981.4; 982.; 982.2; 982.3; 982.4; 982.5; 982.9.

Assn. of American Railroads, Operations and Maintenance Dept., Operating-Transportation Division, Medical and Surgical Section, J. C. Caviston, secretary, 30 Vesey Street, New York, N.Y. 915.0.

Association of American Railroads, Operations and Maintenance Dept., Operating—Transportation Division, Operating Section, J. C. Caviston, secretary, 30 Vesey Street, New York 7, N.Y. 716.30; 718.40; 718.42; 863.

Association of American Railroads, Operations and Maintenance Dept., Operating—Transportation Div., Safety Section, J. C. Caviston, secretary, 30 Vesey Street, New York 7, N.Y. 700.: 710.0; 721.1; 722.0; 726.0; 785.0; 789.

Assn. of American Railroads, Operations and Maintenance Dept., Traffic Dept. 793.5.

Assn. of American Railroads, Operating and Transportation Div., The Standard Code, J. C. Caviston, secretary, 30 Vesey Street, New York 7, N.Y. 718.40; 718.41; 718.42.

Association of American Railroads, Purchases and Stores Division, W. J. Farrell, executive vice-chairman, Transportation Building, Washington 6, D.C. 612.29; 681.41; 700.; 951.64; 954.21; 959.1; 959.8; 997.1.

Association of American Railroads, Telegraph and Telephone Section, W. A. Fairbanks, secretary, 30 Vesey Street, New York 7, N.Y. 046.; 069.3; 203.2; 331.12; 331.21; 400.42; 401.30; 401.31; 401.32; 401.36; 401.9; 402.1; 412.9; 427.; 429.3; 429.7; 429.9; 435.5; 475.9; 516.9; 518.51; 518.65; 518.9; 526.1; 531.5; 532.22; 600.3; 603.41; 603.42; 608.11; 613.6; 613.7; 616.5; 616.63; 642.13; 646.32; 651.4; 693.1; 712.1; 712.2; 713.7; 714.12; 714.21; 714.22; 715.11; 715.12; 715.30; 715.39; 715.40; 715.41; 715.42; 715.43; 715.44; 715.50; 715.51; 718.0; 718.1; 718.12; 718.20; 718.21; 718.22; 718.29; 718.32; 718.40; 718.41; 718.60; 719.55; 719.56; 719.60; 719.61; 719.62; 719.93; 719.99; 726.1; 862.; 932.2; 932.9; 953.39; 954.21; 954.23; 957.14; 958.2; 958.3.

Association of American Wood Pulp Importers, A. Blattmann, secretary, 347 Madison Avenue, New York, N.Y. 400.50.

Association of Edison Illuminating Companies, Preston S. Millar, secretary, 40 West 40th St., New York 18, N.Y. 714.34; 714.38; 714.41; 714.51; 715.41.

Association of Iron and Steel Engineers, Brent Wiley, managing director, Empire Building, Pittsburgh 22, Pa. 710.; 711.12; 744.1.

Association of Lift Truck and Portable Elevator Manufacturers, Howard R. Waterbury, executive secretary, and treasurer, P. O. Box 295, Stamford, Conn. 613.9; 729.3; 729.6; 745.3; 959.9.

Association of Manufacturers of Chilled Car Wheels, F. H. Hardin, president, 445 North Sacramento Boulevard, Chicago 12, Ill. 611.18.

Association of Official Agricultural Chemists (Inc.) W. W. Skinner, secretary-treasurer, Box 540, Benjamin Franklin Station, Washington, D.C. 010.; 019.0; 021.1; 021.2; 021.7; 021.9; 022.1; 022.40; 031.; 034.; 035.2; 036.0; 040.; 060.; 100.; 104.; 107.; 107.3; 108.0; 108.4; 110.; 112.0; 119.4; 120.; 126.7; 130.; 142.0; 151.0; 152.1; 152.2; 153.0; 154.0; 155.1; 155.5; 160.; 162.; 164.1; 165.0; 171.; 173.; 175.1; 175.2; 175.3; 175.4;

175.5; 175.6; 175.7; 175.9; 178.0; 179.; 211.1; 216.; 231.; 594.; 802.1; 803.13; 810.; 811.; 813.9; 814.2; 815.2; 819.4; 819.9; 821.2; 821.7; 821.9; 824.; 832.4; 833.9; 834.1; 834.2; 834.8; 834.9; 839.33; 839.38; 839.7; 839.9; 840.5; 850.; 859.; 871.0; 881.0; 881.11; 881.12; 881.15; 881.19; 881.21; 881.22; 881.23; 881.24; 881.4; 881.9; 882.0; 882.3; 892.

Association of Official Seed Analysts, Elva L. Norris, secretary-treasurer, Kansas State College, Manhattan, Kansas. 240.

Bar Reinforced Tire Chain Manufacturers, W. B. Lasher, Jr., director of research, American Chain Division, American Chain & Cable Company, Inc., Box 298, York, Pa. 603.55.

Book Manufacturers' Institute, Inc., J. Raymond Tiffany, general counsel, 25 West Forty-third Street, New York, N.Y. 392.21; 481.

Brake Lining Manufacturers' Assn., Inc., Miss H. G. Duschek, 370 Lexington Avenue, New York 17, N. Y. 545.5; 722.34.

Brick Manufacturers Association of New York, 2721 Grand Central Terminal, New York, N.Y. 518.83; 518.89.

Buff and Polishing Wheel Manufacturers Association, Inc., H. L. Gaardsmoe, secretary, 110 East Forty-second Street, New York 17, N.Y. 541.3; 765.

Building Officials' Conference of America, Walker S. Lee, president, 80 S. Fitzhugh St., Rochester, N.Y. 514.3; 516.3; 518.50.

Calcium Chloride Association, Ray A. Giddings, secretary, Penobscot Building, Detroit 26, Mich. 500.; 516.0; 518.30; 785.0; 833.0.

California Fruit Exchange, F. W. Reed, assistant general manager. P. O. Box 2038, Blue Anchor Building, Sacramento, Calif. 130.

California Fruit Growers Exchange, Charles C. Teague, president, 707 W. Fifth Avenue, Los Angeles, Calif. 131.22; 131.23; 131.25.

California Olive Association, E. Hevel, secretary, 216 Pine Street, San Francisco 4, Calif. 131.4.

California Redwood Association, Kenneth Smith, president and general manager, 405 Montgomery Street, San Francisco 4, Calif. 400.27; 401.17; 401.29; 401.47; 402.2; 402.41; 402.42; 402.43; 402.51; 402.52; 411.1; 411.29; 411.3; 411.41; 411.42; 411.43; 411.5; 411.6; 411.7; 412.1; 413.1; 413.6; 413.8; 423.5.

California Ripe Olive Standardization Act. Director of Agriculture, State of California, Sacramento, Calif. 131.4.

California Walnut Growers Association, A. W. Christie, field manager, 1745 East Seventh Street, Los Angeles, Calif. 135.7.

Canners League of California, Preston McKinney, vice president and secretary, 64 Pine Street, San Francisco, Calif. 130.; 131.3; 134.13; 134.22; 134.41; 134.42; 134.44; 134.45; 134.56.

Cast Stone Institute, M. A. Arnold, vice president, 33 W. Grand Ave., Chicago, Ill. 516.4.

Central Committee on Lumber Standards, John Foley, forester, chairman, Pennsylvania Railroad Company, Philadelphia, Pa. 400.0; 400.20; 402.52; 411.0; 413.0.

Certified Milk Producers Association of America (Inc.), S. W. Shoemaker, secretary, 1265 Broadway, New York, N.Y. 021.1; 021.6.

Certified Pulp Testers' Bureau, c/o C. M. Haskins, National Association of Waste Material Dealers, Times Building, New York, N.Y. 400.50.

Chlorine Institute, Inc., Robert T. Baldwin, secretary, 50 East Forty-first Street, New York, N.Y. 607.8; 726.2; 839.44.

Clay Products Association, J. D. Cook, secretary, 111 West Washington Street, Chicago, Ill. 518.55; 518.67; 534.23; 534.29.

Clay Sewer Pipe Association, Inc., H. C. Maurer, president, 1902 A. I. U. Building, 50 W. Broad St., Columbus 15, Ohio. 518.55; 518.67; 531.5.

Coated Abrasives Association, George Link, president, 17 John Street, New York, N.Y. 541.4.

Collapsible Tube Manufacturers Association, Lester B. Platt, secretary, 19 West Forty-fourth Street, New York, N.Y. 651.8; 681.49.

Compressed Air Institute, C. C. Rohrbach, secretary, 90 West Street, New York, N.Y. 615.9; 741.3; 744.2; 791.2.

Compressed Gas Manufacturers' Association, Inc., F. R. Fetherston, secretary, 11 West Forty-second Street, New York, N.Y. 607.6; 839.49; 956.1.

Concrete Reinforcing Steel Institute, H. C. Delzell, managing director, Builders Building, Chicago 1, Ill. 516.0; 516.3; 518.50; 518.57; 805.25.

Consolidated Freight Classification Committee, R. C. Fyfe, chairman, Room 202, Chicago Union Station, Chicago 6, Ill. 950.

Contracting Plasterers International Association, Edward McDonnell, secretary, 4755 Commonwealth Avenue, Detroit 8, Mich. 362.1; 402.51; 512.12; 514.63; 516.2; 517.2; 605.24; 608.11.

Copper and Brass Research Association, T. E. Veltfort, manager, 420 Lexington Avenue, New York, N.Y. 640.; 641.21; 641.22; 642.11; 642.12; 642.23; 642.24; 643.0; 644.21; 644.23; 645.11; 645.12; 645.23; 645.24; 646.21; 646.22; 646.31; 646.32; 646.42; 647.0.

Copper Wire Engineering Association, Stanton Hertz, executive director, 815 Fifteenth Street, N.W., Washington, D.C. 715.40; 715.41; 715.44; 719.60.

Cordage Institute, J. S. McDaniel, secretary, 350 Madison Avenue, New York 17, N.Y. 302.40; 331.20.

Cotton-Textile Institute (Inc.). Paul B. Halstead, secretary, 320 Broadway, New York, N.Y. 392.3.

Crucible Manufacturers' Association, C. C. Rohrbach, secretary, 90 West Street, New York 6, N.Y. 574.

Cup and Container Institute, Granville P. Rogers, executive director, 1790 Broadway, New York, N.Y. 954.1.

Dairy Industries Supply Association, Roberts Everett, 232 Madison Avenue, New York, N.Y. 607.0; 646.51; 731.

Diamond Core Drill Manufacturers Association, Clifford C. Rohrbach, secretary, 90 West Street, New York 6, N.Y. 741.3.

Diesel Engine Manufacturers' Association, Harvey T. Hill, executive director, 1 North La Salle Street, Chicago 2, Ill. 704.1.

Douglas Fir Plywood Association, N. S. Perkins, technical director, Tacoma Building, Tacoma 2, Washington. 400.23; 413.50.

Drop Forging Association, Raymond M. Seabury, secretary-treasurer, 605 Hanna Building, Cleveland, Ohio. 603.24; 611.50.

Durable Woods Institute, Hal B. Alston, director, 155 E. 44th Street, New York, N.Y. 413.1.

Edison Electric Institute, 420 Lexington Avenue, New York, N.Y. 402.1; 526.1; 532.22; 603.42; 608.2; 608.31; 608.32; 608.6; 642.13; 713.5; 714.34; 714.38; 714.39; 715.30; 715.32; 718.60; 718.62; 718.65; 719.62; 719.72.

Electric Hoist Manufacturers Association, E. Donald Tolles, secretary-counsel, 500 Fifth Avenue, New York 18, N.Y. 744.2.

Electric Tool Institute, Sioux City, Iowa. 711.24.

Employing Bookbinders of America, A. G. Watson, executive secretary, 28 West Forty-fourth Street, New York, N.Y. 392.21.

Evaporated Milk Association, Frank E. Rice, executive secretary, 307 North Michigan Avenue, Chicago 1, Ill. 021.0; 021.6; 518.59; 731.

Facing Tile Institute, Affiliated with Structural Clay Products Institute, Harry C. Plummer, director of engineering and research, 1756 K Street N.W., Washington, D.C. 534.25; 534.29.

Farm Equipment Institute, Robert A. Jones, secretary, 608 South Dearborn Street, Chicago 5, Ill. 413.54.

Felt-Manufacturers Association, Lillian C. McManus, secretary, 17 John Street, New York, N.Y. 365.98; 390.5.

Fibre Box Association, Elmer J. Koch, executive secretary, 224 South Michigan Avenue, Chicago, Ill. 953.2.

Fir Door Institute, W. E. Difford, managing director, Tacoma Building, Tacoma, Washington. 423.1.

Fluorescent Lighting Association, Joseph M. Smith, technical director, 60 Beaver Street, New York, N.Y. 716.18.

Folding Paper Box Association of America, A. E. Murphy, 134 North La Salle Street, Chicago 2, Ill. 953.2.

Formed Steel Tube Institute, N. Myles Brown, secretary, 1621 Euclid Avenue, Cleveland, Ohio. 607.4; 611.52.

Glass Container Association of America, V. L. Hall, assistant business manager, 19 West Forty-fourth Street, New York, N.Y. 522.; 955.0; 955.1; 955.3; 955.4.

Grinding Wheel Manufacturers Association, Harry B. Lindsay, secretary-treasurer, 27 Elm Street, Worcester, Mass. 541.0; 541.3; 765.

Gypsum Association, Henry J. Schweim, general manager, 211 West Wacker Drive, Chicago, Ill. 514.3; 516.3.

Hack Saw Manufacturers Association of America, Inc., Wm. P. Jeffrey, secretary, 50 Broadway, New York 4, N.Y. 615.62.

Hardwood Dimension Manufacturers Association, Inc., Phillips A. Hayward, managing director, Heyburn Building, Louisville 2, Ky. 402.43; 411.42; 411.43; 411.9.

Heat Exchange Institute, C. C. Rohrbach, secretary, 90 West Street, New York 6, N.Y. 703.0; 785.0; 785.1.

Heating, Piping & Air Conditioning Contractors National Association, Joseph C. Fitts, secretary, Suite 1401, Rockefeller Center, 1250 Sixth Avenue, New York, N.Y. 603.26; 607.14; 607.2; 607.4; 607.6; 614.4; 703.0; 767.; 785.1; 792.0; 910.

Hickory Handle Association, Guy E. Basye, secretary, Hope, Ark. 428.1; 428.29.

Highway Research Board, Roy W. Crum, director, 2101 Constitution Avenue, Washington, D.C. 518.30.

Hydraulic Institute, C. C. Rohrbach, secretary, 90 West Street, New York 6, N.Y. 603.21; 611.11; 611.41; 622.1; 622.5; 646.41; 654.51; 703.0; 755.0; 755.1; 793.4.

Illuminating Engineering Society, A. D. Hinckley, executive secretary, 51 Madison Avenue, New York 10, N.Y. 379.9; 524.; 525.; 715.30; 716.19; 716.2; 716.30; 716.39.

Indiana Limestone Institute, E. C. Walters, secretary, Bedford, Ind. 511.2; 518.89.

Industrial Hygiene Foundation of America, Inc., Mrs. Ellen C. Diamond, office manager, 4400 Fifth Avenue, Pittsburgh 13, Pa. 651.0; 792.0; 792.2; 801.1; 839.35; 839.40; 993.

Industrial Management Society, P. H. Weber, president, 421 Engineering Building, 205 West Wacker Drive, Chicago, Ill. 910.

Industrial Safety Equipment Association, W. J. Parker, secretary-treasurer, 366 Madison Avenue, New York, N.Y. 914.5; 915.51.

Industrial Truck Statistical Association, W. S. McCann, secretary, 208 South La Salle Street, Chicago 4, Ill. 713.4; 721.2.

Industrial Unit Heater Association, L. O. Monroe, secretary, 5-208 General Motors Building, Detroit, Mich. 614.0; 792.0; 792.2.

Institute of Boiler and Radiator Manufacturers, R. E. Ferry, general manager, 60 East Forty-second Street, New York, N.Y. 614.4.

Institute of Book Cloth and Impregnated Fabrics Manufacturers, C. Steward Comeaux, secretary, 103 Park Avenue, New York 17, N.Y. 392.21.

Institute of Cooking and Heating Appliance Manufacturers, Samuel Dunckel, managing director, Shoreham Hotel, Washington, D.C. 614.0; 614.3.

Institute of Makers of Explosives, C. Stewart Comeaux, secretary, 103 Park Avenue, New York 17, N.Y. 860.

Institute of Radio Engineers, Inc., Harold P. Westman, secretary, 330 West Forty-second Street, New York, N.Y. 718.60; 718.61; 718.62; 718.63; 718.64; 718.65; 718.69; 719.93.

Institute of Shortening Manufacturers, Inc., Earl S. Haines, executive secretary, Norris Building, Atlanta, Ga. 142.0; 959.9.

Institute of Traffic Engineers, W. Graham Cole, secretary, 60 John Street, New York, N.Y. 718.5.

Insulated Power Cable Engineers Association, G. M. Haskell, secretary, c/o General Cable Corporation, 420 Lexington Avenue, New York, N.Y. 715.41.

Insulation Board Institute, J. B. Blackburn, manager, Paul D. Close, technical secretary, 111 West Washington Street, Chicago, Ill. 472.93; 473.3.

Interstate School Building Service, Ray L. Hamon, director, George Peabody College for Teachers, Nashville, Tenn. 437.; 613.3; 613.6.

Intercollegiate Association of Amateur Athletes of America, c/o American Sports Publishing Company, 45 Rose Street, New York, N.Y. 069.1; 943.94.

Internal Combustion Engine Institute, E. F. Deacon, secretary, 408 Continental Building, Dallas, Texas. 705.0.

International Acetylene Association, H. F. Reinhard, secretary, 30 East Forty-second Street, New York, N.Y. 600.5; 767.

International Association of Electrical Inspectors, V. H. Tousley, secretary, 612 N. Michigan Avenue, Chicago, Ill. 710.; 715.30.

International Association of Electrotypers & Stereotypers, Inc., A. P. Schloegel, field secretary, 949 Leader Building, Cleveland, Ohio. 651.6; 651.9; 788.

International Association of Government Labor Officials, Isador Lubin, secretary, c/o Bureau of Labor Statistics, United States Department of Labor, Washington, D.C. 412.3; 605.27; 787.

International Association of Ice Cream Manufacturers, Robert C. Hibben, executive secretary, Barr Building, Washington, D.C. 491.; 788.2; 959.1; 959.9.

International Association of Industrial Accident Boards and Commissions, V. A. Zimmer, secretary-treasurer, c/o United States Department of Labor, Washington, D.C. 541.3; 712.0; 766.0; 783.; 784.0; 910.

International Association of Milk Dealers, Roscoe E. Little, executive secretary, 309 W. Jackson Boulevard, Chicago, Ill. 607.0; 646.51; 731.; 955.1.

International Association of Milk Sanitarians, Inc., C. Sidney Leete, secretary, State Department of Health, Albany, N.Y. 607.0; 646.51; 731.

International Municipal Signal Association, Inc., Irvin Shulsinger, secretary, 8 East Forty-first Street, New York 17, N.Y. 603.42; 646.32; 715.11; 715.41; 715.43; 715.44; 718.32; 718.5; 719.55; 719.61; 719.64.

Jewelry Crafts Association, Henry L. Sperling, executive secretary, 20 W. 47th Street, New York, N.Y. 661.

Laundry and Cleaners Allied Trades Association, Roger R. Jackson, manager, 95 Liberty Street, New York, N.Y. 787.

Lead Industries Association, Felix Edgar Wormser, secretary, 420 Lexington Avenue, New York 17, N.Y. 617.75; 617.79; 651.3; 651.8; 651.9.

Liquid Tight Paper Container Association, George J. Lincoln, Jr. secretary, 1532 Lincoln-Liberty Building, Philadelphia, Pa. 491.

Mahogany Association, Inc., George N. Lamb, secretary, 75 East Wacker Drive, Chicago, Ill. 411.43.

Malleable Founders' Society, Robert E. Belt, secretary, Union Commerce Building, Cleveland 14, Ohio. 534.12.

Manganese Track Society, R. E. Einstein, secretary, 301 South Main Street, East St. Louis, Ill. 606.3.

Manufacturers Standardization Society of the Valve and Fittings Industry, John J. Harman, general secretary, 420 Lexington Avenue, New York 17, N.Y. 603.21; 606.50; 607.0; 607.14; 607.2; 607.4; 607.6; 608.0; 611.21; 646.41; 646.50; 646.51.

Manufacturing Chemists' Association of the United States, Warren N. Watson, secretary, 608 Woodward Building, Washington, D.C. 532.21; 533.4; 607.6; 726.0; 821.3; 821.4; 821.5; 821.7; 831.1; 839.38; 846.50; 918.1; 918.2; 918.87; 919.4; 950.; 951.32; 955.2.

Maple Flooring Manufacturers Association, E. C. Singler, secretary, 332 South Michigan Avenue, Chicago 4, Ill. 411.25; 411.29; 518.56; 646.33.

Metal Cutting Tool Institute, Harry C. Hungerford, Secretary, 410 Asylum Street, Hartford, Conn. 615.15; 765.

Metal Lath Manufacturers Association, Arthur J. Tuscany, commissioner, Engineers Building, Cleveland 14, Ohio. 518.53; 605.24.

Metal Window Institute, Myron J. Jones, technical assistant, 1427 Eye Street N.W., Washington, D.C. 605.22.

Milk Cap Statistical Bureau, George J. Lincoln, Jr., executive secretary, Lincoln-Liberty Building, Philadelphia, Pa. 955.1.

Mine Inspectors' Institute of America, C. A. McDowell, secretary, 427 Park Street, California, Pa. 860.

Monorail Manufacturers Association, E. Donald Tolles, secretary-treasurer, 500 Fifth Avenue, New York 18, N.Y. 744.2; 745.1.

Multiple V-Belt Drive Association, Philip W. Upp, executive secretary, 140 South Dearborn Street, Chicago, Ill. 611.16.

National Aircraft Standards Committee *see* Aeronautical Chamber of Commerce of America, Inc.

National Association of Bedding Manufacturers, S. J. Mills, secretary, 808 South Dearborn Street, Chicago 5, Ill. 431.1; 813.11.

National Association of Building Owners and Managers, Robert B. Beach, executive secretary, 134 South La Salle Street, Chicago, Ill. 518.50; 518.51.

National Association of Dyers and Cleaners of the United States and Canada, J. M. Matson, managing executive, Silver Spring, Md. 061.7; 142.2; 202.44; 232.; 300.0; 360.; 370.; 392.0; 397.0; 399.9; 502.0; 503.2; 521.9; 532.9; 613.9; 802.1; 820.; 821.9; 830.; 871.7; 881.5; 918.87; 955.0; 982.3.

National Association of Fan Manufacturers, L. O. Monroe, secretary, 5-208 General Motors Building, Detroit, Mich. 791.1.

National Association of Furniture Manufacturers, A. P. Haake, managing director, 886 Lake Shore Drive, Chicago, Ill. 431.1; 813.1.

National Association of Hosiery Manufacturers, Earl Constantine, president, 488 Fourth Avenue, New York, N.Y. Max Schenke, director of research, National Bureau of Standards, Washington 25, D.C. 309.2; 504.35.

National Association of Ice Industries, Mount Taylor, executive secretary, 228 North La Salle Street, Chicago, Ill. 959.4.

National Association of Ice Refrigerator Manufacturers, E. G. Vail, secretary, 1708 L Street, N.W., Washington, D.C. 959.4.

National Association of Insecticide and Disinfectant Manufacturers, Inc., G. M. Baird, chairman, Specifications & Purchases Committee, Suite 1307, 110 East Forty-second St. New York, N.Y. 881.2; 881.9; 951.32; 955.1; 955.7.

National Association of Marble Dealers, R. H. Flint, president, 3208 Shields Avenue, Chicago, Ill. 511.3; 518.591

National Association of Master Plumbers of the United States, Jere L. Murphy, chairman, Standardization Committee, 340 East Forty-fourth Street, New York, N.Y. 532.23; 800.6; 812.21.

National Association of Mutual Casualty Companies, J. M. Eaton, secretary, 919 North Michigan Avenue, Chicago, Ill. 787.

National Association of Pipe Nipples Manufacturers, H. A. Long, Jr., secretary, 501 Fifth Avenue, New York, N.Y. 645.4.

National Association of Printers' Roller Manufacturers, H.H. Colehower, Jr., secretary, c/o Godfrey Roller Company, Philadelphia, Pa. 788.

National Association of Purchasing Agents, George A. Renard, executive secretary, 11 Park Place, New York 7, N.Y. 022.1; 041.1; 041.4; 042.1; 042.2; 043.1; 043.2; 046.; 051.; 061.2; 061.7; 088.3; 069.9; 093.0; 093.7; 095.; 097.; 098.1; 099.5; 101.1; 102.3; 103.1; 106.1; 107.0; 107.1; 109.9; 121.3; 126.11; 131.1; 142.1; 142.2; 142.3; 142.4; 142.5; 142.6; 142.8; 142.91; 142.99; 143.1; 143.2; 151.1; 152.1; 152.2; 153.1; 154.11; 154.12; 154.23; 154.8; 160.; 162.; 163.1; 175.4; 175.9; 200.; 201.0; 201.9; 207.1; 207.3; 211.1; 214.; 216.; 217.; 231.; 232.; 234.; 291.; 293.; 294.; 295.; 296.2; 296.4; 300.0: 301.3; 302.10; 302.39; 304.0; 320.; 322.1; 326.; 330.; 331.18; 331.22; 331.4; 341.1; 341.2; 349.20; 349.4; 349.5; 382.9; 368.2; 370.; 372.0; 373.20; 397.0; 400.20; 400.21; 400.23; 400.24; 400.26; 400.27; 400.29; 400.30; 400.33; 400.35; 400.39; 401.15; 401.16; 401.17; 401.31; 401.34; 401.38; 401.6; 402.1; 414.1; 429.9; 470.1; 472.31; 472.32; 474.9; 478.21; 489.; 501.0; 501.1; 501.2; 501.6; 503.3; 503.4; 504.0; 504.40; 504.54; 505.11; 512.10; 515.0; 518.19; 517.0; 521.1; 521.2; 531.0; 531.2; 531.3; 531.6; 531.7; 532.22; 534.12; 541.0; 541.9; 545.1; 548.; 552.; 571.; 574.; 575.1; 575.2; 591.; 592.; 800.2; 602.1; 603.0; 603.1; 603.21; 603.23; 803.32; 603.41; 605.0; 608.1; 807.10; 807.14; 607.3; 807.4; 607.8; 611.0; 811.21; 611.3; 611.41; 611.50; 811.52; 815.12; 815.15; 815.81; 615.83; 621.11; 821.22; 621.24; 621.25; 621.28; 621.30; 822.3; 622.6; 631.0; 631.32; 831.43; 632.1; 833.1; 634.; 635.; 841.0; 642.23; 842.24; 844.0; 644.21; 845.11; 645.23; 645.24; 646.0; 851.0; 851.8; 852.0; 853.0; 854.1; 654.51; 855.0; 656.0; 881.; 681.0; 683.0; 891.1; 692.1; 693.1; 695.1; 698.; 707.40; 715.41; 715.44; 719.52; 766.2; 801.2; 801.4; 802.1; 802.2; 803.10; 803.24; 811.; 813.2; 816.11; 818.19; 816.35; 821.1; 821.3; 821.5; 821.8; 821.7; 821.9; 822.2; 822.9; 823.; 824.; 831.1; 832.3; 832.9; 833.2; 833.9; 834.3; 834.4; 834.5; 834.8; 834.8; 834.9; 835.9; 838.1; 838.3; 838.5; 838.6; 838.7; 838.9; 839.1; 839.2; 839.32; 839.35; 839.38; 839.39; 839.49; 839.8; 839.7; 839.8; 839.9; 840.1; 841.49; 842.1; 842.4; 842.83; 842.7; 846.0; 848.50; 848.59; 846.82; 846.83; 847.3; 848.2; 848.4; 850.; 882.; 871.9; 881.19; 881.9; 893.0; 893.8; 931.1; 932.2; 932.5; 933.0; 953.2; 953.30; 957.19; 957.2; 982.3.

National Association of Sheet Metal Distributors, George A. Fernley, secretary-treasurer, 505 Arch Street, Philadelphia, Pa. 604.20; 604.31; 605.22; 807.4; 607.5; 842.7.

National Association of Silo Manufacturers, Z. W. Craine, secretary, Box 30, Norwich, N.Y. 111.7.

National Association of Waste Material Dealers, Inc., Chas. M. Haskins, managing director, Times Building, New York, N.Y. 201.2; 319.4; 390.5; 400.50; 470.1; 600.2.

National Association of Wool Manufacturers, Walter Humphreys, secretary, 80 Federal Street, Boston 10, Mass. 041.3; 142.1; 385.19; 369.21; 369.29; 504.9.

National Basketball Committee, c/o A. S. Barnes and Company, Publishers, 67 West 44th Street, New York, N.Y. 069.1; 943.1; 943.97.

National Board of Boiler and Pressure Vessel Inspectors, C. O. Myers, secretary, Brunson Building, 145 North High Street, Columbus, Ohio. 607.0; 767.

National Board of Fire Underwriters, W. E. Mallalieu, general manager, 85 John Street, New York 7, N.Y. 130.; 518.50; 518.51; 518.55; 518.56; 518.59; 518.9; 532.22; 605.23; 807.0; 607.4; 607.6; 614.0; 614.3; 614.4;

614.9; 704.0; 705.0; 710.; 711.10; 711.20; 711.25; 712.2; 713.1; 713.5; 714.11; 714.12; 714.22; 714.30; 714.41; 714.42; 714.51; 714.52; 715.11; 715.12; 715.21; 715.30; 715.41; 715.42; 715.44; 715.50; 716.11; 716.15; 716.16; 716.31; 716.32; 717.0; 717.3; 718.0; 718.30; 718.32; 718.61; 722.1; 722.2; 726.0; 726.1; 745.3; 753.1; 755.0; 756.; 767.; 785.1; 787.; 791.0; 792.0; 840.2; 840.6; 893.0; 911.2; 912.; 950.; 954.21; 956.1; 956.2; 959.9; 970.; 973.4; 973.5; 974.0; 974.2; 974.4; 976.; 997.2; 997.4; 997.5.

National Building Granite Quarries Association, J. J. McGuire, president, 101 Park Avenue, New York 17, N.Y. 511.1.

National Bureau of Casualty and Surety Underwriters, Wm. Leslie, general manager, 60 John Street, New York, N.Y. 722.39; 766.0.

National Canners Association, Carlos Campbell, director, Division of Statistics, 1739 H Street N.W., Washington 6, D. C. 125.0; 126.0; 127.0; 128.0; 134.0; 160.; 281.; 953.2; 959.1.

National Canvas Goods Manufacturers Association, James E. McGregor, executive secretary, 224 Endicott Building, St. Paul 1, Minn. 319.91; 319.98.

National Coffee Association, W. F. Williamson, secretary, 120 Wall Street, New York, N.Y. 953.2.

National Collegiate Athletic Association, c/o A. S. Barnes & Company, 67 W. 44 Street, New York 18, N.Y. 068.1; 069.1; 209.91; 209.92; 429.9; 518.73; 943.1; 943.2; 943.7; 943.91; 943.94; 943.95; 943.96; 943.97; 943.99.

National Concrete Burial Vault Association, J. R. Van Meter, secretary-treasurer, 2553 Cummins Street, Cincinnati 25, Ohio. 959.3.

National Concrete Masonry Association, E. W. Dienhart, asst. secretary, 33 West Grand Avenue, Chicago, Ill. 516.4; 518.80; 518.89.

National Conference on Street and Highway Safety, A. W. Koehler, secretary, c/o National Association of Motor Bus Operators, Tower Building, Washington, D. C. 718.5; 998.

National Conference on Uniform Traffic Accident Statistics, Dr. Halbert L. Dunn, chairman, Bureau of the Census, Washington 25, D.C. 700; 718.5.

National Conference on Weights and Measures, R. W. Smith, secretary, c/o National Bureau of Standards, United States Department of Commerce, Washington 25, D.C. 793.0; 950.

National Conservation Bureau, Julien H. Harvey, managing director, 60 John Street, New York, N.Y. 068.0; 722.32; 722.33; 722.35; 722.36; 784.0; 797.0; 914.0.

National Cottonseed Products Association, Inc., S. M. Harmon, secretary, Sterick Building, Memphis, Tenn. 112.2; 112.3; 126.11; 135.5; 141.; 142.0; 142.4; 142.6; 143.2; 301.3; 871.0.

National Council on Compensation Insurance, Wm. F. Roeber, general manager, 45 E. 17th St., New York, N.Y. 910.

National Crushed Stone Association (Inc.) A. T. Goldbeck, engineering director, 1735 Fourteenth Street N.W., Washington 9, D.C. 784.0.

National District Heating Association, John F. Collins, Jr., secretary-treasurer, 827 North Euclid Avenue, Pittsburgh 6, Pa. 600.1; 792.0; 882.0.

National Door Manufacturers Association, Inc., S. O. Hall, secretary-manager, 332 South Michigan Avenue, Chicago, Ill. 400.41; 423.1; 423.2.

National Electrical Contractors Association, Laurence W. Davis, secretary, 420 Lexington Avenue, New York, N.Y. 715.30; 715.44.

National Electrical Manufacturers Association W. J. Donald, managing director, C. M. Cogan, manager, Engineering Department, 155 East Forty-fourth Street, New York, N.Y. 532.22; 552.; 642.9; 701.2; 710.; 711.10; 711.11; 711.12; 711.20; 711.21; 711.22; 711.23; 711.42; 713.1; 713.2; 713.4; 713.5; 714.11; 714.21; 714.22; 714.30; 714.41; 714.42; 714.50; 714.51; 714.52; 715.11; 715.12; 715.13; 715.21; 715.30; 715.34; 715.40; 715.41; 715.44; 715.49; 715.51; 717.1; 717.2; 718.60; 718.65; 719.50; 719.51; 719.52; 719.56; 719.58; 719.63; 719.72; 721.1; 722.2; 744.2; 767.; 959.4.

National Electrical Wholesalers Association, E. Donald Tolles, managing director, 165 Broadway, New York, N.Y. 715.30.

National Elevator Manufacturing Industry, Inc., John McArdle, commissioner, 101 Park Avenue, New York 17, N.Y. 745.3.

National Fire Protection Association, Percy Bugbee, general manager, Robert S. Moulton, technical secretary, 60 Batterymarch Street, Boston 10, Mass. 202.41; 411.20; 500.; 502.2; 503.0; 503.4; 505.0; 518.50; 518.51; 518.59; 518.71; 605.12; 605.23; 607.0; 607.6; 613.9; 614.0; 614.3; 614.9; 615.72; 703.0; 703.9; 704.0; 705.0; 717.3; 718.30; 718.32; 722.1; 722.2; 724.0; 725.3; 725.40; 725.42; 750.; 755.1; 756.; 767.; 784.0; 785.1; 787.; 789.; 791.0; 800.0; 840.2; 840.5: 860.; 865.: 881.30; 893.0; 911.2; 915.30; 956.2; 970.; 973.4; 973.5; 974.0; 974.2; 976.; 997.2; 997.4; 997.5.

National Football League, Official Guide, (Published by American Sports Publishing Co., 45 Rose Street, New York, N.Y.) 069.1; 943.1; 943.91.

National Founders Association, Jeffrey M. Taylor, secretary, 120 South La Salle Street, Chicago, Ill. 768.

National Furniture Warehousemen's Association, R. J. Wood, secretary, 1018 S. Wabash Avenue, Chicago, Ill. 954.36.

National Hardwood Lumber Association, John W. McClure, secretary-treasurer, Suite 2408, 59 East Van Buren Street, Chicago 5, Ill. 400.30; 413.29; 413.52; 726.1.

National Hay Association, Inc., Fred K. Sale, secretary-treasurer, 600 Board of Trade Building, Indianapolis, Ind. 111.1; 111.2; 111.3; 111.4; 111.5; 111.6; 111.91; 111.92; 111.93; 111.94; 111.95; 111.96; 111.97; 111.98; 111.99; 113.1; 113.2; 113.3.

National Kraut Packers Association, Roy Irons, secretary, Main Street, Clyde, Ohio. 125.1.

National Lime Association, W. Vernon Brumbaugh, secretary, 927 Fifteenth Street N.W., Washington, D.C. 514.4; 516.2; 516.3; 843.5.

National Lubricating Grease Institute, George W. Miller, executive secretary, 498 Winspear Avenue, Buffalo, 15, N.Y. 504.0; 504.40.

National Lumber Manufacturers Association, Frank J. Hanrahan, structural engineer, 1319 - 18th Street N.W., Washington, D. C. 400.0; 400.1; 400.2; 400.20; 400.21; 400.22; 400.23; 400.24; 400.25; 400.26; 400.27; 400.28; 400.30; 400.31; 411.0; 411.25; 411.26; 412.0; 412.1; 413.0; 413.52; 423.0; 429.9; 402.52; 518.50; 531.6.

National Machine Tool Builders' Association, Tell Berna, general manager, 10525 Carnegie Avenue, Cleveland, Ohio. 541.3; 608.31; 608.32; 615.15; 761.1; 765.

National Metal Compartment Association, C. F. Burt, executive secretary, 440 Terminal Tower Building, Cleveland, Ohio. 617.79.

National Oak Flooring Manufacturers' Association, Inc., Henry H. Willins, secretary-treasurer, 830 Dermon Building, Memphis, Tenn. 411.25; 411.26; 411.29.

National Paint, Varnish and Lacquer Association, Inc., Henry A. Gardner, director, Scientific Section (also director, Institute of Paint and Varnish Research), 1500 Rhode Island Avenue, N.W., Washington, D.C. 840.1.

National Paperboard Association, H. S. Adler, secretary, 80 East Jackson Boulevard, Chicago, Ill. 470.1; 472.0; 472.93.

National Paving Brick Association, W. H. Cullimore, engineer-secretary, 1756 K Street, N.W., Washington, D.C. 505.15; 512.12; 512.13; 518.35; 534.10; 534.11.

National Preservers Association, Inc., W. Lowe Walde, managing director, 839 Seventeenth Street N.W., Washington 6, D.C. 523.4; 955.4.

National Ready Mixed Concrete Association, V. P. Ahearn, executive secretary, and Stanton Walker, director of engineering, Munsey Building, Washington, D.C. 516.3; 742.

National Research Council, Ross G. Harrison, chairman, 2101 Constitution Avenue, Washington, D.C. 500.

National Restaurant Association, F. J. Wiffler, secretary, 666 Lake Shore Drive, Chicago, Ill. 489.; 532.1.

National Retail Dry Goods Association, Lew Hahn, general manager, 101 West Thirty-first Street, New York, N.Y. 369.21; 532.20; 612.0; 617.70; 932.2; 953.2; 957.2.

National Safety Council, W. H. Cameron, managing director, 20 North Wacker Drive, Chicago, Ill. 069.3; 200.; 413.9; 429.4; 470.9; 518.50; 605.22; 607.0; 700.; 751.; 760.; 770.; 782.; 783.; 910.; 979.1; 993.; 998.

National Sand and Gravel Association, V. P. Ahearn, executive secretary, and Stanton Walker, director of engineering, Munsey Building, Washington 4, D.C. 511.73; 512.10; 512.2; 516.0; 518.30.

National Scale Men's Association, Harry Mayer, president, c/o Chicago and Northwestern Railway, Chicago, Ill. 793.5.

National School Supplies and Equipment Association, L. E. Parmenter, executive secretary, Palmer House, Chicago, ILL. 437.; 438.3; 937.4.

National Slag Association, H. J. Love, managing director, Earle Building, Washington, D.C. 512.2; 516.0.

National Soybean Processors Association, Edward J. Dies, president, 3818 Board of Trade Building, Chicago, Ill. 112.6; 143.2.

National Terrazzo and Mosaic Association (Inc.), Theodore L. Medford, executive secretary, 1420 New York Avenue N.W., Washington, D.C. 511.3.

National Tuberculosis Association, Dr. Charles E. Lyght, director of Health Education, 1790 Broadway, New York 19, N.Y. 810.

National Warm Air Heating and Air Conditioning Assoication, George Boeddener, managing director, 145 Public Square, Cleveland 14, Ohio. 792.0.

National Wholesale Druggists Association, E. L. Newcomb, executive vice-president, 330 W. 42nd Street, New York, N.Y. 612.12; 712.1.

National Wholesale Hardware Association of the United States, George A. Fernley, secretary, 505 Arch Street, Philadelphia, Pa. 604.20; 604.26; 604.31; 604.32; 605.22; 607.4; 607.5; 642.7.

National Wooden Box Association, C. D. Hudson, manager, 308 Barr Building, Washington, D.C. 953.37.

Natural Gasoline Association of America, William F. Lowe, secretary, 923 Kennedy Building, Tulsa 3, Okla. 503.0; 503.3; 504.50; 793.0; 839.40.

New England Cotton Buyers Association, H. G. Brooks, president, 60 Batterymarch Street, Boston, Mass. 300.1.

New England Manufacturing Jewelers and Silversmiths Assn., Edward O. Otis, executive secretary, Providence Biltmore Hotel, Providence, R. I. 662.; 663.

New England Water Works Association, Frank J. Gifford, secretary, 613 Statler Building, Boston, Mass. 607.10.

New York Produce Exchange, Lloyd V. Juan, secretary, 2 Broadway, New York, N.Y. 019.2; 043.0; 043.1; 102.1; 142.1; 142.3; 142.4; 142.5; 142.6; 142.7; 142.8; 142.92; 143.2; 154.23; 504.54; 848.2; 848.4.

Non-Ferrous Hot Water Tank Manufacturers Association, F. Richmond Fletcher, secretary, c/o McKinsey & Co., 75 Federal Street, Boston, Mass. 614.2; 614.4.

Non-Ferrous Ingot Metal Institute, R.D.T. Hollowell, secretary, 308 West Washington Street, Chicago, Ill. 643.0; 644.11; 646.11; 647.11; 655.1.

Northeastern Lumber Manufacturers Assn., Inc., R. E. Broderick, secretary, 271 Madison Avenue, New York, N.Y. 400.23; 400.26; 400.28.

Northern Hemlock and Hardwood Manufacturers Association, O. T. Swan, secretary, Oshkosh, Wisconsin. 400.21; 400.24; 400.25; 400.26; 400.28; 400.29; 400.39; 401.6; 401.9; 402.43; 402.51; 402.52; 411.1; 411.24; 411.3; 411.43; 411.5; 411.6; 412.0.

Northern Pine Manufacturers' Association, W. A. Ellinger, secretary, 4438 Wentworth Avenue, Minneapolis 9, Minn. 400.23; 400.25; 400.26; 400.28; 400.39.

Northwest Canners Association, E. M. Burns, secretary, 513 Board of Trade Building, Portland, Ore. 126.11; 126.13; 126.3; 127.1; 127.2; 132.11; 132.22; 132.42; 132.45; 134.11; 134.21; 134.22; 134.42; 134.45.

Oil-Heat Institute of America, (Inc.), C. F. Curtin, secretary, 30 Rockefeller Plaza, New York, N.Y. 503.4; 614.9.

Open Steel Flooring Institute, Inc., Stuart J. Swensson, secretary-treasurer, 1611 First National Bank Building, Pittsburgh, Pa. 605.22; 619.9.

Optical Society of America, A. C. Hardy, secretary, Mass. Inst. of Technology, Boston, Mass. 476.34; 788.; 911.0; 911.2; 911.3; 911.4; 911.5; 911.6; 912.

Outdoor Advertising Association of America, H. E. Fisk, general manager, 165 Wacker Drive, Chicago, Ill. 998.

Pacific Coast Building Officials Conference, Hal Colling, secretary, 124 West Fourth Street, Los Angeles, Calif. 516.50.

Package Research Laboratory, E. A. Srill, Rockaway, New Jersey, 603.4; 606.13; 953.30; 953.39.

Painting and Decorating Contractors of America, G. S. Stuart, secretary, Brown Building, Philadelphia 6, Pa 640.1.

Paper Mill Wire Cloth Manufacturers' Association, A. M. Ferry, secretary, 1427 Eye Street N.W., Washington 5, D. C. 645.39.

Paper Stationery and Tablet Manufacturers Association, Inc., Edgar P. Eaton, executive secretary, 527 Fifth Avenue, New York, N.Y. 481.

Philippine Mahogany Manufacturers Import Association, G. P. Purchase, assistant secretary, 111 S. Seventh Street, Los Angeles, Calif. 411.43.

Pin, Clip, and Fastener Association, Thomas B. Jordan, executive secretary, Trinity Court Building, 74 Trinity Place, New York, N.Y. 612.15; 619.8; 645.9; 932.5.

Pipe Fittings Manufacturers Association, J. L. Giacomino, assistant secretary, 22 E. 40th Street, New York, N.Y. 607.14; 607.2; 645.4; 646.51.

Plain Washer Manufacturers' Association, Eugene Caldwell, secretary, 2100 South Bay Street, Milwaukee, Wisconsin. 606.31; 606.6; 645.6; 722.36.

Pneumatic Automotive Equipment Association, Pittsburgh, Pa. 791.2.

Porcelain Enamel Institute, Inc., Edw. Mackasek, 1010 Vermont Ave., N.W., man. dir. Washington 5, D.C. 531.6; 532.20; 532.9.

Portland Cement Association, 33 West Grand Avenue, Chicago 10, Ill. 511.3; 514.5; 516.0; 516.2; 516.3; 516.5; 518.31; 518.32; 518.33; 518.38; 518.39; 516.42; 518.51; 518.52; 518.56; 518.66; 516.68; 840.1.

Radio Manufacturers Association, Bond Geddes, general manager, 1317 F. Street N.W., Washington 4, D.C. 606.2; 712.1; 712.2; 712.9; 713.1; 713.5; 713.6; 714.12; 714.52; 715.22; 715.30; 715.35; 716.14; 718.60; 716.61; 716.62; 716.64; 718.66; 718.69; 718.7.

Rail Steel Bar Association, H. P. Bigler, director, 228 North La Salle Street, Chicago, Ill. 516.0.

Railway Tie Association, Roy M. Edmonds, secretary-treasurer, 610 Shell Building, St. Louis 3, Mo. 401.10; 401.11; 401.12; 401.13; 401.14; 401.15; 401.16; 401.17; 401.18.

Red Cedar Shingle Bureau, W. W. Woodbridge, secretary-manager, G. A. Brewer, assistant manager, 5508 White Building, Seattle 1, Wash. 402.52.

Resistance Welder Manufacturers Association, George A. Fernley, secretary, 505 Arch Street, Philadelphia, Pa. 603.26; 767.

Rolled Gold Platers' Association, Clarence M. Dunbar, president, c/o Horton Angell Company, Attleboro, Mass. 662.

Rubber Manufacturers Association (Inc.), Warren S. Lockwood, executive vice president, 444 Madison Avenue, New York 22, N.Y. 201.1; 202.0; 202.11; 202.12; 202.21; 202.31; 202.41; 202.42; 202.43; 202.45; 202.46; 202.9; 204.6; 207.0; 207.1; 207.2; 207.3; 208.1; 611.16.

Rubber Reclaimers Association, Allyn I. Brandt, president, 537 E. 86th Street, New York, N.Y. 201.2.

Safe Manufacturers National Association, A. O. Boniface, executive secretary, 366 Madison Avenue, New York 17, N.Y. 518.59; 605.22; 613.5; 613.7; 954.21; 958.9.

Safety Equipment Manufacturers Association, Inc., R. S. Armstrong, manager, 350 Madison Avenue, New York, N.Y. 716.12; 716.13; 997.1.

Salt Producers Association, W. G. Wilcox, chairman, Standardization Committee, 154 Bagley Avenue, Detroit 26, Mich. 950.

Sanitary Brass Institute, J. W. McGarry, chairman, Commercial Standards Committee, Chase Brass and Copper Company, Waterbury, Conn. 532.23; 612.21.

Sanitary Cast Iron Enameled Ware Association, C. W. Carbeau, secretary, South Second Street, Ellwood City, Pa. 532.23; 612.20; 612.21.

Sanitary Institute of America, E.D. Szold, secretary, 105 West Monroe Street, Chicago, Ill. 319.4; 390.5.

Society of Automotive Engineers, (Inc.), John A. C. Warner, secretary and general manager, 29 West Thirty-ninth Street, New York 18, N.Y. 066.7; 066.9; 069.9; 200.; 201.0; 201.1; 201.9; 202.11; 202.43; 202.46; 202.9; 209.99; 319.97; 349.25; 365.98; 396.; 425.9; 472.93; 477.9; 481.; 502.2; 503.0; 503.1; 503.2; 503.3; 504.0; 504.34; 504.9; 518.59; 521.0; 541.3; 545.5; 593.; 600.1; 600.2; 600.3; 600.5; 602.2; 603.0; 603.21; 603.23; 603.27; 603.41; 604.43; 604.0; 604.22; 604.23; 604.24; 604.25; 604.29; 605.0; 606.4; 607.0; 607.14; 607.4; 607.6; 607.7; 608.0; 608.2; 608.30; 608.31; 608.32; 608.4; 608.51; 608.52; 608.53; 608.6; 611.0; 611.11; 611.21; 611.51; 615.12; 615.15; 615.82; 621.0; 621.30; 621.31; 621.32; 621.34; 622.3; 622.4; 622.5; 622.6; 622.9; 631.0; 631.11; 631.13; 631.21; 631.22; 631.23; 631.24; 631.31; 631.32; 631.33; 631.41; 631.42; 631.43; 631.6; 631.9; 633.0; 640.; 641.21; 642.12; 642.24; 642.4; 643.0; 643.9; 644.12; 644.21; 644.22; 644.23; 645.11; 645.12; 645.21; 645.24; 645.32; 645.39; 645.9; 646.12; 646.23; 646.31; 646.41; 646.42; 646.52; 647.12; 647.13; 647.15; 647.16; 647.25; 647.26; 647.32; 647.34; 647.36; 647.38; 651.0; 653.0; 656.2; 656.3; 656.4; 656.6; 656.7; 681.0; 683.0; 683.41; 692.0; 692.1; 692.2; 692.3; 693.0; 693.1; 693.2; 693.3; 695.1; 695.2; 695.4; 695.5; 695.6; 697.3; 704.1; 705.0; 705.6; 707.11; 707.12; 707.13; 707.15; 707.16; 712.0; 712.2; 714.21; 715.11; 715.35; 715.41; 716.12; 719.3; 719.4; 722.0; 722.1; 722.30; 722.31; 722.32; 722.33; 722.34; 722.37; 722.38; 722.39; 723.0; 724.20; 724.21; 724.22; 724.23; 724.24; 724.25; 724.26; 724.29; 725.3; 729.2; 729.5; 755.3; 765.; 766.2; 793.1; 801.2; 839.38; 840.6; 843.31; 844.1; 844.4; 847.1; 849.6; 893.9; 919.1; 935.; 950.; 959.6; 974.0; 993.

Society of Motion Picture Engineers, Harry Smith, Jr., executive secretary, Sylvan Harris, editor and office manager, Hotel Pennsylvania, New York 1, N.Y. 518.50; 518.54; 518.80; 911.0; 911.1; 911.2; 911.3; 911.6; 911.9; 912.

Society for the Promotion of Engineering Education, F. L. Bishop, secretary, University of Pittsburgh, Pittsburgh, Pa. 700.; 706.0; 718.40; 724.0; 910.

Southeastern Peanut Association, J. B. Latimer, executive secretary, 100 N. Washington Street, Albany, Ga. 112.2; 119.9; 135.5; 142.6.

Southern Cypress Manufacturers Association, B. R. Ellis, secretary, 721-24 Barnett National Bank Building, Jacksonville, Fla. 400.22; 402.52; 413.1.

Southern Hardwood Producers, Inc., Ed. R. Linn, secretary-manager, 805 Sterick Building, Memphis, Tenn. 411.43.

Southern Pine Association, H. C. Berckes, secretary-manager, Canal Building, New Orleans, La. 400.26.

Southern Pine Inspection Bureau, A. S. Boisfontaine, secretary, Canal Building, New Orleans, La. 400.26; 402.41; 402.42; 402.43; 402.51; 402.52; 411.0; 411.1; 411.27; 411.3; 411.41; 411.42; 411.43; 411.5; 411.6; 411.7; 411.9; 412.1; 413.0; 413.24; 413.8; 423.5.

Sporting Arms and Ammunition Manufacturers' Institute, C. S. Comeaux, secretary, 103 Park Avenue, New York 17, N.Y. 619.1.

State of California, Dept. of Public Health, Bureau of Food and Drug Inspection, Sacramento, Calif. 173.

Steel Heating Boiler Institute, M. L. Heminway, executive secretary, 336 Madison Avenue, New York 17, N.Y. 614.4; 703.0; 703.1.

Steel Joist Institute, P. E. Griffith, secretary, 200 North Wells Street, Chicago, Illinois. 605.12.

Steel Kitchen Cabinet Institute, S. S. Kenney, executive secretary, 1256 Donald Avenue, Lakewood 7, Ohio. 613.9.

Sterling Silversmiths Guild of America, Alexander Vincent, secretary, 20 W. 47th Street, New York, N.Y. 691.2.

Stoker Manufacturers Association, Marc G. Bluth, secretary, 307 North Michigan Avenue, Chicago, Ill. 614.0; 614.9.

Structural Clay Products Institute, Harry C. Plummer, director of Engineering and Research, 1756 K Street N.W., Washington, D. C. 516.3; 518.30; 518.80; 518.83; 518.89; 534.0; 534.10; 534.11; 534.22.

Sun Glass Institute, Inc., A. C. Boniface, executive secretary, 366 Madison Avenue, New York, N.Y. 914.1.

Tag Manufacturers Institute, Frank H. Baxter, executive director, 370 Lexington Avenue, New York, N.Y. 302.39; 308.9; 326.; 379.1; 474.5; 489.

Tanners' Council of America, J. Louis Nelson, secretary, 100 Gold Street, New York, N.Y. 060.; 066.7.

Technical Association of the Pulp and Paper Industry, R. G. Macdonald, secretary, 122 East Forty-second Street, New York 17, N.Y. 093.2; 099.5; 216.; 349.6; 400.14; 400.5; 400.50; 400.7; 401.6; 470.1; 470.2; 470.3; 470.4; 471.1; 471.3; 473.2; 476.4; 477.; 477.9; 501.0; 503.3; 511.2; 517.2; 571.; 607.0; 622.5; 701.0; 793.4; 803.10; 810.; 821.7; 824.; 830.; 833.9; 834.4; 834.8; 838.2; 839.49; 839.9; 842.1; 843.6; 882.0; 891.; 919.1; 957.2.

Telephone Group, H. L. Huber, secretary, 195 Broadway, New York 7, N.Y. 401.30; 401.31; 401.32; 401.34; 401.36; 611.12.

Textile Color Card Assn. of the U.S., Inc., Margaret Hayden Rorke, secretary and managing director, 200 Madison Ave., New York 16, N.Y. 067.0; 300.0; 306.0; 309.2; 365.0; 367.0; 370.; 395.20; 397.0.

Tile Manufacturers' Association (Inc.), G. M. Gilroy, president, 50 East Forty-second Street, New York, N.Y. 518.56; 518.73; 534.20; 534.25.

Tire and Rim Association, Inc., C. E. Bonnett, general manager, 305 Peoples Bank Building, Corner Main and Exchange Streets, Akron, Ohio. 206.0; 206.1; 206.2; 206.3; 206.4; 206.5; 615.82; 616.35; 722.36; 724.23; 725.2; 743.

Tissue Association, Ross A. Fife, executive secretary, 122 E. 42nd Street, New York, N.Y. 476.31; 476.32; 476.4.

Toilet Goods Association, C. S. Welch, executive secretary, 30 Rockefeller Plaza, New York, N.Y. 048.; 502.2; 504.54; 504.6; 546.; 821.2; 823.; 834.3; 839.38; 839.39; 839.9.

Tubular Plumbing Goods Institute, Robert S. Booth, secretary, 74 Trinity Place, New York 8, N.Y. 645.4.

Underwear Institute, Roy A. Cheney, president, 2 Park Avenue, New York, N.Y. 302.10; 309.4; 312.1; 312.5; 312.8; 387.2; 871.0; 953.2.

Underwriters' Laboratories, Inc., Alvah Small, president, 207 East Ohio Street, Chicago 11, Ill. 202.21; 202.32; 202.41; 208.95; 385.98; 429.4; 505.18; 505.38; 518.4; 518.50; 518.54; 532.22; 803.43; 804.31; 805.22; 805.23; 807.2; 807.4; 807.8; 613.5; 813.9; 814.0; 814.3; 814.9; 817.21; 817.9; 642.24; 845.4; 705.4; 707.40; 711.10; 711.23; 711.25; 713.5; 713.7; 714.11; 714.21; 714.22; 714.41; 714.42; 714.51; 714.52; 715.11; 715.12; 715.13; 715.21; 715.22; 715.30; 715.34; 715.40; 715.41; 715.42; 715.43; 715.44; 715.51; 718.12; 718.18; 718.31; 718.32; 718.39; 717.0; 717.1; 718.31; 718.35; 718.5; 718.84; 719.50; 719.72; 722.0; 722.39; 722.95; 723.0; 745.3; 787.; 785.0; 785.1; 789.; 792.0; 792.1; 792.3; 793.0; 793.2; 793.8; 797.; 797.0; 839.49; 941.; 951.64; 958.2; 959.1; 959.4; 970.; 970.1; 973.2; 973.3; 973.4; 974.2; 978.; 997.1; 997.5.

United Roofing Contractors' Association, James McCawley, secretary, 53 West Forty-sixth Street, New York, N.Y. 505.18; 505.38.

United States Golf Association, Charles W. Littlefield, counsel, 1 Wall Street, New York, N.Y. 209.91; 943.1; 943.93.

United States Pharmacopoeial Convention, Inc., E. Fullerton Cook, chairman, Committee of Revision of the Pharmacopoeia of the United States of America, Forty-third Street and Woodland Avenue, Philadelphia, Pa. 042.2; 043.1; 043.2; 043.21; 045.; 048.; 047.; 093.7; 154.11; 154.42; 154.51; 154.52; 161.1; 161.4; 181.7; 182.; 164.2; 171.; 204.12; 211.4; 212.; 214.; 218.; 217.; 281.; 398.1; 398.21; 398.24; 398.25; 398.31; 501.8; 503.1; 504.8; 548.; 546.50; 652.; 801.4; 802.1; 802.2; 803.24; 803.25; 803.29; 810.; 811.; 812.; 813.1; 813.2; 813.3; 813.4; 813.5; 813.8; 813.8; 813.9; 814.1; 814.2; 815.1; 815.2; 815.3; 818.11; 818.12; 818.13; 818.14; 816.15; 818.18; 816.17; 816.19; 818.21; 818.22; 818.31; 818.32; 818.33; 818.34; 818.35; 818.38; 816.37; 816.38; 818.39; 816.41; 818.42; 818.43; 818.44; 818.45; 818.48; 818.47; 818.49; 818.51; 818.52; 818.53; 816.54; 818.59; 818.81; 818.64; 817.11; 817.12; 817.13; 817.2; 817.21; 817.22; 817.23; 817.24; 817.25; 817.28; 817.29; 817.31; 817.32; 817.33; 817.51; 817.52; 817.53; 817.54; 817.55; 817.58; 817.57; 817.59; 817.81; 817.82; 817.63; 817.7; 818.1; 818.11; 818.12; 818.13; 818.14; 818.15; 818.16; 818.17; 818.18; 818.19; 818.2; 818.21; 818.22; 818.23; 818.30; 818.31; 818.33; 818.34; 818.39; 818.41; 818.42; 818.43; 818.44; 818.45; 818.48; 818.47; 818.49; 818.51; 818.52; 818.53; 818.54; 818.55; 818.58; 818.57; 818.59; 818.8; 818.81; 818.82; 818.83; 818.64; 818.65; 818.86; 818.87; 818.88; 818.89; 818.70; 818.71; 818.72; 818.73; 818.74; 818.75; 818.78; 818.77; 818.79; 818.82; 318.91; 818.95; 819.1; 819.4; 819.5; 819.6; 819.70; 819.71; 819.72; 819.73; 819.74; 819.75; 819.89; 819.9; 821.1; 821.2; 821.3; 821.5; 821.7; 821.9; 822.1; 822.4; 822.9; 823 ; 824.; 831.1; 831.3; 831.4; 832.2; 832.3; 832.4; 832.9; 833.2; 833.3; 833.4; 833.5; 833.9; 834.3; 834.4; 834.5; 834.8; 834.9; 835.9; 838.3; 838.4; 838.9; 837.2; 838.1; 838.2; 839.1; 839.3; 839.31; 839.33; 839.34; 839.35; 839.38; 839.37; 839.38; 839.39; 839.41; 839.43; 839.45; 839.7; 839.9; 882.; 871.3; 872.1; 882.4; 915.55; 915.56.

United States Shellac Importers Association, Inc., George E. Ashby, secretary, 155 John Street, New York, N.Y. 846.11; 848.82.

United States Volley Ball Association Guide, (Published by A. S. Barnes & Co., 87 West 44th Street, New York, N.Y.) 089.1; 317.7; 943.1; 943.99.

Valves Manufacturers Association, George A. Cooper, assistant secretary, 22 E. 40th Street, New York, N.Y. 807.8; 846.41.

Varnished Tubing Association, Stewart N. Clarkson, secretary, 420 Lexington Avenue, New York, N.Y. 719.50.

Veneer Association, Charles E. Close, secretary, 818 South Michigan Avenue, Chicago 5, Ill. 413.50.

Vitreous China Plumbing Fixtures Association, Stanley S. Backner, secretary, P.O. Box 498, Camden, N.J. 532.23; 812.21; 918.0.

Webbing Manufacturers Institute, Wilwyn Herbert, secretary, 309 State Street, New London, Conn. 394.5.

West Coast Lumberman's Association, W. B. Greeley, secretary-manager, 364 Stuart Building, Seattle, Wash. 400.0; 400.20; 400.21; 400.23; 400.24; 400.25; 400.28; 400.28; 401.14; 401.34; 402.1; 402.42; 402.43; 402.51; 411.0; 411.1; 411.21; 411.23; 411.24; 411.28; 411.3; 411.41; 411.42; 411.43; 411.8; 411.9; 412.0; 413.0; 413.1; 413.4; 413.6; 413.8; 413.9; 423.0; 423.1; 423.2; 423.5.

Western Pine Association, S. V. Fullaway, Jr., secretary-manager, Yeon Building, Portland, Oregon. 400.0; 400.21; 400.23; 400.25; 400.26; 400.28; 402.51; 411.0; 411.1; 411.23; 411.8; 412.0; 413.0; 413.1; 413.20.

Western Red and Northern White Cedar Association, W. H. Jones, secretary, 715 Peyton Building, Spokane, Washington. 400.43; 401.21; 401.31; 401.41.

Writing Paper Manufacturers Association, M.C. Dobrow, executive secretary, 122 E. 42nd Street, New York, N.Y. 390.5; 478.10.

UNITED STATES GOVERNMENT

Army Air Forces—Address: Headquarters, Air Technical Service Command, Wright Field, Ohio. 081.8; 081.7; 081.9; 065.1; 088.7 087.1 067.8 087.8 088.2 089.5 073. 093.2 093.8; 201.1; 201.3; 201.9; 202.10; 202.11; 202.22; 202.32; 202.43; 202.9; 204.92; 208.2; 208.4; 298.2; 303.8; 303.99; 308.24; 306.32; 308.38; 308.9; 311.1; 311.4; 311.6; 311.8; 311.98; 315.19; 315.2; 315.9; 319.97; 319.98; 319.99; 331.18; 349.25; 349.7; 385.18;

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Army-Navy Aeronautical—Address; Bureau of Aeronautics, Navy Department, Washington 25, D.C. 061.2; 061.7; 069.3; 069.4; 142.2; 201.1; 202.22; 202.32; 202.40; 202.43; 202.9; 204.92; 206.2; 206.4; 209.7; 282.; 296.4; 302.22; 302.49; 306.24; 306.36; 311.1; 311.6; 319.97; 319.98; 331.3; 362.9; 365.98; 366.2; 373.21; 374.2; 379.1; 392.3; 392.4; 393.; 394.5; 394.6; 395.12; 395.15; 396.; 397.16; 397.2; 397.3; 400.13; 400.15; 413.31; 413.32; 413.52; 477.6; 477.9; 479.2; 461.; 482.; 485.; 489.; 503.2; 503.3; 504.19; 504.23; 504.37; 504.44; 504.49; 504.6; 505.36; 521.6; 525.3; 525.9; 531.6; 541.6; 593.; 600.1; 600.3; 600.5; 603.23; 603.26; 603.41; 603.42; 604.19; 604.22; 605.23; 607.0; 607.4; 607.6; 607.7; 608.0; 608.2; 608.32; 608.6; 608.7; 608.6; 615.42; 616.23; 616.99; 619.4; 621.31; 621.32; 622.1; 622.3; 622.4; 622.9; 631.21; 631.22; 631.23; 631.24; 631.32; 631.33; 631.35; 631.41; 631.42; 631.9; 634.; 644.12; 645.11; 645.9; 647.12; 647.13; 647.15; 656.2; 656.3; 656.4; 656.6; 656.7; 671.; 672.; 683.49; 692.0; 692.3; 695.2; 695.3; 695.4; 695.5; 695.6; 704.0; 705.6; 707.13; 707.15; 707.16; 707.29; 710.; 711.12; 711.22; 712.2; 713.2; 713.5; 714.11; 714.12; 714.14; 714.31; 714.33; 714.41; 714.42; 714.51; 714.52; 715.12; 715.35; 715.40; 715.41; 715.42; 715.43; 715.49; 716.19; 716.2; 716.30; 716.39; 718.60; 718.7; 719.3; 719.4; 719.72; 719.94; 722.1; 724.0; 724.20; 724.21; 724.22; 724.24; 724.25; 724.26; 724.27; 724.29; 724.3; 725.3; 755.0; 755.1; 755.2; 755.3; 767.; 793.2; 793.6; 794.; 797.2; 601.2; 801.8; 821.9; 822.2; 822.3; 833.5; 822.9; 839.38; 639.43; 640.5; 640.6; 842.1; 842.4; 842.5; 842.7; 642.82; 842.86; 842.9; 843.31; 843.39; 843.9; 844.1; 844.4; 844.7; 846.21; 846.51; 846.53; 846.54; 846.59; 846.63; 847.1; 648.2; 848.9; 649.19; 849.9; 882.3; 893.4; 893.5; 893.6; 893.9; 911.2; 911.4; 914.5; 916.1; 916.22; 916.9; 919.3; 935.; 943.8; 950.; 953.2; 953.36; 956.1; 956.2; 959.1; 959.6; 959.9; 993.

Civil Aeronautics Board, Address: Dept. of Commerce, Civil Aeronautics Board, Washington 25, D.C. 724.0; 724.21; 724.24; 724.25; 724.27; 724.3.

Department of Agriculture, Circulars and Bulletins, Address: Department of Agriculture, Inquiries and Distribution Service, Administration Building, Washington 25, D.C. 240.; 730.; 640.1.

Department of Agriculture, Forest Service, Washington 25, D.C. 069.2; 069.3; 202.41; 202.46; 202.9; 204.23; 209.99; 302.45; 303.0; 304.94; 314.1; 315.12; 315.5; 319.3; 319.96; 319.99; 369.21; 395.29; 399.2; 413.52; 428.29; 429.9; 433.2; 471.3; 472.0; 481.; 482.; 503.3; 504.51; 518.51; 518.59; 541.3; 605.23; 607.6; 612.14; 612.29; 614.3; 614.9; 615.22; 615.61; 615.62; 616.11; 616.15; 616.17; 616.60; 616.62; 616.99; 617.62; 617.63; 671.; 681.41; 707.13; 711.11; 712.1; 715.36; 715.44; 716.13; 716.2; 716.32; 718.21; 718.60; 722.1; 722.2; 722.39; 729.2; 732.; 736.; 741.3; 741.4; 755.1; 755.2; 755.3; 788.; 833.1; 643.3; 846.0; 863.; 869.; 693.5; 914.2; 914.5; 915.43; 916.22; 916.8; 919.3; 919.84; 919.9; 944.1; 951.64; 953.1; 953.9; 954.1; 956.2; 957.1; 957.3; 957.9; 956.9; 959.1; 959.5; 964.2; 979.; 979.1; 996.

Department of Agriculture, Rural Electrification Administration, Washington 25, D.C. 401.30; 401.31; 401.34; 401.36.

Department of Agriculture, War Food Administration, Office of Distribution, Washington 25, D.C. 001.2; 002.; 003.; 007.1; 007.2; 007.3; 007.4; 007.5; 007.6; 011.1; 011.8; 012.1; 012.91; 014.1; 014.3; 015.1; 015.2; 015.4; 015.5; 015.6; 015.7; 015.8; 019.1; 021.2; 021.7; 022.1; 022.45; 051.; 100.; 101.1; 102.3; 103.1; 103.5; 104.1; 105.1; 106.1; 107.1; 111.0; 111.1; 111.4; 111.5; 111.6; 111.91; 111.92; 111.93; 111.95; 111.99; 113.1; 113.2; 113.3; 113.4; 113.5; 121.1; 121.2; 121.3; 121.4; 121.5; 121.7; 121.8; 121.9; 122.11; 122.13; 122.14; 122.2; 122.3; 122.4; 122.5; 122.7; 123.1; 123.2; 123.3; 123.4; 123.51; 123.52; 123.6; 123.8; 124.1; 124.2; 124.3; 124.4; 124.5; 125.1; 125.5; 125.9; 126.11; 126.12; 126.13; 126.14; 126.2; 126.5; 126.6; 126.7; 127.1; 127.2; 127.52; 128.1; 128.3; 129.11; 129.12; 131.22; 131.23; 131.24; 131.25; 131.26; 131.3; 131.4; 131.5; 132.11; 132.13; 132.21; 132.22; 132.3; 132.41; 132.42; 132.44; 132.45; 133.12; 133.13; 133.21; 133.22; 133.41; 133.44; 133.45; 134.11; 134.21; 134.22; 134.24; 134.25; 134.41; 134.42; 134.44; 134.45; 134.52; 134.55; 134.56; 135.5; 135.6; 135.7; 141.; 154.13; 162.; 164.1; 176.1; 176.3; 176.5; 178.6; 176.7; 211.1; 216.; 259.; 261.; 294.; 300.0; 300.1; 331.22; 360.; 952.11; 952.12; 952.19; 952.2.

Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington 25, D.C. 722.0.

Department of Commerce, Civil Aeronautics Administration, Washington 25, D.C. 206.2; 401.2; 401.30; 401.40; 411.9; 435.2; 516.39; 516.50; 518.53; 516.59; 532.20; 600.6; 605.23; 607.0; 613.4; 613.5; 613.6; 615.9; 619.3; 619.9; 704.1; 711.10; 713.4; 713.5; 714.11; 714.41; 714.51; 714.52; 715.30; 715.41; 715.51; 716.30; 717.1;

718.1; 716.35; 716.39; 716.43; 716.5; 716.60; 716.61; 716.62; 718.63; 716.64; 716.65; 718.69; 718.7; 722.0; 722.1; 722.2; 722.33; 723.0; 723.13; 724.0; 724.21; 724.26; 724.29; 729.5; 755.1; 765.1; 791.1; 796.; 914.2; 916.0; 917.1; 918.9; 970.; 973.2.

Department of Commerce, National Bureau of Standards, Washington 25, D.C. 021.0; 040.; 066.6; 067.0; 100.; 126.13; 160.; 161.; 200.; 202.0; 202.42; 204.12; 204.33; 204.4; 204.52; 206.0; 206.1; 206.5; 206.1; 211.3; 217.; 281.; 296.2; 300.4; 300.6; 302.10; 302.36; 302.40; 302.45; 303.1; 304.2; 304.71; 306.21; 308.2; 309.2; 309.3; 309.4; 310.0; 311.5; 312.3; 315.0; 315.10; 315.5; 319.3; 319.98; 326.; 331.10; 331.20; 331.21; 331.22; 341.2; 365.0; 365.96; 365.97; 367.2; 369.21; 373.; 375.2; 390.4; 391.; 392.12; 392.21; 392.23; 392.3; 392.4; 394.5; 397.0; 396.21; 396.31; 398.34; 400.0; 400.12; 400.20; 401.30; 402.1; 402.43; 402.52; 411.0; 411.23; 411.25; 411.26; 411.27; 411.42; 411.43; 411.9; 412.0; 413.0; 413.1; 413.52; 413.54; 413.9; 423.1; 423.3; 426.1; 428.29; 429.1; 429.9; 431.11; 437.; 438.3; 470.1; 470.2; 470.3; 471.3; 472.0; 472.25; 472.31; 472.32; 472.36; 472.93; 473.3; 473.4; 475.4; 476.21; 476.31; 476.32; 476.4; 477.5; 476.34; 476.35; 479.2; 481.; 489.; 494.; 497.1; 503.0; 503.2; 503.4; 504.0; 505.0; 505.15; 505.16; 505.17; 507.; 511.2; 511.50; 511.51; 511.52; 512.10; 512.14; 513.; 514.0; 515.0; 516.0; 516.3; 516.4; 516.9; 517.2; 516.50; 516.51; 516.53; 516.56; 516.59; 518.63; 518.60; 516.83; 516.69; 520.; 521.0; 521.7; 522.; 523.4; 526.9; 527.; 531.0; 532.1; 532.20; 532.22; 532.23; 534.10; 534.11; 534.12; 534.22; 534.23; 534.25; 541.0; 541.3; 541.4; 545.2; 545.3; 545.5; 591.; 592.; 600.1; 600.2; 600.3; 600.4; 600.6; 601.1; 603.0; 603.42; 603.43; 603.50; 604.20; 604.26; 604.31; 604.32; 605.12; 605.22; 605.23; 605.24; 605.25; 606.1; 607.0; 607.14; 607.2; 607.3; 607.4; 607.5; 607.6; 608.0; 606.11; 608.2; 608.30; 608.31; 606.32; 608.7; 612.0; 612.11; 612.12; 612.20; 612.21; 612.29; 613.1; 613.3; 613.5; 613.6; 613.9; 614.1; 614.2; 614.3; 614.4; 614.9; 615.11; 615.13; 615.15; 615.2; 615.21; 615.42; 615.55; 615.61; 615.62; 615.63; 615.82; 615.9; 616.11; 616.33; 616.61; 616.62; 616.63; 616.64; 616.8; 616.91; 617.0; 617.12; 617.21; 617.23; 617.41; 617.43; 617.75; 617.79; 619.1; 619.2; 619.9; 621.21; 621.22; 621.24; 621.25; 621.26; 621.27; 622.9; 631.0; 631.11; 631.41; 641.0; 642.23; 642.25; 642.7; 642.9; 643.9; 644.21; 645.39; 645.4; 646.41; 646.51; 646.52; 647.20; 651.0; 651.9; 653.0; 656.0; 656.7; 661.; 662.; 663.; 672.; 661.0; 683.0; 663.5; 691.0; 691.2; 692.0; 692.1; 692.2; 693.1; 695.1; 701.3; 703.1; 704.0; 705.0; 707.47; 710.; 711.10; 711.20; 711.24; 711.42; 712.1; 712.2; 713.5; 714.11; 714.12; 714.21; 714.41; 714.42; 714.51; 714.52; 715.21; 715.22; 715.30; 715.36; 715.39; 715.40; 715.41; 715.44; 715.49; 715.50; 715.51; 716.12; 716.13; 716.31; 716.32; 717.3; 716.0; 716.60; 719.60; 719.62; 719.63; 721.1; 722.32; 722.36; 722.39; 726.1; 726.2; 729.1; 729.6; 741.3; 741.4; 743.; 744.1; 745.0; 745.3; 765.; 766.2; 767.; 770.; 784.0; 785.0; 785.1; 765.2; 787.; 791.2; 792.0; 792.3; 793.0; 793.1; 793.5; 793.6; 793.7; 800.0; 602.1; 602.2; 609.1; 610.; 621.7; 821.9; 622.4; 622.5; 630.; 832.4; 833.9; 834.9; 838.1; 839.0; 839.9; 640.1; 642.1; 844.67; 844.9; 646.59; 652.; 871.0; 871.13; 661.0; 661.2; 881.5; 881.9; 893.4; 911.1; 911.2; 914.1; 914.5; 915.10; 915.25; 915.30; 915.51; 915.56; 915.59; 916.21; 916.0; 918.2; 916.9; 919.1; 919.4; 919.60; 919.83; 932.2; 933.0; 937.1; 937.4; 950.; 951.10; 951.12; 951.32; 951.72; 952.11; 953.2; 953.32; 953.37; 954.1; 955.1; 955.4; 955.7; 956.1; 956.2; 957.2; 959.1; 959.4; 959.6; 959.9; 974.0; 961.0; 982.2; 962.3; 983.1; 993.; 997.1; 997.2.

Dept. of Interior, Bureau of Mines, Washington 25, D.C. 750.

Dept. of Interior, Bureau of Reclamation, Washington 25, D.C. 516.3.

Dept. of Interior, General Land Office, Washington 25, D.C. 916.5.

Department of Interior, Purchasing Office, Washington 25, D.C. 001.1; 001.2; 205.5; 435.3; 605.23; 611.17; 612.22; 612.3; 613.1; 614.9; 619.3; 631.5; 717.2; 722.0; 722.1; 722.37; 729.2; 729.3; 729.5; 731.; 732.; 741.3; 741.4; 741.5; 742.; 743.; 744.2; 755.1; 767.; 766.; 769.; 791.2; 691.; 915.27; 915.36; 915.39; 915.43; 916.22; 916.5; 921.; 959.1; 959.4.

Dept. of Labor, Division of Labor Standards, Washington 25, D.C. 516.50; 700.; 716.30; 760.0; 766.0; 767.; 764.; 766.; 792.0; 821.0.

Federal Housing Administration, Washington 25, D.C. 518.0; 516.50; 516.9; 600.6;

Federal Security Agency, Food and Drug Administration, Washington 25, D.C. 019.2; 019.9; 021.2; 021.4; 021.5; 021.6; 021.7; 022.42; 022.45; 022.49; 037.1; 100.; 107.3; 107.4; 109.6; 109.7; 125.1; 125.5; 125.9; 126.11; 126.13; 126.14; 126.2; 126.5; 126.7; 127.1; 127.2; 127.3; 127.4; 127.51; 127.52; 127.7; 128.1; 128.2; 128.3; 128.9; 129.12; 134.22; 134.41; 134.42; 134.44; 134.51; 134.52; 134.53; 134.55; 134.56; 142.91;

Federal Specifications—Address: Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. 007.0; 007.1; 007.2; 007.3; 007.4; 011.1; 011.2; 011.4; 011.5; 011.6; 011.6; 011.92; 011.93; 012.1; 012.2; 012.3; 012.5; 012.6; 012.92; 012.96; 014.1; 014.3; 015.1; 015.2; 015.4; 015.5; 015.6; 015.7; 015.6; 018.11; 018.12; 016.13; 016.14; 016.15; 018.19; 018.21; 018.22; 016.23; 016.24; 016.25; 016.29; 016.5; 016.9; 019.1; 021.1; 021.2; 021.3; 021.5; 021.6; 021.7; 022.1; 022.3; 022.45; 022.49; 031.; 034.; 035.2; 035.3; 035.4; 035.6; 036.1; 036.2; 036.3; 036.5; 037.1; 037.2; 037.4; 041.3; 041.4; 043.1; 043.2; 043.3; 046.; 061.7; 063.6; 066.1; 066.2; 066.3; 066.4; 066.6; 066.7; 066.6; 066.9; 068.5; 069.3; 069.4; 069.7; 069.9; 092.1; 093.2; 093.3; 093.6; 093.7; 097.; 100.; 101.1; 102.2; 102.3; 103.1; 103.3; 103.4; 103.5; 104.1; 105.1; 106.1; 107.1; 107.3; 107.4; 108.1; 108.2; 106.3; 106.41; 108.42; 106.43; 108.44; 108.9; 109.2; 109.3; 109.4; 109.5; 109.6; 109.7; 109.9; 111.0; 111.1; 111.4; 111.5; 111.6; 111.91; 111.92; 111.93; 111.94; 111.95; 111.99; 112.1; 112.2; 112.3; 112.5; 112.6; 113.9; 117.2; 116.1; 116.2; 116.3; 116.9; 119.1; 119.4; 119.9; 121.1; 121.2; 121.3; 121.4; 121.5; 121.7; 121.8; 121.9; 122.11; 122.13; 122.2; 122.3; 122.4; 122.5; 122.6; 122.7; 123.1; 123.2; 123.3; 123.4; 123.51; 123.52; 123.6; 124.1; 124.2; 124.4; 125.1; 125.5; 125.9; 126.11; 126.13; 126.2; 126.6; 126.7; 127.1; 127.2; 127.52; 128.1; 128.3; 129.11; 129.12; 129.13; 129.20; 131.1; 131.22; 131.23; 131.25; 131.26; 131.3; 131.4; 131.5; 132.11; 132.13; 132.22; 132.3; 132.41; 132.42; 132.43; 132.44; 132.45; 133.12; 133.13; 133.21; 133.22; 133.41; 133.44; 133.45; 134.11; 134.21; 134.22; 134.24; 134.25; 134.41; 134.42; 134.44;

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Federal Works Agency, Public Roads Administration, Washington 25, D.C. 401.9; 402.2; 402.9; 411.0; 505.16; 505.17; 505.36; 511.72; 512.10; 512.15; 516.10; 516.11; 516.12; 518.14; 516.22; 516.23; 516.24; 518.25; 516.26; 518.26; 518.29; 516.34; 516.38; 516.41; 516.42; 516.56; 518.61; 516.62; 516.64; 516.65; 516.76; 518.61: 518.82; 516.83; 516.65; 516.69; 516.9; 531.5; 603.43; 605.19; 605.21; 605.22; 605.25; 605.26; 607.11; 607.5; 622.9; 642.9; 646.59; 844.67.

Federal Works Agency, Public Works Administration, Washington 25, D.C. 412.2; 516.3; 516.5; 516.9; 516.32; 516.33; 516.34; 516.35; 516.41; 605.11.

Government Printing Office, Washington 25, D.C. 471.1; 472.13; 472.32; 472.36; 474.3; 474.5; 475.1; 475.5; 475.6; 475.72; 475.74; 477.2; 477.4; 478.11; 476.13; 476.16; 476.19; 476.22; 476.31; 476.33; 479.2; 479.4.

Interstate Commerce Commission, Bureau of Locomotive Inspection, Washington 25, D.C. 469.; 701.3; 704.0; 705.0; 721.1; 722.0; 722.1; 660.; 950.; 951.12; 951.13; 951.21; 951.31; 951.32; 951.33; 951.34; 951.43; 951.44; 951.46; 951.61; 951.62; 951.64; 951.72; 952.11; 952.2; 953.2; 953.36; 953.39; 954.1; 954.21; 954.36; 954.5; 955.2; 955.7; 956.1; 956.2; 957.19; 957.2; 956.3; 959.; 959.6.

Joint Army-Navy — Address: Navy Department, Bureau of Supplies and Accounts, Washington 25, D. C. 206.0; 306.36; 311.3; 311.4; 311.92; 317.9; 319.97; 341.1; 367.1; 395.29; 413.52; 428.3; 477.6; 477.9; 479.2; 461.; 526.1; 532.22; 607.0; 607.6; 612.22; 612.23; 612.29; 619.2; 621.31; 644.23; 645.9; 707.15; 711.23; 712.1; 713.1; 714.12; 714.31; 714.33; 714.39; 714.52; 715.41; 716.64; 716.69; 719.51; 719.54; 719.56; 719.61; 796.; 797.2; 639.9; 691.; 693.5; 893.6; 693.9; 911.2; 911.9; 912.; 915.52; 916.22; 917.2; 916.84; 923.; 932.9; 935.; 950.; 951.13; 951.32; 951.33; 951.44; 951.64; 953.2; 953.36; 954.1; 959.1; 975.

Marine Corps — Address: Headquarters, Marine Corps, Navy Department, Washington 25, D.C. 064.1; 066.3; 066.6; 067.1; 067.2; 067.8; 066.2; 069.2; 069.3; 069.4; 069.5; 069.7; 069.9; 203.4; 302.44; 302.45; 302.49; 303.0; 303.1; 303.3; 303.5; 303.7; 303.92; 303.95; 304.4; 304.5; 304.6; 304.71; 306.15; 306.19; 306.21; 306.23; 306.24; 306.32; 306.33; 306.34; 306.36; 306.44; 306.45; 308.9; 309.4; 310.0; 311.1; 311.3; 311.4; 311.5; 311.6; 311.6; 311.92; 311.93; 311.94; 311.96; 311.99; 312.1; 315.14; 315.2; 315.31; 317.3; 317.6; 317.9; 319.1; 319.7; 319.92; 319.97; 319.96; 319.99; 333.9; 342.1; 365.11; 365.12; 365.13; 365.14; 365.16; 365.16; 365.19; 365.21; 365.23; 365.26; 365.27; 365.29; 365.93; 365.96; 365.97; 365.96; 367.1; 367.4; 367.5; 367.7; 368.1; 366.2; 366.4; 366.5; 366.62; 369.1; 369.21; 369.22; 369.6; 373.1; 373.22; 373.25; 373.26; 374.1; 379.3; 392.51; 392.54; 394.1; 394.2; 394.6; 395.11; 395.13; 395.14; 395.15; 395.17; 395.19; 395.21; 395.29; 397.14; 397.16; 397.19; 399.1; 399.2; 399.3; 399.9; 429.2; 429.9; 479.2; 516.59; 603.43; 611.54; 611.59; 612.11; 612.14; 612.16; 612.22; 612.29; 612.3; 613.1; 613.5; 615.32; 615.63; 616.15; 616.16; 616.92; 616.99; 619.1; 631.9; 645.39; 645.9; 671.; 672.; 681.41; 766.; 601.2; 843.34; 843.39; 844.65; 844.9; 691.; 912.2; 915.39; 916.22; 919.3; 919.69; 919.9; 925.3; 932.5; 932.6; 933.9; 935.; 944.1; 944.3; 944.4; 944.6; 951.24; 953.2; 953.36; 953.39; 955.1; 956.2; 957.13; 957.15; 957.19; 959.1; 959.9; 962.3; 992.

Navy Department — Address: Bureau of Supplies and Accounts, Navy Department, Washington 25, D.C. 041.1; 046.; 066.2; 066.7; 066.9; 067.1; 067.6; 066.2; 069.3; 069.4; 069.9; 093.2; 143.2; 201.9; 202.11; 202.12; 202.13; 202.21; 202.22; 202.31; 202.32; 202.41; 202.42; 202.46; 202.9; 203.12; 203.2; 204.12; 204.24; 204.26; 204.29; 204.6; 204.92; 204.96; 206.1; 206.95; 209.99; 211.3; 215.; 261.; 293.; 296.2; 296.9; 301.2; 301.4; 301.6; 302.31; 302.32; 302.39; 302.44; 302.45; 302.49; 303.1; 303.2; 304.2; 304.4; 304.71; 304.93; 306.15; 306.2; 306.21; 306.24; 306.25; 306.27; 306.28; 306.31; 306.36; 306.1; 306.2; 306.7; 306.9; 309.3; 311.1; 311.3; 311.4; 311.5; 311.6; 311.7; 311.93; 311.94; 312.1; 314.3; 315.10; 315.11; 315.14; 315.4; 316.1; 316.2; 316.3; 319.1; 319.3; 319.7; 319.91; 319.92; 319.93; 319.94; 319.97; 319.96; 319.99; 330.; 331.11; 331.16; 331.21; 331.22; 333.2; 339.53; 341.2; 342.1; 342.2; 349.1; 349.20; 349.29; 362.9; 363.2; 365.16; 365.17; 365.16; 365.19; 365.21; 365.91; 365.93; 365.96; 365.96; 367.4; 367.6; 367.7; 368.2; 366.5; 366.62; 366.9; 369.1; 369.21; 369.3; 369.6; 369.9; 372.2; 373.1; 373.21; 373.24; 373.26; 375.1; 391.; 392.11; 392.53; 392.54; 392.7; 393.; 394.4; 394.5; 395.1; 395.13; 395.14; 395.16; 395.29; 397.15; 397.16; 397.19; 396.1; 399.1; 399.3; 399.5; 399.7; 399.9; 400.14; 400.21; 400.26; 400.29; 400.34; 400.37; 400.39; 400.49; 401.34; 401.39; 401.40; 401.5; 401.9; 402.91; 413.4; 414.1; 425.2; 425.3; 429.1; 429.2; 429.9; 435.5; 473.3; 473.4; 475.1; 476.21; 476.9; 479.2; 479.4; 461.; 469.; 494.; 497.1; 501.5; 501.9; 502.2; 503.2; 503.3; 503.4; 503.6; 504.19; 504.23; 504.43; 504.49; 504.6; 504.7; 504.6; 505.31; 506.; 515.; 516.19; 516.3; 516.4; 516.59; 521.6; 523.4; 523.9; 524.; 525.3; 526.6; 526.9; 527.; 526.; 531.3; 531.6; 532.21; 532.22; 532.23; 533.2; 533.3; 534.12; 534.25; 541.3; 541.4; 541.5; 545.2; 545.4; 545.6; 545.9; 552.; 575.1; 575.2; 575.3; 575.4; 593.; 600.1; 600.2; 600.3; 601.3; 602.2; 603.1; 603.21; 603.24; 603.26; 603.32 603.33; 603.41; 603.42; 603.43; 603.52; 603.59; 604.11; 604.14; 604.19; 604.20; 604.22; 604.23; 604.29; 604.32; 605.12; 605.15; 607.0; 607.14; 607.2; 607.3; 607.4; 607.6; 607.7; 606.2; 606.31; 606.32; 606.4; 606.51; 606.6; 606.7; 606.6; 606.9; 611.11; 611.17; 611.19; 611.21; 611.41; 611.49; 611.51; 611.54; 611.59; 612.11; 612.12 612.14; 612.22; 612.29; 612.3; 613.1; 613.3; 613.5; 613.6; 613.9; 614.1; 614.3; 614.9; 615.11; 615.12; 615.14; 615.15; 615.39; 615.42; 615.52; 615.54; 615.55; 615.61; 615.62; 615.63; 615.71; 615.72; 615.61; 615.62; 615.9; 616.16; 616.31; 616.35; 616.99; 617.12; 617.21; 617.22; 617.42; 617.43; 617.63; 617.79; 617.9; 619.2; 619.9; 621.11; 621.31; 621.32; 621.34; 621.39; 622.3; 622.4; 622.5; 622.6; 631.12; 631.13; 631.21; 631.22; 631.23; 631.31; 631.32; 631.33; 631.41; 631.42; 631.43; 631.5; 631.9; 634.; 635.; 635.1; 641.11; 641.12; 641.21; 641.22; 642.24; 642.5; 642.9; 643.3; 643.5; 644.12; 644.21; 645.11; 645.24; 645.31; 646.41; 647.13; 647.14; 647.15; 647.16; 647.17; 647.23; 647.24; 647.38; 651.1; 654.2; 654.3; 654.4; 654.51; 654.52; 654.53; 654.54; 656.2; 656.4; 656.6; 656.7; 671.; 672.; 673.; 661.1; 681.49; 663.2; 663.3; 663.41; 691.1; 692.1; 692.2; 693.1; 693.2; 693.3; 695.2; 695.3; 695.5; 695.6; 696.; 697.1; 697.2; 697.3; 702.9; 703.2; 703.3; 703.9; 705.2; 707.11; 707.13; 707.15; 707.21; 707.22; 707.23; 707.24; 707.25; 707.26; 707.29; 707.3; 707.41; 707.42; 707.43; 707.47; 707.49; 710.; 711.10; 711.21; 711.22; 711.24; 711.42; 712.2; 712.3; 712.9; 713.5; 713.6; 713.7; 714.11; 714.12;

714.14; 714.20; 714.21; 714.31; 714.34; 714.35; 714.36; 714.39; 714.41; 714.51; 714.52; 715.21; 715.41; 715.43; 715.44; 715.50; 716.13; 716.19; 716.2; 716.39; 717.1; 717.2; 718.29; 718.32; 718.33; 718.34; 718.39; 716.62; 716.7; 719.4; 719.51; 719.52; 719.56; 719.57; 719.58; 719.59; 719.99; 722.93; 722.94; 724.21; 724.22; 725.41; 725.42; 725.43; 729.3; 733.; 741.3; 742.; 744.2; 755.1; 755.3; 761.; 761.1; 761.2; 761.9; 762.1; 764.; 765.; 766.2; 767.; 775.; 784.1; 785.1; 786.; 789.; 791.1; 791.2; 792.1; 792.2; 793.2; 793.3; 793.4; 793.5; 793.6; 793.9; 794.; 797.1; 801.1; 601.2; 802.3; 803.12; 803.19; 803.32; 610.; 821.4; 821.7; 621.9; 822.3; 822.4; 823.; 631.9; 832.3; 832.4; 633.4; 834.2; 634.6; 834.8; 634.9; 836.9; 639.38; 639.39; 639.41; 639.43; 639.49; 639.9; 840.6; 841.8; 842.1; 842.4; 642.62; 842.7; 642.85; 842.86; 642.9; 843.31; 843.37; 643.39; 844.1; 844.4; 844.61; 644.62; 844.65; 844.66; 844.9; 846.61; 846.63; 846.9; 848.12; 848.9; 649.19; 649.2; 849.3; 849.4; 849.6; 649.9; 861.; 671.11; 871.12; 671.19; 871.26; 871.29; 871.5; 871.9; 681.15; 681.26; 881.29; 681.39; 661.9; 882.2; 682.4; 891.; 893.4; 893.5; 893.9; 911.6; 912.; 914.2; 914.4; 914.5; 914.9; 915.; 915.11; 915.13; 915.19; 915.26; 915.27; 915.29; 915.31; 915.33; 915.34; 915.36; 915.37; 915.39; 915.42; 915.43; 915.46; 915.56; 915.59; 916.22; 916.9; 917.2; 917.3; 918.1; 916.2; 918.3; 918.5; 918.6; 916.7; 918.66; 916.67; 918.9; 919.3; 919.4; 919.5; 919.6; 919.82; 919.64; 919.69; 919.9; 925.1; 925.4; 925.9; 929.; 931.1; 931.3; 931.5; 932.3; 932.5; 932.6; 932.9; 935.; 943.6; 943.6; 944.1; 944.3; 944.6; 951.64; 952.19; 953.1; 953.2; 953.36; 953.39; 953.9; 954.22; 954.29; 955.1; 955.2; 955.6; 956.1; 957.12; 957.15; 957.19; 957.2; 958.3; 956.9; 959.1; 959.3; 959.4; 959.5; 959.7; 959.8; 973.3; 962.2; 962.3; 982.4; 962.9; 983.; 983.2; 992.; 993.; 994.; 997.1.

Navy Dept., Bureau of Yards and Docks, Washington 25, D.C. 414.1; 423.1; 423.2; 425.2; 473.3; 505.15; 505.16; 505.36; 505.4; 511.3; 512.13; 512.14; 516.3; 518.12; 516.31; 516.53; 516.57; 516.59; 518.65; 518.9; 531.5; 532.9; 545.9; 600.6; 603.43; 605.22; 605.23; 611.12; 619.3; 711.20; 715.30; 716.32; 716.30; 744.1; 745.1; 745.3; 767.; 785.1; 792.0; 792.1; 792.2; 793.5; 956.2; 959.4.

Navy Dept., U. S. Coast Guard, Washington 25, D.C. 603.1; 603.21; 604.11; 604.19; 607.3; 607.4; 607.6; 608.31; 608.32; 608.4; 611.11; 611.21; 611.49; 611.59.

Panama Canal, Purchasing Dept., Washington 25, D.C. 401.46; 423.1; 524.; 604.32; 605.22; 607.6; 646.41; 671.; 711.21; 711.22; 713.5; 714.34; 715.41; 716.32; 717.1; 719.72; 723.15; 741.5; 742.; 744.2; 755.1; 755.3; 791.1; 791.2; 793.4; 793.6; 797.2; 644.9; 848.9; 863.; 951.32; 955.6; 959.3; 959.4; 961.62.

Post Office Department, Division of Motor Vehicle Service, Bureau of Fourth Asst. Postmaster General, Washington 25, D.C. 202.9; 362.3; 413.52; 521.6; 615.21; 615.32; 615.33; 616.17; 616.91; 712.1; 713.7; 715.41; 716.12; 722.31; 722.32; 722.37; 722.38; 722.39; 722.96; 722.97; 722.99; 729.3; 741.2; 761.1; 765.; 766.2; 767.; 764.1; 769.; 791.2; 843.39; 944.1; 944.5; 944.7; 951.65; 959.1; 962.3.

Public Health Service, Federal Security Agency, Rockville Pike, Bethesda, Md. 412.3; 532.23.

Treasury Dept., Federal Alcohol Administration, Washington 25, D.C. 173.

Treasury Department, Procurement Division, Washington 25, D.C. 019.0; 041.1; 067.6; 067.7; 069.3; 106.3; 154.22; 154.6; 203.2; 206.1; 207.3; 206.94; 209.5; 217.; 292.; 296.9; 302.45; 304.2; 304.4; 304.6; 304.71; 304.92; 304.93; 306.12; 306.14; 306.15; 306.16; 306.19; 306.21; 306.24; 306.31; 306.34; 306.35; 306.36; 308.9; 309.2; 311.96; 315.9; 317.3; 319.3; 319.4; 319.7; 319.99; 342.1; 349.1; 349.20; 364.; 365.12; 365.93; 369.21; 369.9; 392.4; 394.5; 395.27; 395.28; 397.11; 398.31; 398.34; 423.9; 429.2; 435.2; 435.3; 435.5; 436.; 436.3; 473.3; 476.21; 503.2; 504.44; 504.6; 504.7; 505.13; 505.15; 505.16; 505.19; 505.35; 505.36; 505.39; 514.2; 524.; 527.; 532.22; 532.23; 541.0; 541.3; 541.4; 545.6; 602.2; 603.0; 603.21; 603.23; 603.26; 603.31; 603.32; 603.43; 603.55; 604.23; 605.22; 605.27; 607.6; 608.14; 608.2; 608.31; 606.4; 608.6; 606.9; 611.51; 612.22; 613.3; 613.6; 613.9; 615.12; 615.14; 615.15; 615.74; 615.81; 616.13; 616.14; 616.17; 616.31; 616.61; 616.62; 616.99; 617.79; 617.9; 619.3; 619.6; 619.9; 621.31; 621.35; 645.9; 671.; 692.2; 707.25; 707.42; 707.44; 711.11; 711.23; 711.24; 712.2; 712.9; 715.41; 715.42; 715.44; 716.11; 716.18; 716.32; 717.1; 717.2; 719.51; 722.31; 722.32; 722.34; 722.39; 722.93; 722.94; 729.3.; 733.; 744.2; 767.; 775.; 786.; 788.; 791.1; 791.2; 794.; 797.0; 797.1; 801.2; 815.2; 821.2; 821.4; 821.7; 821.9; 822.5; 822.9; 624.; 630.; 831.2; 831.7; 832.1; 832.2; 832.4; 832.9; 833.1; 833.2; 833.5; 833.9; 834.2; 834.4; 834.8; 834.9; 837.1; 838.3; 839.33; 839.34; 839.36; 839.37; 839.41; 639.42; 639.43; 839.6; 639.9; 840.1; 842.63; 843.31; 843.37; 844.3; 844.67; 845.3; 846.59; 846.63; 647.1; 649.2; 849.6; 851.; 853.; 854.; 655.; 859.; 864.; 871.19; 881.11; 881.39; 881.5; 661.9; 691.; 693.0; 893.4; 911.9; 912.; 914.1; 914.4; 914.5; 915.19; 915.41; 915.42; 915.44; 915.46; 915.47; 915.59; 918.4; 916.9; 919.81; 919.85; 919.89; 931.3; 931.4; 932.2; 932.3; 932.4; 932.5; 932.6; 932.9; 933.2; 933.3; 935.; 936.; 944.5; 951.32; 953.39; 954.22; 954.23; 957.12; 957.19; 959.1; 959.4; 959.8; 973.2; 973.3; 973.4; 982.3; 982.9; 983.; 983.2; 984.; 993.; 994.

War Production Board, Conservation Div. — Address: War Production Board, Social Security Bldg., Washington 25, D.C. 412.0.

U. S. Army, Army Air Forces—Address: Commanding General, Materiel Command, Production Branch, Dept. 71, Wright Field, Dayton, Ohio. 061.3; 061.7; 065.2; 066.6; 067.1; 068.2; 069.3; 069.4; 093.2; 093.4; 202.32; 202.43; 203.12; 204.92; 208.5; 209.99; 302.45; 302.49; 303.1; 304.1; 306.36; 311.6; 311.92; 315.19; 319.97; 319.96; 331.14; 331.21; 349.20; 365.19; 367.7; 374.2; 394.5; 395.12; 395.15; 396.; 397.16; 400.36; 400.39; 413.1; 413.6; 425.2; 429.4; 478.34; 465.; 491.; 503.3; 504.43; 521.1; 525.2; 600.3; 603.34; 603.41; 603.42; 611.54; 614.3; 615.12; 621.31; 621.32; 631.40; 642.24; 656.3; 656.4; 656.7; 672.; 693.0; 693.3; 697.1; 705.4; 705.6; 707.15; 711.11; 711.12; 712.2; 713.2; 713.3; 713.5; 714.13; 714.21; 714.39; 714.52; 715.35; 715.41; 715.42; 715.49; 716.13; 716.16; 716.2; 716.32; 716.39; 717.1; 717.4; 719.56; 722.1; 722.37; 724.0; 724.1; 724.20; 724.23; 724.24; 724.26; 724.27; 724.29; 724.4; 725.3; 729.2; 729.5; 755.3; 601.1; 622.1; 832.9; 834.9; 839.39; 839.42; 839.9; 840.1; 844.4; 844.5; 846.51; 846.59; 846.9; 849.6; 893.9; 911.1; 911.2; 911.3; 911.4; 911.5; 911.6; 911.9; 912.; 914.9; 915.59; 919.4; 919.82; 919.89; 933.9; 953.36; 954.23; 956.1; 956.2; 957.13; 957.3; 958.2; 958.9; 973.2; 973.4; 993.

Names and Addresses of Standardizing Agencies

Army Regulations—Address: The Adjutant General, War Department, Washington 25, D.C. 067.0.

U. S. Army, Chemical Warfare Service—Address: Chief, Chemical Warfare Service, War Dept., Washington 25, D.C. 061.9; 069.9; 103.9; 163.1; 202.9; 204.12; 204.92; 303.95; 304.2; 319.91; 319.93; 365.96; 392.3; 392.4; 394.4; 394.5; 472.25; 503.2; 504.53; 504.54; 517.2; 525.9; 531.4; 571.; 593.; 603.41; 607.6; 642.9; 645.12; 645.9; 663.49; 707.13; 719.99; 751.; 791.1; 602.2; 614.2; 815.2; 621.9; 631.1; 631.9; 633.2; 633.3; 634.9; 636.5; 839.34; 639.38; 639.39; 839.41; 639.45; 639.6; 639.7; 639.9; 646.59; 860.; 893.4; 915.59; 916.9; 951.12; 951.32; 953.30; 953.36; 954.22; 954.29; 955.1; 955.9; 956.1; 957.2; 956.2; 959.1; 993.

U. S. Army, Corps of Engineers—Address: Office of Chief of Engineers, War Dept., Washington 25, D. C. 019.9; 043.1; 093.6; 216.; 217.; 317.9; 399.3; 400.0; 478.31; 476.32; 479.1; 510.; 512.11; 512.12; 512.2; 518.57; 533.1; 541.2; 541.5; 603.43; 605.23; 606.14; 612.11; 614.3; 615.12; 615.39; 616,14; 616.32; 616.33; 616.35; 616.5; 616.99; 617.9; 619.3; 705.3; 707.23; 711.24; 715.13; 715.36; 715.49; 716.2; 716.33; 727.; 732.; 741.4; 742.; 743.; 744.1; 744.2; 755.1; 793.1; 796.; 636.2; 640.6; 644.4; 644.9; 646.7; 649.7; 662.; 664.; 893.4; 914.9; 916.1; 916.21; 916.22; 916.4; 916.5; 916.6; 916.6; 916.9; 917.2; 919.3; 919.9; 932.1; 933.2; 935.; 936.; 953.1; 953.39; 954.21; 954.39; 954.4; 956.2; 957.13; 957.19; 956.1; 956.2; 959.1; 962.2.

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Cable rings, steel	719.61
Cable roller	719.61
Cable sewing twine	331.21
Cable shackles	603.42
Cable splicing bandage and sleeve	319.93,719.52
Cable supports	719.61
Cable tag	622.9,715.35
Cable tank thermometer	919.89
Cable-terminal and terminal lugs	715.35,722.32
Cable terminal splicing	715.40
Cable testing, gas pressure	715.40
Cable unit, battery unit	715.41
Cable vulcanizing kit	719.55,958.2
Cable wiping cloths	319.4
Cables (hemp, flax, ramie)	332.
Cacao	152.1,816.49,818.69
Cacao bean	151.0
Cacao butter	142.93,813.6
Cache, firetool, 100-man, portable	616.99
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Cactus grandiflous (night blooming Cereus) (medicinal)	616.59,816.79
Cadmium	834.
Cadmium anodes	834.
Cadmium chloride	839.39
Cadmium coating	600.3
Cadmium ingots	634.
Cadmium oxide	839.39
Cadmium plated steel bushings	600.3,603.24
Cadmium plating	600.3
Cadmium sulfate	839.39
Cadmium sulfid	833.9,839.39
Caffeine	611.
Caffeine and sodium benzoate	611.,817.29,819.82,834.9
Cage, pigeon training	954.39
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Cajuput oil	813.9
Cake, corn germ and corn oil	103.4
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Cake cutters	612.3
Cake mixtures	108.2
Cake pans	612,22,681.41
Cake turners	612.14,812.22
Cakes	108.2
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Calabar bean (medicinal	816.91
Calamine, prepared	839.38
Calamine liniment	617.39
Calamine lotion	617.83
Calamine ointment	817.59
Calamus	816.19
Calcimine	843.5
Calcimine brushes	982.2
Calcined gypsum (plaster of paris)	514.2,915.19
Calcium acetate of Hahnemann	833.9
Calcium aluminate	833.9
Calcium and calcium compounds, including lime	833.,833.9
Calcium and sodium glycerophosphates	616.67,833.9,834.9
Calcium arsenate	833.9,661.12
Calcium bromide	833.9
Calcium carbide	833.1
Calcium carbonate	817.12,619.83,833.3,841.6
Calcium carbonate of Hahnemann	833.2
Calcium chloride	505.29,516.3,833.0,833.2
Calcium chloride bags	957.19,957.2
Calcium chloride for roads	516.0,516.30
Calcium chloride freezing of coals	500.
Calcium chloride ice control practice (streets)	518.30
Calcium compounds	819.83
Calcium creosote	833.9
Calcium cyanide	833.9
Calcium fluorid	833.9
Calcium gluconate	617.29,833.9
Calcium glycerophosphate	833.9
Calcium hydrate	833.5
Calcium hydroxide	618.43,833.5
Calcium hypophosphite	833.9,839.31
Calcium iodid	833.9
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Calcium lactate	819.83,833.9
Calcium lactophosphate	816.69,818.69,833.9
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Calcium phosphate	833.4,833.9
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Calcium sulfate	833.9
Calcium sulfid, impure (medicinal)	833.9
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Calendered tag board	474.5
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Calf carcasses	011.1,011.8
Calf liver	011.4
Calfskin leather for gas masks	061.9
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Calking cotton	301.2
Calking irons	616.99
Calking lead	651.9
Calking tools	616.99
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Call-bell annunciators	716.33
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Calomel	617.53,819.62,619.84,839.36
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Camouflage paint, resin oil emulsion type........ 844.9
    primer........ 844.4
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Canned codfish and haddock........ 035.1
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Carbon brushes	711.42, 715.49, 982.6
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Potato mashers........429.1, 814.9, 681.49
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  Bain Marie, aluminum........ 831.5
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  brown bread........ 614.9
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  coffee........612.22, 612.29, 831.5
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  fire, gasoline........614.9, 615.72
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  french fry........ 612.22
  glue, copper........ 642.5
  glue, electric........711.24, 717.1
  fire, kerosene........ 615.72
  marking........612.29, 681.41
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Pouch, ammunition, shotgun........ 319.99
  canvas........ 399.3
  first aid packet........ 319.99
  gloves, rubber........ 204.52
  leather........ 069.7
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  live........007., 007.1
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Powdered soap........ 871.23
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    electric........704.1, 705.4, 710., 711., 713.4
    electric, gasoline, portable........705.4, 711.11
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Power transmission machinery	766.,786.9
Power units, radio	705.4,711.11,711.12,718.63
Pozzolana portland cement	518.11
Prairie hay	111.93
Precast concrete piles	518.42
Precast concrete slab crossings	518.31
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Precious metals, metal jewelry and plated ware	680-889
Precious stones and imitation stones	560-589
Precipitated chalk	548.,817.12,833.3
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Precision gears	611.55
Precision resistors	600.1,715.43
Prefabricated acoustical units	518.59
Prefabricated partition panels	518.53
Prefabricated wood	411.9
Preferred numbers	910.
Preferred voltage ratings	710.
Preformed block thermal insulation	296.2,707.49
Preformed expansion joint fillers	208.93,505.15,425.2
Preformed pipe covering insulation	296.2,707.49
Premolded expansion joints, method of test	505.15
Premolded joint fillers	505.15
Pre-oiling aircraft engines	704.0
Preparation of metallographic specimens	600.1
Prescription balance	793.5
Prescription book	481.
Prescription bottles	955.1
Prescription pad	915.59
Prescription scales and balances	793.5
Preservation and packaging, metal parts and equipment	504.23,724.20,950.
Preservation and packaging of aircraft turrets	954.36
Preservative lubricating oil	504.19
Preservative oils	504.9,505.33,801.3
Preservative solutions for wood	400.41
Preservative treatment of wood	400.4 400.40,400.42,400.43,404.0
Preservatives and artifical sweeteners for foods	892.
Preservatives, wood	400.40,400.42,400.43,801.3
Preserve jars	955.4
Preservers, life, belt type	797.2
jacket type	797.2
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negative, X-ray	494.
pneumatic life vest	797.2
Preserves, fruit	134.52,134.55
Preserving kettles	612.3,614.9,831.9
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Press, drill	762.1
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photographic dry mounting	911.9
printing	788.
proof (print shop)	788.
Press cloth, hair	365.98
Press rollers, cylinder	788.
Pressboard	472.36
Pressboard file folders	494.
Pressed cottonseed	112.3
Pressed felt	365.98
Pressed peanuts	112.2
Presser, cork	616.99
Presses, dry cleaning	787.
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wool (tailor shop)	787.
Pressure altimeters	724.26
Pressure containers (ship)	700.,703.0
Pressure cookers	614.9
Pressure demand oxygen maintenance kits	958.2
Pressure gage connections, automobile	722.33
Pressure gages	615.82,703.0,724.26,724.29,793.2
Pressure measurement	703.0,917.2
Pressure piping	807.0
Pressure process of wood preservations	400.42
Pressure reducers	807.8
Pressure regulators, gas appliance, domestic	814.2,997.2
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Pressure table for airspeed indicators	724.26
Pressure testing of metals	600.1
Pressure treatment of poles	400.42
Pressure treated lumber	400.40,518.50
Pressure valves	807.8
Pressure vessels, fired	703.0
unfired	605.20
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Prestolite torch	918.4
Prickers, sailmakers	619.99
Prickly ash (medicinal)	818.29,816.56,818.34
Prickly pear (medicinal)	816.89
Primary batteries	712.1
Primary cells	712.1
Primary switch cubicle	715.12
Primer, asphaltic	505.18
Primer, paint	844.4
Primer electrical connection, aircraft	724.22
Priming material, bituminous	505.16,505.38
Priming paints	844.4
Print cloth	306.35
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Printer, azimuth circle	788.
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Printer oiled perforated tape	475.9
Printer unit, telegraph	718.11
Printers blankets	369.23
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Printing paper	475.5,475.72
Printing plates	651.6,651.9,788.
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Printing telegraph equipment	718.1
Prints, cotton	308.35
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Prism glass	521.5
Prismatic binoculars	914.2
Prismatic compass	919.3
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Private fire brigades	970.
Privy, sanitary	412.3
Prize medals	646.59,862.
Probe, surgical	915.29
Procaine hydrochloride (novocaine)	811.,818.49,819.82
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Processing fabrics (mildew and water repellent)	310.0
Processing tank, film	956.2
Procto-sigmoidoscope	915.29
Produce (lug) boxes	953.35
Producers, gas	756.
Professional football standards	943.1
Projectile rubber gaskets	707.13
Projectile stock steel bars	821.31
Projection apparatus	912.
Projection equipment	788.
Projection glass for projection trainer	526.9
Projection printer	912.
Projection reels, motion picture	912.
Projection room plans	518.50
Projection screens and accessories	912.
Projector aperture, motion picture	912.
Projector boresight kit	958.2
Projector lenses, motion picture	912.
Projector release control	724.25
Projector sprockets, motion picture	912.
Projectors, bomb spotting	912.
electric light	716.2,716.30
film	911.9,912.
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Prong binders	932.8
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Proof press (print shop)	788.
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Propeller blades	822.9,631.9,724.24
Propeller blank, compressed wood	724.24
Propeller governors	724.24
Propeller hubs	724.24
Propeller reduction gear control	724.24
Propeller shaft cap and ends	724.24
Propeller shaft couplings, marine	725.3
Propeller shaft mounting, automobile truck	722.34
Propeller spinners	724.24
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Prostatic tractor	915.29
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Protective goggles..... 914.5
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  tomato, canned..... 128.7
  wood.....400.5, 400.50
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Pulp canal cleaner, dental..... 915.19
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Queen's delight (medicinal)	818.19
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Quicklime	511.2, 517.2, 833.5
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pan	614.9
pen or pencil	932.3
portable pan	614.9
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stock-truck, demountable	722.39
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Radar catalogs	481., 718.60
Radar equipment handbook	481.
Radial drills	711.24
Radiant heaters, electric	717.1
Radiation estimates for various types of construction	614.4, 792.0
Radiator bronzing brushes	982.2
Radiator coolant	724.20
Radiator dust brushes	982.3
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Radiator traps	703.9
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Radio antennas	718.81, 718.63
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Radio equipment bag	957.19
Radio equipment handbook	461.
Radio filter (audio-frequency)	716.69
Radio frequency, artificial line (emergency)	718.60
Radio frequency cable	715.41
Radio frequency generator	711.10
Radio frequency thermocouple converters	713.2
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Radio handsets and headsets	716.69
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Radio-telephone equipment, portable	718.65
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Radio tube tester	716.65
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Radiobeacon	718.60
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Radiographic inspection of metals	600.1
Radiography table	915.36
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Radish (medicinal)	818.19
Radishes	123.6
Radium in drugs	810.
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